STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES AND EMISSION GUIDELINES FOR EXISTING SOURCES: SEWAGE SLUDGE INCINERATION UNITS

SUMMARY OF PUBLIC COMMENTS AND RESPONSES

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Emission Standards Division
Research Triangle Park, North Carolina 27711

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1.0 INTRODUCTION

On October 14, 2010, EPA proposed New Source Performance Standards for new units (NSPS) and Emission Guidelines for existing units (EG) for sewage sludge incineration units. This document contains summaries of the public comments that EPA received on the proposed standards. In this document, EPA responds to the public comments. The public comments and EPA responses document the basis for revisions made between the proposal on October 14, 2010, and the subsequent final rules. Copies of all comments submitted are available at the EPA docket Center Public Reading Room. Comment letters and transcripts of the public hearings are also available electronically through *http://www.regulations.gov* by searching Docket ID *EPA-HQ-OAR-2009-0559.*

2.0 LIST OF COMMENTERS

The EPA received 90 comment letters on the proposed Standards of Performance for New Stationary Sources (NSPS) and Emission Guidelines for Existing Sources (EG): sewage sludge incineration units, before the comment period closed on November 29, 2010. Comments from a public hearing held on November 15 are also included in this document. All comments are contained in Docket EPA-HQ-OAR-2009-0559. The commenter, affiliation, and item number in Docket EPA-HQ-OAR-2009-0559 is listed in Table 1. A list of acronyms and units of measure used in this document appears after the list of commenters.

Table 2-1. Public Comments Received by November 29, 2011 for Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units, Proposed Rule Docket EPA EPA-HQ-OAR-2009-0559

Commenter Identification Code	Commenter and Affiliation
EPA-HQ-OAR-2009-0559-0048.1	Bob Bandarra, Department of Public Works, City of Bellingham, Washington
EPA-HQ-OAR-2009-0559-0049.1	S. Greenwood
EPA-HQ-OAR-2009-0559-0051.1	David J. Shaw, Director, Air Resources Division, New York State Department of Environmental Conservation (NYSDEC)
EPA-HQ-OAR-2009-0559-0052.1	Rich Raiders, Environment and Sustainable Development Department, Arkema Inc.
EPA-HQ-OAR-2009-0559-0053.1	Ashok K. Jain, Southern Regional Manager, National Council for Air and Stream Improvement, Inc. (NCASI)
EPA-HQ-OAR-2009-0559-0054.1	John A. Cooper, Ph.D., President, Aaron C. Siemers, Environmental Specialist, and Andrea L. Geiger, Environmental Specialist; Cooper Environmental Services, LLC (CES)
EPA-HQ-OAR-2009-0559-0055	Robert R. Scott, Director, Air Resources Division, State of New Hampshire Department of Environmental Services (NHDES)
EPA-HQ-OAR-2009-0559-0056.1	Stanley J. Chilson, Senior Project Manager, CET Engineering Services
EPA-HQ-OAR-2009-0559-0057	Darryl Sanderson, The Dow Chemical Company
EPA-HQ-OAR-2009-0559-0058.1	Robert Androsiglio, Division Superintendent, Township of Wayne, N.J. Mountain View Water Pollution Control Division (WPCF)
EPA-HQ-OAR-2009-0559-0059.1	Darryl Sanderson, EH&S Global Regulatory Affairs, The Dow Chemical Company
EPA-HQ-OAR-2009-0559-0060.1	John A. Cooper, President, Cooper Environmental Services LLC (CES)
EPA-HQ-OAR-2009-0559-0061.1	Mark Premo, General Manager, Anchorage Water and Wastewater Utility (AWWU)
EPA-HQ-OAR-2009-0559-0062.1	Robert Androsiglio, Division Superintendent, Water Pollution Control Division, Township of Wayne, New Jersey

Commenter Identification Code	Commenter and Affiliation
EPA-HQ-OAR-2009-0559-0063.1	Jerry N. Johnson, General Manager and CEO, Washington Suburban Sanitary Commission(WSSC)
EPA-HQ-OAR-2009-0559-0064.1	Nancy Wittenberg, Assistant Commissioner, Climate and Environmental Management, New Jersey Department of Environmental Protection (NJDEP)
EPA-HQ-OAR-2009-0559-0065.1	Louis T. Barry, President, Chavond-Barry Engineering Corporation (CBE)
EPA-HQ-OAR-2009-0559-0066.1	Stephen R. Gossett, Senior Environmental Associate, Eastman Chemical Company
EPA-HQ-OAR-2009-0559-0067.1	Brian W. Arnet, Executive Director, Mattabassett District Water Pollution Control Facility (WPCF), Mattabassett District Regional Sewer Authority, Connecticut
EPA-HQ-OAR-2009-0559-0068.1	Thomas K. Walsh, Engineer Director and Treasurer, Upper Blackstone Water Pollution Abatement District (UBWPAD)
EPA-HQ-OAR-2009-0559-0069.1	Jim Larkin, Director, Unified Government of Wyandotte County/Kansas City, KS, (UG)
EPA-HQ-OAR-2009-0559-0070.1	Howard Hurwitz, Executive Director, Northwest Bergen County Utilities Authority (NBCUA)
EPA-HQ-OAR-2009-0559-0071.1	Mark A. Haley, Director, Hopewell Regional Wastewater Treatment Facility (HRTWTF) Commission, Hopewell Regional Wastewater Treatment Facility (HRTWTF), City of Hopewell, Virginia
EPA-HQ-OAR-2009-0559-0072.1	John D. Reece, Executive Director, Little Blue Valley Sewer District (LBVSD)
EPA-HQ-OAR-2009-0559-0073.1	Layne Baroldi, Regional Vice President of Project Development, Synagro Technologies, Inc.
EPA-HQ-OAR-2009-0559-0074.1	Robert Patten, Assistant Director, Water Pollution Control, City of Independence, Missouri
EPA-HQ-OAR-2009-0559-0075.1	Arthur M. Tamilia, Esq., Director of Environmental Compliance, Allegheny County Sanitary Authority (ALCOSAN), Pittsburgh, Pennsylvania
EPA-HQ-OAR-2009-0559-0076.1	Margaret P. Orr for James M. Kelly, P.E., General Manager, Central Contra Costa Sanitary District (CCCSD), Martinez, California
EPA-HQ-OAR-2009-0559-0076.2	Margaret P. Orr for James M. Kelly, P.E., General Manager, Central Contra Costa Sanitary District (CCCSD), Martinez, California
EPA-HQ-OAR-2009-0559-0077.1	Alan B.Rubin, Ph.D., Envirostrategies, LLC
EPA-HQ-OAR-2009-0559-0078.1	James Sizemore, Manager, Regulatory Compliance, Alexandria Sanitation Authority (ASA)
EPA-HQ-OAR-2009-0559-0079.1	G. Vinson Hellwig and Robert H. Colby, Co-Chairs, Air Toxics Committee, National Association of Clean Air Agencies (NACAA)
EPA-HQ-OAR-2009-0559-0080.1	Kathleen A. Luvisi, Project Engineer, Alternative Resources, Inc. on behalf of Borough of Naugatuck, Connecticut
EPA-HQ-OAR-2009-0559-0081.1	Robert W. Bush, P.E., Senior Director, Department of Watershed Management, City of Atlanta, Georgia
EPA-HQ-OAR-2009-0559-0082.1	Ronald Poltak, Executive Director, New England Interstate Water Pollution Control Commission (NEIWPCC)

Commenter Identification Code	Commenter and Affiliation
EPA-HQ-OAR-2009-0559-0083.1	Lisa Ochsenhirt, Attorney, AquaLaw on behalf of the Maryland Association of Municipal Wastewater Agencies, Inc. et al.
EPA-HQ-OAR-2009-0559-0084.1	Earthjustice, Sierra Club, Friends of the Earth
EPA-HQ-OAR-2009-0559-0085.1	James S. Allen, Manager, Water Quality Control Plant and Phil Bobel, Manager, Environmental Compliance, Public Works Department, City of Palo Alto, California
EPA-HQ-OAR-2009-0559-0086.1	Ted Michaels, President, Energy Recovery Council (ERC)
EPA-HQ-OAR-2009-0559-0086.2	Ted Michaels, President, Energy Recovery Council (ERC)
EPA-HQ-OAR-2009-0559-0087.1	Tatyana Arsh, Director, Department of Public Utilities (DPU), City of Columbus, Ohio
EPA-HQ-OAR-2009-0559-0088.1	Gregory M. Adams, Assistant Departmental Engineer, Air Quality Engineering, Technical Services Department, Los Angeles County Sanitation Districts
EPA-HQ-OAR-2009-0559-0089.1	Steven A. Hann, Hamburg, Rubin, Mullin, Maxwell & Lupin, P.C. on behalf of Hatfield Township Municipal Authority
EPA-HQ-OAR-2009-0559-0090.1	Dr. James J. Pletl, Technical Services Division, Hampton Roads Sanitation District (HRSD)
EPA-HQ-OAR-2009-0559-0091.1	Russell Frye, SSM Coalition
EPA-HQ-OAR-2009-0559-0092.1	Alice Edwards, Acting Director, Air Quality Division, Alaska Department of Environmental Conservation (ADEC)
EPA-HQ-OAR-2009-0559-0093.1	Brian K. Carlson, Director of Public Works, City of Vancouver, WA
EPA-HQ-OAR-2009-0559-0094.1	Robert C. Fischer, Executive Director, Bayshore Regional Sewerage Authority (BRSA)
EPA-HQ-OAR-2009-0559-0095.1	Melvin E. Keener, Ph.D., Executive Director, Coalition for Responsible Waste Incineration (CRWI)
EPA-HQ-OAR-2009-0559-0095.2	Melvin E. Keener, Ph.D., Executive Director, Coalition for Responsible Waste Incineration (CRWI)
EPA-HQ-OAR-2009-0559-0096.1	Jeffrey Theerman, P.E., Executive Director, Metropolitan St. Louis Sewer District (MSD), Missouri
EPA-HQ-OAR-2009-0559-0097.1	Ken Kirk, Executive Director, National Association of Clean Water Agencies (NACWA) Attachments C and D.
EPA-HQ-OAR-2009-0559-0098.1	Ken Kirk, Executive Director, National Association of Clean Water Agencies (NACWA) Attachment A
EPA-HQ-OAR-2009-0559-0099.1	Ken Kirk, Executive Director, National Association of Clean Water Agencies (NACWA) Attachment B
EPA-HQ-OAR-2009-0559-0100.1	Lorraine Krupa Gershman, Director, American Chemistry Council (ACC)
EPA-HQ-OAR-2009-0559-0101.1	Karl E. Monninger, Vice President, Chavond-Barry Engineering Corp. (CBE) on behalf of Thomas Lauletta, Vice President, Wastewater Division, Atlantic County Utilities Authority
EPA-HQ-OAR-2009-0559-0102.1	John Kiviniemi, Director, Water Reclamation, Metropolitan Sewerage District of Buncombe County, North Carolina
EPA-HQ-OAR-2009-0559-0103.1	William G. Moore, General Manager, Metropolitan Council Environmental Services (MCES)
EPA-HQ-OAR-2009-0559-0104.1	Alice Edwards, Acting Director, Division of Air Quality, Alaska Department of Environmental Conservation (ADEC)

Commenter Identification Code	Commenter and Affiliation
EPA-HQ-OAR-2009-0559-0105.1	Sally Keating, Manager, Environment Health and Safety, The Metropolitan District (MDC)
EPA-HQ-OAR-2009-0559-0106.1	James A. Parrott, Executive Director, Metorpolitan Sewer District of Greater Cincinnati (MSDGC)
EPA-HQ-OAR-2009-0559-0107.1	John Franz, Manager, Wastewater Treatment Plant, City of Anacortes, Washington
EPA-HQ-OAR-2009-0559-0108.1	Caroline Quinn, P.E., Project Manager, Delta Diablo Sanitation Districton behalf of Bay Area Biosolids to Energy Project
EPA-HQ-OAR-2009-0559-0109.1	David R. Sherman, Director, City of Indianapolis, Department of Public Works
EPA-HQ-OAR-2009-0559-0110.1	Greg Kester, Biosolids Program Manager, California Association of Sanitation Agencies (CASA)
EPA-HQ-OAR-2009-0559-0111.1	Steve Koho, Plant Manager, City of Edmonds, WA
EPA-HQ-OAR-2009-0559-0112.1	Tatyana Arsh, Director, City of Columbus, Ohio, Department of Public Utilities (DPU)
EPA-HQ-OAR-2009-0559-0113.1	Randolph W. Bartlett, Director Stormwater and Wastewater Management, Fairfax County Wastewater Treatment Division (FCWTD)
EPA-HQ-OAR-2009-0559-0114.1	Gary Zrelak, Director of Operations, Greater New Haven Water Pollution Control Authority (GNHWPCA)
EPA-HQ-OAR-2009-0559-0115.1	Stephen L. Hershner, Utilities Environmental Manager, Cedar Rapids Water Pollution Control Facilities (CRWPCF)
EPA-HQ-OAR-2009-0559-0116.1	Donald B. Howard, Water Reclamation Manager, Department of Water Resources, City of Greensboro, North Carolina
EPA-HQ-OAR-2009-0559-0117.1	John C. Ewell III, P.E., Treatment Plant Supervisor, Public Works Department, City of Lynwood, Washington
EPA-HQ-OAR-2009-0559-0118.1	Joseph L. Salvucci, Executive Director, Delaware County Regional Water Quality Control Authority (DELCORA)
EPA-HQ-OAR-2009-0559-0119.1	Earthjustice, Sierra Club, and Friends of the Earth
EPA-HQ-OAR-2009-0559-0120.1	Thomas W. Sigmund, Executive Director, Green Bay Metropolitan Sewerage District (GBMSD)
EPA-HQ-OAR-2009-0559-0121.1	Michael J. Quinn, Deputy Commissioner, Erie County Division of Sewerage Management (ECDSM)
EPA-HQ-OAR-2009-0559-0122	Peter Dorney, Executive Director, Hatfield Township Municipal Authority
EPA-HQ-OAR-2009-0559-0123	Timothy A. Boyd, Executive Director, East Norriton Plymouth Whitpain Joint Sewer Authority (JSA)
EPA-HQ-OAR-2009-0559-0124.1	Douglas L. McVay, Acting Chief, Office of Air Resources, Rhode Island Department of Environmental Management (RIDEM)
EPA-HQ-OAR-2009-0559-0125	Jim Sullivan, Principal, Biosoils
EPA-HQ-OAR-2009-0559-0126.1	Susan M. Whittaker, Maraziti, Falcon & Healey, LLP on behalf of John Kantorek, Executive Director, Stony Brook Regional Sewerage Authority (SBRSA)
EPA-HQ-OAR-2009-0559-0127.1	Chris Hornback, Senior Director, Regulatory Affairs, National Association of Clean Water Agencies (NACWA)
EPA-HQ-OAR-2009-0559-0127.2	Chris Hornback, Senior Director, Regulatory Affairs, National Association of Clean Water Agencies (NACWA)
EPA-HQ-OAR-2009-0559-0127.3	Chris Hornback, Senior Director, Regulatory Affairs, National Association of Clean Water Agencies (NACWA)

Commenter Identification Code	Commenter and Affiliation
EPA-HQ-OAR-2009-0559-0128.1	John Kivinlemi, Chair, North Carolina American Water Works Association (NCAWWA) and North Carolina Water Environment Association (NCWEA)
EPA-HQ-OAR-2009-0559-0129.1	Julius Ciaccia, Executive Director, Northeast Ohio Regional Sewer District (NEORSD)
EPA-HQ-OAR-2009-0559-0130.1	Bill Thompson, National Tribal Air Association Executive Committee Chairperson and Tribal Vice-Chief, Penobscot Nation, National Tribal Air Association (NTAA)
EPA-HQ-OAR-2009-0559-0131.1	Glenn B. Harvey, Prince William County Service Authority (PWSCA)
EPA-HQ-OAR-2009-0559-0132.1	Larry R. Thomas, Executive Director, Ypsilanti Community Utilities Authority (YCUA)
EPA-HQ-OAR-2009-0559-0133.1	Dick Munson, Senior Vice President, Recycled Energy Development (RED)
EPA-HQ-OAR-2009-0559-0134.1	Tim Williams, Senior Managing Director, Public Policy, Water Environment Federation (WEF)
EPA-HQ-OAR-2009-0559-0135.1	Glenn T. Almquist, Senior Vice President, Woodard & Curran
EPA-HQ-OAR-2009-0559-0136.1	Barry G. Parks, Assistant Director of Public Services / Water Resources, City of Wilson, North Carolina
EPA-HQ-OAR-2009-0559-0137.1	Melissa Hamkins, Senior Project Manager, Wright-Pierce
EPA-HQ-OAR-2009-0559-0137.2	Melissa Hamkins, Senior Project Manager, Wright-Pierce
EPA-HQ-OAR-2009-0559-0137.3	Melissa Hamkins, Senior Project Manager, Wright-Pierce
EPA-HQ-OAR-2009-0559-0137.4	Melissa Hamkins, Senior Project Manager, Wright-Pierce
EPA-HQ-OAR-2009-0559-0138	United States Environmental Protection Agency Public Hearing 40 CFR Part 60 Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units; Proposed Rule
EPA-HQ-OAR-2009-0559-0138.3	USEPA Public Hearing 129 Sanitary Sewer Incinerator Rule
EPA-HQ-OAR-2009-0559-0138.4	City of Greensboro - USEPA Public Hearing
EPA-HQ-OAR-2009-0559-0138.5	Public Hearing on Proposed Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units (Testimony of Robert P. Dominak)
EPA-HQ-OAR-2009-0559-0138.6	Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units (SSIs)
EPA-HQ-OAR-2009-0559-0138.7	Public Hearing on Proposed Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units
EPA-HQ-OAR-2009-0559-0138.8	John Sprague, Director of Operations, Metropolitan St. Louis District, USEPA Public Hearing
EPA-HQ-OAR-2009-0559-0144	Georgia Department of Natural Resources
EPA-HQ-OAR-2009-0559-0145.1	Carlson Associates Technical Services INC

List of Acronyms and Abbreviations

Acronyms

ACC	American Chemistry Council
AN	Acrylonitrile
ANPRM	Advanced Notice of Proposed Rulemaking
ATSDR	Agency for Toxic Substances and Disease Registry
CAA	Clean Air Act
CMPUs	SOCMI chemical manufacturing process units
EPA	U. S. Environmental Protection Agency
FR	Federal Register
GACT	generally available control technology
HAP	hazardous air pollutants
HI	Hazard Index
HON	hazardous organic NESHAP
HQ	hazard quotient
IDLH/10	imminently dangerous to life and health
IRIS	Integrated Risk Information System
LDAR	detection and repair
MACT	maximum achievable control technology
MON	Miscellaneous organic NESHAP
NEI	National Emissions Inventory
NESHAP	national emission standards for hazardous air pollutants
NSR	new source review
NTP	National Toxicology Program
OLD	Organic Liquid Distribution
ppmv	parts per million by volume
RCRA	Resource Conservation and Recovery Act
RFC	reference concentration
SIC	Standard Industrial Classification
SOCMI	Synthetic Organic Chemical Manufacturing Industry
SSMP	startup, shutdown, and malfunction plan
TERA	Toxicology Excellence for Risk Assessment
VOC	volatile organic compounds

3.0 APPLICABILITY OF THE STANDARDS AND EMISSION GUIDELINES

3.1 Exemptions

Comment: Several commenters (51.1, 86.1, 110.1, 129.1) were concerned that other solid waste incineration unit designs could be considered SSI units and subject to the proposed sewage sludge incineration standards if they combust any amount of sewage sludge. One commenter (86.1) stated that the definition of an SSI unit in the proposed sewage sludge incineration standards does not explicitly limit units to only FB and MH SSI unit designs, nor does the definition require a minimum amount of sewage sludge be combusted to be considered a SSI unit. One commenter (51.1) expressed concern about how municipally owned SSI units combusting both sewage sludge and non-sludge commercial industrial wastes, which is typically not treated, would be regulated. The commenter (51.1) asked whether such a facility would be subject to both the proposed SSI requirements and the CISWI requirements. Two commenters (86.1, 92.1, 104.1) stated that EPA should exempt co-fired combustors from the proposed sewage sludge incineration standards. The commenters (86.1, 92.1, 104.1) mentioned that the term "co-fired combustor" is defined, but is never used anywhere in the proposed sewage sludge incineration standards (except in the definition sections).

Other commenters (86.1) suggested that an upper limit be placed on the amount of sewage sludge that could be co-fired and still meet the exemption. One commenter (110.1) suggested EPA include a de minimis limit on the mass of sewage sludge combusted in a unit before being covered by the proposed sewage sludge incineration standards. At least one commenter (92.1, 104.1) specifically requested that small co-fired combustors with charge rates under 1000 kg/day be explicitly exempted from the proposed sewage sludge incineration standards. The commenter (92.1, 104.1) emphasized remote mining camps in Alaska could face significant financial and logistical hardships to dispose of their waste; these camps use co-fired incinerators to dispose of 10 percent or less sewage sludge with charging rates under 1000 kg/day, and do not have alternative sludge disposal options. The commenter (92.1, 104.1) added these sources are exempt from 40 CFR 60 Subpart O.

Two commenters (86.1, 129.1) suggested the exemption be units firing 30% or less by weight, which is consistent with the co-fired combustor definition contained in MWC Section 129 rules. One of these commenters (86.1) contended that because sewage sludge has a high

moisture content and its heating value is low, a 10% limit by weight would effectively limit firing to a much lower fraction of total heat input, providing little incentive for operators to make any physical and permitting modifications necessary to accept sewage sludge. One commenter (90.1) specifically responded to EPA's solicitation for comments on whether sewage sludge that is incinerated in combustion units located at commercial and industrial facilities be subject to the CISWI standards instead of the SSI standards. The commenter (90.1) states that there currently are no commercial and industrial facilities that are burning sewage sludge in their incinerators. The commenter (90.1) suggested that EPA use language similar to that of the Part 503 regulations, which state that if municipal solid waste is utilized as an auxiliary fuel in a sewage sludge incinerator, that the waste cannot exceed 30% of the dry weight of the sewage sludge and the auxiliary fuel together, and that if the 30% threshold is exceeded, the incinerator will be regulated as a solid waste incinerator. The commenter (90.1) further notes that pelletized sewage sludge is burned as an auxiliary fuel in cement kilns, and that operators for other industries have considered sewage sludge as an auxiliary fuel. The commenter (90.1) suggests that, in these cases, if the 30% threshold is not exceeded, then the cement kiln rule or other applicable rule should apply.

Several commenters (52.1, 66.1, 95.1, 100.1, 57, 59) contended that EPA should exempt incineration units subject to hazardous waste combustor regulations and/or hazardous waste management permits issued under the Solid Waste Disposal Act from the proposed sewage sludge incineration standards. These commenters (52.1, 66.1, 95.1, 100.1, 57, 59) emphasized that the CAA section 129(g)(1) states that a solid waste incineration unit does not include incinerators or other units required to have a permit under section 3005 of the SWDA. The commenters (52.1, 66.1, 95.1, 100.1, 57, 59) requested EPA include the four statutory exclusions, and particularly the exclusion for units which are required to have a permit under section 3005 of the Solid Waste Disposal Act. Additionally, four of these commenters (52.1, 66.1, 95.1, 57, 59) requested EPA include an exemption for hazardous waste combustion units that are affected sources under 40 CFR 63 Subpart EEE.

One commenter (86.1) suggested that EPA should extend the proposed Section 60.4780 and Section 60.5065 exclusions to all solid waste incineration units that meet the applicability requirements of other Section 129 NSPS and EG rules, including MWCs regulated under Subparts Ea, Eb, Cb, AAAA, and BBBB. The commenter (86.1) stated that this exemption would be consistent with EPA's proposed CISWI NSPS and EG rules which explicitly exempt

MWC units subject to these other Section 129 rules (75 FR 31974, Section 60.2020(c); 75 FR 31990, Section 60.2555(c)).

Response: Section 129 defines solid waste incineration unit to include any unit combusting any solid waste. Section 129(g)(1) clarifies that the term 'solid waste incineration unit,' does not include incinerators or other units required to have a permit under section 3005 of the Solid Waste Disposal Act [42 U.S.C.A. § 6925]. The term 'solid waste incineration unit,' does not include (A) materials recovery facilities (including primary or secondary smelters) which combust waste for the primary purpose of recovering metals, (B) qualifying small power production facilities, as defined in section 796(17)(C) of Title 16, or qualifying cogeneration facilities, as defined in section 796(18)(B) of Title 16, which burn homogeneous waste (such as units which burn tires or used oil, but not including refuse-derived fuel) for the production of electric energy or in the case of qualifying cogeneration facilities which burn homogenous waste for the production of electric energy and steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes, or (C) air curtain incinerators provided that such incinerators only burn wood wastes, yard wastes and clean lumber and that such air curtain incinerators comply with opacity limitations to be established by the Administrator by rule. Those units that are exempt from the definition of solid waste incineration unit under the Act are not subject to the SSI standards.

EPA is not establishing de minimus levels of solid waste that can be burned in incinerators but not subject to the SSI standards. The CAA defines solid waste incineration unit to mean any unit combusting *any* solid waste, and EPA does not believe that a de minimis exemption is appropriate where a unit is combusting some solid waste. Therefore, any amount of sewage sludge combusted in an incinerator located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to the final SSI standards. In the proposed rules, we had inadvertently left in a definition for co-fired combustor. However, the definition was not used in the rule and we did not propose any requirements for co-fired combustor. This definition has been removed from the final rules.

We have clarified that the final standards and guidelines only apply to sewage sludge that is burned in an SSI located at a wastewater treatment facility designed to treat domestic sewage sludge. Sewage sludge that is not burned in an SSI located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to other section 129 standards, such as the CISWI standards (40 CFR part 60, subparts CCCC and DDDD of this part), the OSWI standards

(40 CFR part 60, subparts EEEE and FFFF), the MWC standards (40 CFR part 60, subparts Ea, Eb, Cb, AAAA, and BBBB of this part) or the Hazardous Waste Combustor rule (40 CFR part 63 subpart EEE).

Hazardous waste combustion units that are required to have a permit under CAA section 3005 or the Solid Waste Disposal Act are exempt from CAA section 129 standards per CAA section 129(g)(1), therefore we do not believe an exemption is needed for this rule.

Comment: Two commenters (110.1, 92.1, 104.1) were concerned that the definition of SSI units in §60.5250 is not specific enough. One commenter (110.1) stated that there is confusion as to whether gasification units are covered by the proposed sewage sludge incineration standards because there is no mention of gasification in the preamble or proposed rule. The commenter (110.1) suggested that the proposed sewage sludge incineration standards include a non-applicability section in which it explicitly states that no other biosolids management options (ie, land application, landfilling, surface disposal, thermal drying, etc.) are affected by this action. The commenter (110.1) also stated that there should be an applicability section of the rule to state what exactly is covered by the regulation. Another commenter (92.1, 104.1) requested that EPA either more closely define SSI units under §60.5250 to explicitly include or exclude stack evaporation, or add an exemption under §60.5065 for flash evaporation units. The commenter (92.1, 104.1) stated that it is unclear whether the definition of SSI unit in §60.5250 is meant to include flash evaporation units that use stack-injection in a gas turbine's exhaust to flash evaporate sewage sludge. At least one commenter (88.1) stated that the rule should include a definition of "combustion" as an oxidative process. The commenter (88.1) noted that this definition is necessary to distinguish it from gasifying operations, such as the ones used in biosolids-to-diesel fuel programs. The commenter requested that, alternatively, EPA should clarify that gasifiers are unequivocally excluded from the regulations.

Response: We have revised the definition of sewage sludge to clarify that methods of sewage sludge disposal other than combustion are not subject to the SSI standards. We have also clarified that this action does not address other methods of disposal for sewage sludge (e.g. land application, landfilling, surface disposal,fertilizer). EPA has clarified in the final rule that sewage sludge that is not burned in an SSI unit located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to other section 129 standards, such as the CISWI standards (40 CFR part 60, subparts CCCC and DDDD of this part), the OSWI standards (40 CFR part 60, subparts EEEE and FFFF), the MWC standards (40 CFR part 60, subparts Ea, Eb,

Cb,AAAA, and BBBB of this part) or the Hazardous Waste Combustor rule (40 CFR part 63 subpart EEE). Facilities that are unsure if their process is a combustion process, are welcome to submit a formal applicability determination to the Agency.

Comment: One commenter (76.1) requested that improvements to existing MH incinerators to meet the new MH emission guidelines be specifically exempt from NSR and Subpart LLLL: New FBI Units.

Response: EPA has revised the proposed rule to subcategorize new units into two subcategories, as explained elsewhere in this document. Therefore, new MH units are a separate subcategory from new FB units. Today's action does not address or affect any requirements that may apply under NSR.

3.2 Definition of Modification

Comment: Several commenters (96.1, 109.1, 134.1) requested clarification regarding the definition of "modification". One commenter (134.1) requested clarification regarding whether the "modification" (which refers to an "SSI unit") applies to the multiple hearth or fluid bed "reactor" or whether it includes the entire system including all air emission controls and auxiliary equipment. Other commenters (109.1) noted that 40 CFR 60.14 (e)(5) specifically states that addition of pollution control equipment to reduce emissions is not considered a "modification" and does not trigger the new source rules. One commenter (109.1) stated that the EPA should also address whether or not the existing NSR provisions for "Pollution Control Project" exclusions will also be incorporated in these proposed 129 rules that allows for sources to install new emission control equipment without triggering the "new source" designation. At least one commenter (76.1) requested that EPA clarify that existing SSIs that make modifications to meet the limits do not constitute a "major modification" under Title V and are not subject to NSR and the NSPS (Section LLLL) for new SSIs.

Other commenters (109.1, 134.1) requested clarification on what is included in the 50% cost rule determination; one commenter (109.1) stated that the inclusion of the words "cumulative cost of the changes over the life of the unit" is not consistent with what has been used previously with other NSPS and NSR rule language regarding the "modification" cost determinations, which do not include the "cumulative" designation. One commenter (96.1) requested that EPA clarify the definition of modification to mean greater than 50% of the cost of a new or replacement SSI fluidized bed unit in today's dollars. The commenter (96.1) stated that

even if advanced emission controls were not counted towards the 50% cost threshold, the costs for needed improvements for a facility may easily exceed the 50% threshold amount. One commenter (76.1) suggested that Section 60.5060 of Subpart LLLL should be revised to state that construction started after the compliance deadline (not 6 months after the promulgation of the final rule) could be considered a modification if the cost is more than 150% of the replacement costs of existing SSI in current dollars. Another commenter (134.1) requested that only modification costs required to comply with the proposed rule be included, and that routine maintenance or "in-kind" replacement costs be excluded.

Other commenters (97.1 and 127.1) suggested that EPA ignored the "modification" trigger for the new source standards because EPA's proposed definition of "modification" could make existing MH SSIs subject to the new source FB based standards. The commenters (97.1 and 127.1) state that EPA would impose the new standards on units for which the "cumulative cost of the changes over the life of the unit exceeds 50 percent of the original cost of building and installing the SSI unit." The commenters (97.1 and 127.1) urged EPA to make clear in the final SSI rule that the cumulative costs to be considered are only those costs incurred since the effective date of the final SSI rule since this is the approach taken in the Municipal Waste Combustor § 129 rule at 40 CFR § 60.51b. The commenter (97.1 and 127.1) is concerned that the "life of the unit" reference in the definition of modification could be misconstrued as a retroactive evaluation of incurred costs that pre-date the rule.

Several commenters (101.1, 102.1, 109.1) contended that the proposed new source performance standards would severely restrict or discourage a POTWs from modifying an existing MH incinerator, including modifications to improve combustion efficiency, boost steam output for electricity generation, or modernize emission control equipment. The commenters (102.1) added that the term "modifications" as utilized in the proposed standard either needs to be clearly defined or removed because it can currently be interpreted in both wide ranging and very narrow views depending on the end goal in mind.

Response: The definition of "modification" in the proposed and final rule is consistent with the statutory definition of "modification" in Section 129(g) of the CAA. A unit becomes "modified" only by a change to an existing SSI unit that occurs later than 6 months after the date of subpart LLLL publication in the Federal Register if one of two criteria are met:

(1) The cumulative cost of the changes over the life of the unit exceeds 50 percent of the original cost of building and installing the SSI unit (not including the cost of land), updated to contemporaneous year dollars; or

(2) Any physical change in the SSI unit or change in the method of operation that increases the amount of any air pollutant emitted for which section 129 or section 111 of the CAA has established standards.

The trigger date for when a modification occurs, 6 months after publication of the final rule in the *Federal Register*, is required by section 129 of the CAA. Section specifies that the trigger date is "…after the effective date of a standard under section (a)…" of section 129. The effective date for new SSI units in section (a) is 6 months following rule publication, and therefore, is the trigger date for a modified SSI unit. However, if the cumulative costs over the life of a unit exceed the 50 percent criterion, the unit is not classified as a modified unit unless that change occurs after the effective date (i.e., 6 months after publication of this rule).

The costs to consider for determining if the 50 percent criterion is met are the costs of the combustion unit and all associated ancillary equipment, excluding air pollution control equipment. The commenter is correct that the definition of the SSI unit in the proposed rule was unclear as to what equipment constitutes the SSI unit. We have modified the definition of SSI unit in the final rule. While not all SSI units will include all of the following components, a SSI unit includes, but is not limited to, the sewage sludge feed system, auxiliary fuel feed system, grate system, flue gas system, waste heat recovery equipment, if any, and bottom ash system. The SSI unit includes all ash handling systems connected to the bottom ash handling system. The combustion unit bottom ash system ends at the truck loading station or similar equipment that transfers the ash to final disposal. The SSI unit does not include air pollution control equipment or the stack.

A commenter was incorrect in stating that the cumulative costs should be only those costs incurred after the effective date of the rule and that this rule is inconsistent with the approach taken for the Municipal Waste Combustor (MWC) section 129 rule. Section 129 clearly specifies that the cumulative costs are those incurred over the life of the unit. These costs, however, do not include maintenance, repair, or replacements that the Administrator considers to be routine for the source category, as prescribed in section 60.14(e). The definition of a modified unit in this rule is conceptually identical to the definition of modification in the MWC rule.

A commenter also is incorrect is stating that improvements to the unit to comply with the rule may exceed 50 percent and therefore trigger stringent new source requirements. Section 60.5060 states that physical or operational changes made to your SSI unit primarily to comply with the State plan prepared for subpart MMMM (Emission Guidelines and Compliance Times for Existing Sewage Sludge Incineration Units) do not qualify as a modification under this rule.

Regarding the comments that under the proposed rule the new source requirements for multiple hearth incinerators would discourage modifications for the purpose of improving energy efficiency, as explained in section 6.0 of this document, the final rule contains separate emission limits for multiple hearth combustion units improvements such that the new source requirements are reasonable and achievable.

We are making no changes to the rule regarding applicability of SSI units to the modification requirements under Title V or New Source Review (NSR) permitting. Both Title v and NSR rules address how pollution control projects are handled, and it is not within the scope of the SSI NSPS and guidelines rulemaking to revise the provisions of either of these permitting programs.

3.3 Applicability Dates

Comment: One commenter (76.1) contended that EPA should increase the compliance time from 3 to 5 years after State Plan adoption and 5 to 7 years after Federal adoption. The commenter (76.1) stated that compliance within 3 years after adoption of the State Plan or 5 years after Federal adoption is not enough time to follow standard engineering practices which may include conducting pilot studies to verify design parameters, preparing and approving environmental documents, obtaining regulatory permits, pre-design, design, value engineering, final design, prequalification of contractors, bidding and award, and finally construction. One commenter (115.1) stated that a 5-year deadline (January 2016) to meet proposed regulations could be difficult to accomplish due to FEMA flood recovery timelines and approval process.

Response: The NSPS are directly enforceable federal regulations, and under CAA section 129 (f)(1), become effective 6 months after promulgation. Under CAA section 129 (f)(2), the EG become effective and enforceable 3 years after EPA approves a state plan implementing the EG or 5 years after the date they are promulgated, whichever is sooner. The state plan must be “at least as protective as” the EG and must ensure compliance with all applicable

requirements not later than 3 years after the state plan is approved by EPA, but not later than 5 years after the relevant EG are promulgated.

The final EG requires existing SSI to demonstrate compliance with the standards as expeditiously as practicable after approval of a state plan, but no later than three years from the date of approval of a state plan or five years after promulgation of the EG, whichever is earlier. Consistent with CAA section 129, EPA expects states to require compliance as expeditiously as practicable. However, because we believe that many SSI units will find it necessary to retrofit existing emissions control equipment and/or install additional emissions control equipment in order to meet the final limits, EPA anticipates that states may choose to provide the 3-year compliance period allowed by CAA section 129(f)(2). If EPA does not approve a state plan or issue a federal plan, then the compliance date is five years from the date of the final rule.

EPA intends to develop a federal plan that will apply to existing SSI units in any state that has not submitted an approved state plan within two years after promulgation of the EG. The final EG allows existing SSI units subject to the federal plan up to five years after promulgation of the EG to demonstrate compliance with the standards, as allowed by CAA section 129(b)(3).

3.4 Definition of Solid Waste

Comment: Some commenters (83.1, 71.1, 90.1) objected to EPA's issuance of the proposed sewage sludge incineration standards because EPA has not made any determinations regarding the definition of non-hazardous solid waste in the June 4 proposed rule titled "Identification of Non-Hazardous Secondary Materials That Are Solid Waste (40 CFR Part 241)"; at least two commenters (73.1, 76.1) stated that EPA should delay any rule-making on SSIs until the definition of “solid waste" is finalized. Several commenters (71.1, 90.1, 102.1, 116.1, 102.1, 116.1, 83.1, 97.1, 127.1, 121.1) argued that sewage sludge is not a solid waste; some commenters (71.1, 90.1) argued that there is no legal basis to begin an administrative procedure to adopt standards to control emissions from sewage sludge. One commenter (83.1) recommended that EPA determine in response to the comments filed with regard to the June 4 proposed rule that sewage sludge is exempted under RCRA's DSE from Section 129 CAA regulation. At least three commenters (83.1, 97.1, 127.1) pointed out that the CAA defines solid waste by referencing the definition of solid waste under RCRA. Two of these commenters (97.1, 121.1, 127.1) argued that it is explicitly noted in the RCRA definitions that solid waste "...does not include solid or dissolved material in domestic sewage." Several commenters (83.1, 97.1,

121.1, 127.1) stated that this language expressly excludes the sewage sludge in domestic sewage from the definition of "solid waste" in what is commonly referred to as the "Domestic Sewage Exclusion" ("DSE"). The commenters (97.1, 127.1) stated that there was an early recognition that a comprehensive solid waste program, designed primarily to address hazardous wastes, did not apply to POTWs as long as they were effectively regulated under the CWA, which has always been and remains the primary statutory authority for comprehensive regulation of POTW operations. The commenters (97.1, 127.1) argued that The Solid Waste Disposal Act and RCRA included the DSE in explicit recognition of this critical policy choice [Footnote: Solid Waste Disposal Act, Pub. L. No. 89-272, § 203(4), 79 Stat. 992, 998 (1965) (defining the term "solid waste" to exclude "solids or dissolved material in domestic sewage or other significant pollutants in water resources . . . ."); accord Resource Conservation and Recovery Act, Pub. L. No. 94-580, § 1004, 90 Stat. 2795, 2801 (1976)].

Commenters (83.1) stated that although EPA concludes in its June 4 proposed rule that it has "...long viewed sewages sludge generated from POTWs as a solid waste, beginning with the 1980 Identification and Listing of Hazardous Waste rulemaking," EPA's statement is contradicted by its determination in 1990 that: "...if wastewaters generated at petroleum refineries are discharged to a POTW and such wastewaters are mixed with domestic sewage from nonindustrial sources, the sludges generated in the POTW are covered under the domestic sewage exclusion..." One commenter (97.1, 127.1) argued that sewage sludge and solid waste are different types of material because EPA's careful regulatory approach in the Part 503 regulations distinguishes between sewage sludge and solid waste. The commenter (97.1, 127.1) used the preamble to the Part 503 rules to show this distinction: "The standards also do not apply to sewage sludge that is co-incinerated with large amounts of solid waste . . . . However, the standards established in the rule do apply to sewage sludge that is incinerated in a sewage sludge incinerator with incidental amounts of solid waste use as an auxiliary fuel (i.e., 30 percent or less solid waste by weight)." [58 Fed. Reg. 9248, 9253].

Another commenter (97.1, 127.1) also pointed out that EPA had interpreted the scope of the DSE to include sewage sludge generated by POTWs in the preamble to the Agency's 1990 Final Rule to identify and list hazardous wastes for petroleum refinery process wastewaters. The commenter (83.1) stated that EPA's 1990 pretreatment regulation also strongly suggests that sewage sludge is covered by the DSE. The commenter (97.1, 127.1) stated that there has been a clear recognition for over 30 years that sewage sludge is different than solid waste for regulatory

purposes, and that sewage sludge is primarily regulated under the CWA, not RCRA. Other commenters (76.1) argued that sludge from a wastewater treatment plant is not a hazardous waste and should not be regulated as one. The commenters (76.1) argued that to regulate sludge from a WWTP as hazardous waste would be a waste of public money and resources and requested EPA to write the regulation for the wastewater industry. Commenters (83.1) further stated that it would be illogical for EPA to laud its CWA Part 503 sewage sludge regulations as a method for addressing the proper treatment of DSE materials, but then refuse to define sewage sludge as a DSE material. The commenter (83.1) requested EPA issue a final regulation finding that sewage sludge is not a solid waste per the RCRA definition, thereby releasing POTWs from any obligations to comply with CAA section 129. The commenter (83.1) stated that POTWs that manage sewage sludge materials are highly regulated under EPA's Part 503 CWA regulations.

One commenter (111.1) argues that EPA's proposed rule is incorrectly based on the determination that biosolids are a solid waste because it conflicts with two Washington State policies: that sewage sludge and biosolids are not a solid waste, and that there are regulations in place to restrict landfilling of sewage sludge. The commenter (111.1) encouraged EPA to consider the classification of biosolids as solid waste in light of determinations from State and Federal environmental agencies.

Conversely, one commenter (77.1) supported the proposed EPA position to classify sewage sludge as a solid waste and establish emission standards for sewage sludge incinerators under Section 129 of the Clean Air Act. The commenter (77.1) stated that Section 405(d) of the Clean Water Act directed EPA to establish standards for all of the common sewage sludge management options including land application, surface disposal, and incineration under the Part 503 Rule; however, the promulgation of that rule did not change the status of sewage sludge as a solid waste with the potential for future additional regulations under CAA or RCRA authority.

Response: These comments are not relevant to EPA's establishment of emissions standards for SSI units. Rather, they are relevant to EPA's proposed Identification of Non-Hazardous Secondary Materials That Are Solid Waste rule, and are addressed in the EPA's final action on that proposed rule.

Comment: One commenter (48.1) questioned whether any thought had been given to a better define of the term "solid". The commenter (48.1) argued that sewage sludge is a non-hazardous primary material that clearly is processed in their facility exclusively for use as fuel and should not be considered solid waste. The commenter (48.1) stated that even the word

"solid" belies the very nature of sludges, which are a liquid, incapable of holding a shape and required to be contained or they run as any liquid would. The commenter (48.1) stated that sewage sludge is appropriately subject to section 112 of the CAA; and the consideration of human sewage sludge as solid waste is arbitrary.

Other commenters (102.1, 116.1) argued that sewage sludge is not "solid waste", but a by-product of the wastewater process. The commenters (102.1, 116.1) stated that when sewage enters a wastewater facility it is basically 99.5% water; the 0.5% solid material is further separated and processed until it reaches a digestion or thickening process where it is 97-99% water or 1-3% bio-solids. The commenters (102.1, 116.1) stated that it is further de-watered by various process equipment to a point where it is somewhere between 15-30% bio-solids or still 70- 85% water. The commenters (102.1, 116.1) stated the de-watered solids (15-30%) are conveyed into either a MH or FB unit for incineration and reduction of volatile solids. The commenter (102.1, 116.1) stated that the incinerator units are almost always on the same site as the liquid side of the wastewater processing facilities and are in fact an integral portion of the treatment plant plan and process. The commenters (102.1, 116.1) urged EPA to properly define and categorize "sewage sludge" because there are numerous factors which affect the chemical, physical, and thermodynamic properties of the actual composition of sewage sludge including: the residential, commercial and industrial users of the collection system, the processes used at the wastewater treatment plant (WWTP), the chemicals used at the WWTP, types of sludge produced, type of sludge dewatering systems used, the operations at the WWTP (sludge detention times in tanks and clarifiers). The commenters (102.1, 116.1) stated that all of these factors affect the de-watering of the sludge and the characteristics of the final sludge which is sent to the SSI.

Response: This comment is not relevant to EPA's establishment of emissions standards for SSI units. Rather, it is relevant to EPA's proposed Identification of Non-Hazardous Secondary Materials That Are Solid Waste rule, and is addressed in the EPA's final action on that proposed rule.

Comment: One commenter (86.1) expressed concern with the use of the terms "clean biomass" and "other solid wastes" in the "co-fired combustor" definition of the proposed sewage sludge incineration standards. The commenter (86.1) stated that depending on the outcome of the NHSM Rule which was proposed June 4, 2010, it is possible that some biomass materials (say, for example, urban demolition wood) would be neither "clean" nor classified as "solid waste",

thereby excluding these materials from the co-fired combustor definition in the proposed sewage sludge incineration standards. The commenter (86.1) added that EPA can solve this potential problem by striking the adjective “clean” from biomass in the “co-fired combustor” definition. The commenter (86.1) stated that since EPA’s intent appears to be to include all biomass, either as clean material or solid waste, deleting “clean” from the definition would assure its intent is fulfilled regardless of the outcome of the NHSM Rule.

Response: This comment is not relevant to EPA’s establishment of emissions standards for SSI units. Rather, it is relevant to EPA’s proposed Identification of Non-Hazardous Secondary Materials That Are Solid Waste rule, and is addressed in the EPA’s final action on that proposed rule. EPA is not establishing de minimus levels of solid waste that can be burned in incinerators but not subject to the SSI standards. The CAA defines solid waste incineration unit to mean any unit combusting *any* solid waste, and EPA does not believe that a de minimis exemption is appropriate where a unit is combusting some solid waste. Therefore, any amount of sewage sludge combusted in an incinerator located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to the final SSI standards. In the proposed rules, we had inadvertently left in a definition for co-fired combustor. However, the definition was not used in the rule and we did not propose any requirements for co-fired combustor. This definition has been removed from the final rules.

Comment: Two commenters (73.1, 108.1) are concerned that the proposed rule changes will exert a negative effect on efforts across the country to use biosolids as a carbon neutral, renewable energy source. One commenter (108.1) stated that by defining biosolids as a non-hazardous solid waste for combustion purposes in the manner employed in the proposed rule implies that biosolids are a material to be disposed of rather than a resource with energy value. The commenter (108.1) stated they vehemently disagree with the rule where it explicitly states that such energy recovery is "sham recycling". The commenter (108.1) wrote about a project they are working on that seeks to recycle biosolids for a community energy benefit. The commenter (108.1) urged EPA to reconsider defining biosolids as municipal solid waste stating that biosolids are a valuable resource used as soil amendments, fertilizer, and fuel; as such, they should not be considered a waste.

Specifically, one commenter (73.1) stated that EPA should not determine that sewage sludge pellets are a solid waste before the Proposed Rule on Identification of Non-Hazardous Secondary Materials That Are Solid Wastes (Docket ID No. EPA–HQ–RCRA–2008–0329) is

finalized. The commenter (73.1) urged EPA to define sewage sludge pellets as a non-hazardous secondary material that is a solid waste. The commenter (73.1) specifically argued that sewage sludge pellets should not be considered a solid waste, but rather a renewable fuel. The commenter objects to the Agency's determination, and refutes the "Legitimacy Criteria" proposed by the Agency in 241.3(d)(1) of the proposed solid waste determination.

The commenter (73.1) stated that as the nation is striving to achieve stated policy of producing as much green energy as possible, all such avenues should be encouraged and facilitated. The commenter (73.1) stated that dried sewage sludge pellets which are used as biogenic alternative fuels, or otherwise produce energy should be recognized as such and not have regulatory roadblocks constructed to impede such uses. The commenter (73.1) recommended that in order to support the Nation's policy to use renewable fuels, the Proposed Rule should explicitly exempt a de minimus percentage (less than 30% of the overall fuel consumption of the facility) of sewage sludge pellets combusted in a biomass facility, cement kiln, or other combustion facility that beneficially uses sewage sludge pellets as a fuel before subjecting such a facility to CAA §129 regulations. The commenter (73.1) recommended that language be added to mirror 40 CFR part 503 whereby a combustion unit is only considered a SSI if it combusts more than 30% by weight sewage sludge. The commenter (73.1) stated that California heat dried sewage sludge is sometimes used in cement kilns as an alternative fuel to coal. The commenter (73.1) is concerned that the cement kiln, having accepted dried sewage sludge as fuel, would be regulated under both §112 and §129 of the CAA.

Response: This comment is not relevant to EPA's establishment of emissions standards for SSI units. Rather, it is relevant to EPA's proposed Identification of Non-Hazardous Secondary Materials That Are Solid Waste rule, and is addressed in the EPA's final action on that proposed rule.

3.5 Other

Comment: One commenter (84.1, 119.1) contended that EPA should make the proposed sewage sludge incineration standards expressly applicable to SSI units operated on passenger vessels such as large cruise ships because they produce large amounts of biomass that must be dealt with. The commenter (84.1, 119.1) referenced a study indicating between 15 to 40 metric tons of biomass are produced per day. The commenter (84.1, 119.1) included an attached 2009 study published by the Port of Seattle that provides details of cruise vessel biomass management.

The commenter (84.1, 119.1) expressed concern that such operating plans cannot be verified, and that biomass was being incinerated close to the U.S. shore.

Response: EPA defines the term ‘stationary source’ to mean generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle as defined in section 7550 of this title. A passenger vessel or other type of ship that is not propelled by a non-road engine (e.g. boiler), then the passenger vessel or ship would be considered a stationary source. Therefore, any air emissions from an incineration unit combusting non-hazardous solid waste on the ship would be subject to Section 129. A passenger vessel or other type of ship that is propelled by a non-road engine (e.g. diesel engine) then the passenger vessel or ship would be considered a mobile source. Therefore, any emission point location on the source would be part of the mobile source emissions. 'Mobiles source' is a term used to describe a wide variety of vehicles, engines, and equipment that generate air pollution and that move, or can be moved, from place to place.

4.0 EMISSION LIMITS AND GUIDELINES

4.1 Metals

Comment: Several commenters (58, 105.1, 138, 135.1, 101.1, 126.1) are concerned about the proposed mercury emission limits. One commenter (58) stated that the removal methods EPA described to meet the proposed mercury limits are unproven and expects costs to upgrade their incinerators to be too high. Another commenter (105.1) is concerned whether the proposed mercury limits can be consistently met as they compared the limit to past stack test results and found that in order to meet the mercury limit they would need an excess of 85% control. Another commenter (135.1) mentioned that a number of SSIs have invested significant money making improvements to their process to improve performance and reduce mercury emissions, but the proposed standards will penalize these facilities. The commenter (135.1) is concerned that the higher mercury concentration in the flue gas of these facilities will require higher control efficiency than anticipated by EPA to achieve the concentration based standard. Two other commenters (101.1, 126.1) stated that their sewage sludge incinerators will be able to meet the proposed NSPS for existing MHIs, except for the proposed limits for mercury. The commenter (126.1) stated that to be able to meet the mercury limit of 0.02 mg/dscm @ 7% oxygen proposed for existing Mills, new APC equipment must be provided to remove 0.00701 tons of mercury each year from the incinerator exhaust gases (an annual average Hg control efficiency of 79.2%).

Response: EPA proposed a beyond-the-floor mercury limit for SSI units. However, after evaluating the revised emissions dataset (see the memorandum "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology"(EPA-HQ-OAR-2009-0559) for further details) and re-evaluating the types of controls needed to go beyond-the-floor, EPA concluded that it would not be cost effective to go beyond-the-floor for mercury control. Therefore, the final mercury emission limits are 0.037 mg/dscm for FB units (as opposed to the proposed limit of 0.0033 mg/dscm) and 0.28 mg/dscm for MH units (as opposed to the proposed limit of 0.02 mg/dscm).

Comment: One commenter (67.1) stated the proposed sewage sludge incineration standards for cadmium and lead are unrealistically low and may not be measurable or achievable with any technology.

Response: The MACT floor limits are based on EPA's variability analysis, which is described in the memorandum, "Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" in the SSI docket (EPA-HQ-OAR-2009-0559). For units for which test data were available, cadmium and lead concentration averages were below the final cadmium and lead emission limits for all but one unit (a MH unit). For this unit, and units for which no data were available an which may require control, EPA believes the final metals limits for existing units are achievable with the addition of either a venturi scrubber or a wet electrostatic precipitator (see revised compliance cost and reductions memo for further details). In the NPRM we requested additional emissions information. However, no new emissions test information was received. Based on the data available, we are aware of a number of SSI units that are currently able to meet the emission limits for all the pollutants.

Comment: One commenter (54.1, 60.1) stated that PM is not a surrogate for metals control, and also disagreed with EPA's use of PM mass in its cost-benefit analysis calculations. The commenter (54.1, 60.1) recommended EPA require multi-metal CEMS to demonstrate compliance with HAP metal emission limits. The commenter (54.1, 60.1) argued that PM does not meet the court-defined criteria for HAP metal surrogacy under EPA-recognized conditions, as stated in its current proposed rules as well as under previously proposed rules (CISWI). The commenter (54.1, 60.1) stated that in a 2004 case Sierra Club v. EPA and others, the Court of Appeals established a three-part test for surrogacy based on their earlier ruling in National Lime. Sierra Club v. EPA, 353 F.3d 976 (D.C. Cir. 2004)("Copper Smelter MAGI"); and all three criteria must be met to use PM as a surrogate for HAP metals. The commenter (54.1, 60.1) quoted EPA from page 63268 part A of the proposed SSI rules: "EPA understands that the metal emissions from SSI units are influenced by the metals content in the sludge burned". The commenter (54.1, 60.1) argued that if an emission source can change the output concentration of metals by changing the input, but it doesn't change the PM mass, then PM is not an effective surrogate for metals.

Response: We are not using PM as a surrogate for metals. Section 129 of the Clean Air Act requires EPA to set emission standards for 9 pollutants, including PM, Hg, Cd, and Pb. We have done so in the proposed and final rules. The final rule is structured around periodic performance testing that demonstrate compliance with the emission limits with contemporaneous collection of process and control device operating conditions to use in establishing enforceable operating limits sufficient to assure continuous compliance. We believe that the combination of

periodic performance testing and continuous monitoring of monitoring of site-specific operating limits tied to the performance testing will provide an adequate assurance of compliance. In addition, for existing SSI units, the rule allows the use of Cd, CO, HCl, NOx, PM, Pb or SO2 CEMS; ISTMMS; and ISTDMS (continuous sampling with periodic sample analysis) as approved alternatives to the parametric monitoring and annual compliance testing. For new SSI units, CO CEMS are required for determining continuous compliance, and use of Cd, HCl, NOx, PM, Pb or SO2 CEMS; ISTMMS; and ISTDMS (continuous sampling, with periodic sample analysis) are approved alternatives to parametric monitoring and annual compliance testing.

Additionally, at this time, EPA does not have a promulgated performance specification for multi-metal CEMS and cannot require it be used.

4.2 PM

Comment: Several commenters (76.1, 97.1, 127.1, 110.1, 129.1, 54.1, 60.1, 86.1, 134.1) supported EPA's decision to not include $PM_{2.5}$ standards in the sewage sludge incineration standards. One commenter (86.1) also stated that EPA should not recognize the OTM 27/28 methods for PM performance testing because the methods measure not only PM actually present in the flue gas but also any particulate matter formed from the interaction and condensation of gaseous organic/inorganic flue gas constituents in the sampling train, and thereby measure and report PM which is beyond the capability of the PM control device selected as MACT. In addition, the commenter (86.1) stated that OTM 27/28 methods have not been validated on SSIs as mandated by Section 129. Another commenter (97.1, 127.1) stated that it is reasonable for EPA to control both total and fine particulate by using surrogates because the use of wet scrubbers is not always compatible with OTM 27. The commenter (97.1, 127.1) stated that entrained water droplets that occur when stack gas moisture levels exceed vapor capacity can bias $PM_{2.5}$ particle measurements and provide inaccurate readings of filterable $PM_{2.5}$. The commenter (97.1, 127.1) also stated that the same control devices would be required to control both total and final particulate, and cited Cf. Nat'l Lime Assoc. v. EPA, 233 F.3d 625, 637 (D.C. Cir. 2000) (citing Dithiocarbamate Task Force v. EPA, 98 F.3d 1394, 1399 (D.C. Cir. 1996)). The same commenter (97.1, 127.1) referenced a document [Footnote: Russell R. Dickerson et al., $PM_{2.5}$ Maryland State Implementation Plan Weight of Evidence Report 4-40 to 6-40 (Jan. 30, 2008)] that supports correlations between reductions in SO_2 and NO_x and reductions in nitrate and sulfate contributions to $PM_{2.5}$. Another commenter (54.1, 60.1) stated that the difficulties

existing for measurement of $PM_{2.5}$ demonstrates a clear example of why $PM_{2.5}$ is not an appropriate tool for modeling or assessing health effects of toxic PM components, such as metals. Two commenters (76.1, 97.1, 127.1) said that limits on filterable particulate matter and opacity provide an adequate surrogate for direct fine particulate matter contributing to $PM_{2.5}$.

Response: For the final rule, EPA maintains that it is not appropriate to set limits for $PM_{2.5}$ for the reasons discussed in the NPRM.

4.3 CO

Comment: Some commenters (65.1, 125, 77.1, 145.1, 134.1) are concerned about the proposed CO emission limits. One commenter (65.1) suggested that setting the MACT floor limit of 56 ppmvd for CO on existing FB incinerators is somewhat over kill and states that time does not permit calculation of the additional fuel and the resulting CO_2 emissions generated to assure this level is reached at all times. The same commenter (65.1) also stated that the MACT floor limit of 7.4 ppmvd for CO on new SSI units is more stringent than any emission limit for CO anywhere in the world. The commenter (65.1) speculated after reviewing the data presented that the 7.4 ppmvd CO limit was based solely on six one-hour tests at YCUA on a brand new incinerator being operated to demonstrate performance to the owner. The commenter (65.1) stated that continuous CO emission compliance with a standard of 7.4 ppmvd corrected to 7% O_2 is not possible, and urged EPA to see how the unit performs after four years of operation. Another commenter (125) provided a review of BACT for CO emissions from natural gas-fired turbines and surmised that it does not seem reasonable to require a biosolids-fired FB to meet an emission standard that is equivalent to those of a natural gas-fired combustion device. The commenter (125) stated that using best combustion practices the CO emissions from biosolids-fired FBs are already low, as shown by the baseline CO concentrations of 16.3 ppmdv @ 7% O_2. The commenter (125) argued that new FB units will likely require the addition of an afterburner or thermal oxidizer to meet the proposed CO emission standard of 7.4 ppmdv @ 7% O_2, and that the afterburner or thermal oxidizer will combust natural gas, generating its own NO_x and CO emissions. The same commenter (125) further argued that the requirement to add an afterburner or thermal oxidizer to a FB in order to meet the CO emission standard will not decrease the overall CO emissions and will increase NO_x emissions and other pollutant emissions from the process. Another commenter (77.1) stated that the proposed CO limit of 3900 ppm for existing MH incinerators is a significant loosening of this standard and is unnecessary since under the

Part 503 standards MH units are attaining significantly lower CO levels even though they are for the most part conforming to a THC standard. The commenter (77.1) stated that 40 CFR Section 503.44 establishes a total hydrocarbon (THC) emission limit for all existing and new SSIs of 100 ppm (v/v) corrected to 7% O_2 and 0% moisture; and a subsequent amendment to 40 CFR Section 503.44 permitted the measurement of CO as an alternative to THC and the CO limit was established at 100 ppm (v/v) corrected to 7% O_2 and 0% moisture. The commenter (77.1) purported that while all FB incinerators could meet the more stringent CO standard and, therefore, the THC limit as well, MH units being less efficient combustors could only comply with the less stringent THC limit (meeting the THC limit never resulted in any MH unit producing CO emissions more than a few hundred ppm). One commenter (134.1) also recommended using the Part 503 THC standards. One commenter (56.1) contended that most states limit Carbon Monoxide (CO) to 100 ppmvd at 7% O2, based on the Part 503 requirements. The commenter (56.1) contended that regulation to the current 100 ppmvd at 7% O2 is appropriate in view of the cost-effective technology available. Another commenter (145.1) also suggested a CO limit of 100 ppmv (and the same for NO_x), stating that while it may be possible to have CO or NO_x as low as the proposed standard, the other compound would be at a much higher concentration level. Commenters (64.1) urged EPA to adopt lower carbon monoxide emission standards for sewage sludge incinerators.

Response: The CO limits in the final rule are based on EPA's revised UPL methodology, which is documented in the memorandum, "Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" in the SSI docket (EPA-HQ-OAR-2009-0559). The revised final CO emission limit for new FB units is 27 ppmvd and for new MH units is 52 ppmvd. The revised and final CO limits for existing FB units is 64 ppmvd and for existing MH units is 3,800 ppmvd. For MH units, the UPL calculation includes information from several units with CO emissions measured at greater than 1000 ppmv. These facilities complied with the part 503 alternative THC limit but had high CO concentrations. EPA is required to set limits for CO for units regulated under Section 129 of the Clean Air Act, and is not allowed to use surrogate compounds, such as THC.

Please refer to the MACT floor UPL calculation and EG and NSPS emissions limits section of the preamble for a detailed description of how these limits were chosen. The final rule also allows 24-hour block averages for CO CEMS (which are required at new sources), and 12-hour block averages for operating parameters. The combination of revised emission limits and

averaging times may address the commenters concerns regarding compliance with the CO emission limits. EPA chose not to go beyond the floor due to increases in NO_x and CO, cost, and energy inputs. States have the option to set limits more stringent than the emission guidelines and can set lower CO limits.

4.4 CDD/CDF

Comment: One commenter (129.1) suggested that the dioxin limit only be on a TEQ basis in lieu of the proposed TEQ and TMB basis. Another commenter (86.1) suggested the dioxin limit only be on a TMB basis because the same test, EPA Reference Method 23, is used to measure both TMB and TEQ; and the only difference is a mathematical calculation using TEQ factors to convert the measured TMB values to TEQ values. The commenter (86.1) also indicated that TEQ factors have changed over the years from the original 1989 I-TEQ to the presently used 2005 World Health Organization Toxic Equivalence Factors, so setting a TEQ standard represents a potentially moving target. The commenter (86.1) stated that two standards are not required by Section 129 which lists “dioxins and dibenzofurans” only once and without distinction between TMB and TEQ (Section 129(a)(4).) The commenter (86.1) argued that MACT standards are based on emissions reductions at best performing units, i.e. are technology based as opposed to health based. Another commenter (95.1) suggested that EPA allow facilities to meet either the TEQ or TMB proposed standard but not both. One commenter (129.1) provided results from a study that indicated the incinerators located at their WWTPs are reducers of dioxins. The commenter provided emission estimates from the incinerators of 2.3 ng TEQ/dry kg of sludge incinerated and compared these to the dioxins concentrations in the sludge (92 ng TEQ/dry kg and 42 ng TEQ/dry kg).

Response: The final standards provide facilities the option to comply with either the TEQ of TMB limits. This provides flexibility for sources to comply.

4.5 Opacity

Comment: One commenter (95.1) stated that EPA should drop the opacity standard. The commenter (95.1) argued that opacity is listed in Section 129(a)(4) of the Clean Air Act, but Congress included a parenthetical “as appropriate" for this substance giving EPA the option of not setting numerical emission limits for opacity. The commenter (95.1) said there is no reason for having both a PM and an opacity standard, especially at the PM levels proposed. At least one

commenter (49.1) stated that opacity from MH incinerators should be considered from the perspective of particulate emissions; the commenter cited research that revealed that submicron particulates are emitted from the stack with the same wavelength as visible light, thus creating an opacity issue.

Several commenters (111.1, 117.1) stated that the proposed zero percent (0%) opacity limits are unrealistic. Two commenters (129.1, 134.1) stated that a continuous opacity limit of zero percent (0%) is not achievable for existing fluidized bed incinerators and all new SSI units. Two commenters (111.1, 117.1) expressed the concern that the opacity tests were too subjective, stating that an inspector could easily inaccurately register a measurement greater than 0%. One commenter (129.1) urged EPA to realize that the opacity reported during the Information Collection Request testing was visually collected; and during cold weather, fluidized bed incinerators may have white steam plumes, which would exceed the zero percent opacity limit. The commenter (129.1) also stated that continuous opacity monitors will always report a value of greater than 0%. Other commenters (134.1) argued that the equipment available for continuously monitoring opacity in SSI exhaust gases is notoriously inaccurate and unreliable; and stated that visual measurements are somewhat arbitrary at best. The commenter (134.1) stated that this emission parameter is of limited usefulness from a regulatory perspective and that if all other emission parameters, particularly PM, NO_x, HCl and SO_2 are controlled to the proposed levels, opacity will not be present to an objectionable or measurable degree. The commenter (134.1) stated that from the perspective of opacity as it relates to ash handling systems, this is more appropriately regulated as a fugitive dust emission than under the guise of opacity. Two commenters (117.1, 134.1) recommended that the opacity limits for existing FB units and all new SSI units be established at 10%, which are more attainable as a regulatory limit. Another commenter (111.1) suggested the use of Method 22 over Method 9 to reduce the subjectivity of the opacity tests.

<u>Response</u>: Instead of establishing opacity limits, the final rules include rigorous requirements for establishing site-specific operating limits derived from the results of performance testing. The rules also include a requirement that sources update those enforceable operating limits with each repeated performance test. Re-establishing operating limits periodically will assure that the monitoring will continue to indicate compliance with the PM emissions limits. The rules also provide the source the option of apply CEMS to monitor directly the pollutant of interest in lieu of parametric monitoring. We believe that continuous compliance

with operating limits and periodic stack testing to verify the operating limits plus the CEMS option will ensure that sources demonstrate continuous compliance with the PM emission limits as effectively as would periodic or continuous monitoring of a broadly applicable opacity limit.

4.6 Exhaust Gas Concentration

Comment: One commenter (126.1) stated that the correction of exhaust gas concentrations to 7% oxygen can be problematic during periods of normal sludge incineration since the exhaust oxygen level is a function of the total amount of sludge and fuel combusted within the SSI. The commenter (126.1) argued that at reduced feed rates, oxygen levels are considerably elevated compared to those resulting from incinerating sludge at or near maximum capacity of the SSI. The commenter (126.1) provided an example that when operated at or near the maximum capacity of 2.0 DTPH their exhaust gas is about 12,000 dscfm at 6.7 percent oxygen; whereas at normal incineration rates of 1.1 to 1.2 DTPH the volumetric exhaust flow is similar, but the oxygen content is 11.6 percent.

Response: Concentrations are corrected to 7% O_2 in order to standardize the pollutant emissions. As the commenter notes, operating at different feed rates but maintaining similar flow rates yields different oxygen levels. Varying the feed rate while maintaining the same flue gas flow rate will yield different pollutant concentrations as well. In other words, a higher feed rate will yield a lower O_2 level but a higher pollutant concentration. The uncorrected concentrations are not analogous because of the different feed rates and O_2 levels, so concentrations must be corrected to 7% O_2 so that concentrations are comparable for both cases.

4.7 Other

Comment: Commenters (84.1, 119.1) argued EPA's SSI standards are especially weak for cadmium, lead, PM, HCl, and SO_2 – the pollutants for which EPA has failed either to propose beyond-the floor standards or to propose standards that will provide coincidental reductions. The commenter stated that all of these pollutants have extremely serious adverse health effects. The commenter contended that EPA neglects not only its legal obligations but the health of American communities by allowing SSI to continue emitting these pollutants without reducing them by the maximum achievable degree.

Response: EPA disagrees with these comments. We have analyzed the beyond the floor control options for all pollutants and determined that it was not appropriate to require additional

control given costs and other relevant factors. Please refer to the memorandum “Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units” (EPA-HQ-OAR-2009-0559) for further information.

5.0 FORMAT OF THE PROPOSED STANDARDS AND GUIDELINES

Comment: Several commenters (126.1, 134.1, 101.1) were of the opinion that EPA erred in setting the standards on an emission concentration basis with regard to the variability in the pollutant loading in the sludge incinerated during the emission tests used by EPA to establish the limits. One commenter (134.1) stated that the use of concentration limits, rather than control efficiencies or total daily mass emissions, is not appropriate for certain regulated pollutants as concentration limits do not reflect the unique feed conditions present in each SSI unit and may unfairly penalize units with very low or very high feed concentrations of certain pollutants, such as mercury, cadmium, or lead. The commenter (134.1) purported that units with very high feed concentrations may not be able to comply with the proposed limits, as the requisite control efficiency needed for compliance may be unattainable. The commenter (134.1) stated that the EPA 503 regulations took these differences into account for many of the regulated metals and created emission limits based on control efficiencies, coupled with feed concentration limits, to provide adequate protection of health and the environment. The commenter (134.1) recommended that consideration be given to establishing limits based on a similar approach and allowing a calculation method to be available as a substitute for annual testing or CEMS monitoring to demonstrate unit compliance.

Other commenters (126.1, 65.1, 101.1) stated that the data used to generate the MACT standards should measure the performance of the actual air pollution control technology. Commenters (126.1, 65.1, 101.1) noted that since the proposed rule specifies an emission concentration limit, using the same control device on incinerators burning sludge with larger inlet concentrations will likely result in higher than the proposed emission rates. Specifically, some commenters (105.1, 137.1) stated that the methodology used in developing the proposed standards did not take into account that Hg, Cd, Pb, HCl and SO_2 emissions are a function of the sludge content and that the concentrations of these compounds in the sludge varies significantly between facilities and over time. The commenters (105.1, 137.1) stated that basing the standards on the lowest emitting sources is not appropriate or justifiable if the best test results were obtained with a sludge containing very low concentrations of metals, Cl, and S. Commenters (137.1) noted that the same metals emission rate could be unattainable by another facility, even if it has more advanced controls and removes a higher percentage of the metal.

One commenter (134.1) specifically suggested that the proposed limits for SO_2 be more appropriately expressed as a control efficiency to allow for those units with high sulfur content in the feed. The commenter (134.1) stated that the proposed limits for SO_2 are extremely low, given that a typical feed contains 1-2% (but sometimes as high as 5%) sulfur; translating to an uncontrolled SO_2 concentration on the order of 1,000 ppm or more prior to scrubbing. The commenter (134.1) suggested that the selection of the best performing 12% of units be based on removal efficiency and sulfur content in the feed, not just reported final emissions, as emissions alone do not necessarily reflect good performance. The commenter (134.1) also stated that it is not unreasonable for the proposed HCl emissions limit on existing units be expressed in a concentration format since chlorine content in the feed is typically low and not subject to a large variation; however, the commenter thought an emission rate expressed in pounds per ton of feed would be more appropriate. The commenter (134.1) suggested that the proposed limits for new units be based either on control efficiency or a mass per unit feed processed in order to account for potential differences in feed characteristics.

Similarly, other commenters (129.1) stated that the proposed rule's change to emission limits in milligrams per dry standard cubic meter @7% oxygen and ppmvd @ 7% oxygen will be a major change for the industry. The commenter (129.1) stated that POTWs are currently subject to emission limits that are in pound (pollutant) per dry ton of sludge incinerated. Two commenters (101.1, 126.1) specifically stated that emission standards set as pollutant concentrations corrected to 7% oxygen may be appropriate for some air contaminants such as CO and SO_2, where CEMS are utilized for compliance monitoring (when charging sludge feed), but a mass emission limit that accounts for the sludge incineration rate similar to the Subpart O PM limit of 1.3 lb/DT is preferred for most air contaminants.

Another commenter (135.1) stated that EPA must consider that concentration limits may not be appropriate for facilities where efficiency improvements were made. In particular, the commenter (135.1) mentioned that a number of SSI have invested significant money making improvements to their process to improve performance and reduce mercury emissions, including improvements that resulted in a reduction in the flue gas volume, thereby increasing flue gas concentration of mercury without increasing the mass of mercury being emitted (for example, flue gas recirculation in MH furnaces and increasing the sludge solids will both reduce flue gas volume while not altering the mass of mercury being emitted). The commenter (135.1) is concerned that the higher mercury concentration in the flue gas of these facilities will require

higher control efficiency than anticipated by EPA to achieve the concentration based standard. The commenter (135.1) argued that EPA is penalizing these facilities for historical actions that reduced emissions.

Other commenters (137.1, 105.1, 80.1) argued that the standards should be established to provide for compliance with either a concentration limit or a percent reduction, whichever is less stringent, similar to other regulations such as the Municipal Waste Combustor (MWC) regulations.

Response: EPA did not have sufficient data to set alternative control efficiency standards or standards in other units at proposal. We requested additional information in the proposal. However, sufficient data were not provided in response to our request for alternative formats to be developed. See Section V of the preamble to the final SSI rules for additional discussion.

6.0 SELECTION OF SUBCATEGORIES

Comment: Numerous commenters (58, 61.1, 63.1, 68.1, 69.1, 74.1, 78.1, 81.1, 87.1, 90.1, 94.1, 97.1, 127.1, 102.1, 105.1, 106.1, 107.1, 109.1, 110.1, 112.1, 114.1, 116.1, 117.1, 118.1, 126.1, 120.1, 129.1, 132.1, 134.1, 136.1, 101.1, 85.1, 115.1,138) agreed with EPA's development of separate emission guidelines for existing MH and FB SSIs. One commenter (129.1) stated that only MH and FB incinerators are currently being utilized at POTWs to incinerate sewage sludge. However, most of these commenters (58, 61.1, 63.1, 68.1, 69.1, 74.1, 78.1, 81.1, 87.1, 90.1, 94.1, 102.1, 105.1, 106.1, 107.1, 109.1, 112.1, 114.1, 116.1, 117.1, 118.1, 120.1, 129.1, 132.1, 136.1, 97.1, 127.1, 115.1) suggested adding sub-categorization based on a number of parameters, such as the size of the SSI, the type of sewage sludge incinerated, limited use of the SSI, and/or the distance over which a utility would need to transport its sludge for disposal. One commenter (115.1) recommended EPA establish some types of subcategories for new or food-processing SSI sources. The commenter (115.1) included reference material comparing their sewage sludge metals concentrations to results of other studies. Another commenter (132.1) specifically requested that EPA add a subcategory that recognizes differences between wet and dry treatment systems. The commenter (132.1) is concerned that moisture content and other issues such as back pressure would prohibit a wet system such as theirs to install a fabric filtration system due to technical infeasibility of the facility itself and current equipment configuration.

Response: EPA is not subcategorizing SSI units on any basis other than the distinction between FB and MH units because EPA does not have information demonstrating any other distinctions among SSI units based on class, type, or size.

Comment: Numerous commenters (58, 61.1, 63.1, 68.1, 69.1, 74.1, 78.1, 81.1, 87.1, 90.1, 94.1, 102.1, 105.1, 106.1, 107.1, 109.1, 112.1, 114.1, 116.1, 117.1, 118.1, 120.1, 126.1, 129.1, 136.1, 65.1, 101.1) as well as others expressed that it is inappropriate to consider the best performing FB SSIs as the best performing similar source for the MH SSI new source subcategory; and many stated that as proposed, the new source performance standards would severely restrict a POTW's ability to modify existing MH incinerators, including modifications to improve combustion efficiency or boost steam output for electricity generation. Specifically, commenters (95.1, 76.1) rejected EPA’s proposal to establish emission limits for new MH incinerators at the same level as for new FB incinerators. Commenters (76.1) argued that MH

and FB SSIs are separate subcategories and therefore, new MH SSIs should not have to meet the best performing FB SSI standard. One of these commenters (95.1) stated that to establish the same emission limits for more than one subcategory is equivalent to expanding the data pool outside the top performers. Another commenter (97.1 and 127.1) stated that EPA is essentially setting a beyond-the-floor MACT limit for MH SSIs without considering any of the criteria that the statute requires. Commenters (95.1, 76.1) contended that the Section 129 MACT requirements do not exclude using the best performing MH unit simply because it is 20 years old; the commenters (76.1) stated that EPA must develop a separate set of standards for the best performing MH SSI regardless of the age because there is no statutory limit on the age of the MH SSI that is the best performing. One commenter (122) noted that their MH incinerator was less than 20 years old, contrary to language in the proposed rule that stated EPA is unaware of any new MH sources constructed in the last 20 years. Several commenters (110.1, 76.1) expressed concern that sources would need to make burdensome modifications to existing MH units in order to meet the standards for new sources (based on the best-performing FBI). Commenters (85.1, 97.1, 127.1, 90.1) further argued that EPA's proposed approach would discourage incremental improvements at MH SSI because these improvements would trigger FB-based emission limits that cannot be met. One commenter (110.1) was of the opinion that the proposed standards would force sources to abandon the use of MH incinerators because the standards are unachievable by MHs.

Multiple commenters (95.1, 76.1) requested that EPA establish separate limits for the new MH and FB subcategories, using the best performing MH incinerator to set the emission limits for new MH incinerators. These commenters (85.1, 97.1, 127.1) stated that establishing separate emission limits for new MH and FB SSIs would also preserve incentives for innovation and for improvements in the operation of MH SSI currently in use.

Conversely, one commenter (77.1) agreed with the EPA proposal that the best performing FB SSI serve as the best performance similar source for the MH SSI new source subcategory. The commenter (77.1) stated that in spite of the CAA provision that allows for sub-categorization of combustion units, all sewage sludge units should be required to operate at the FB level of performance. The commenter (77.1) said MH units were originally designed to be ore roasters in metallurgical processes and not designed to be efficient solid waste combustors. One commenter (49.1) stated that EPA should not allow new multiple hearth (MH) incinerators, and should establish fluidized bed (FB) incinerators as the baseline for new units. The

commenter (49.1) argued that FB incinerators have advantages such as electrostatic precipitators, high solids centrifuges, and water sprays which were not available on MH incinerators built prior to the mid 1980's. Another commenter (79.1) said that while sub-categorization for existing sources for MH and FB SSIs may make sense, given the lack of newer MH SSIs, it does not seem to make sense to create a subcategory for that technology in the new source standard. Another commenter (80.1) asked that one set of emissions limits be set for both MH and FB SSIs as a means of fairness, recognizing that the same emissions limits are equally protective of health and the environment.

Response: In the final NSPS, SSI units at new sources are subcategorized into two subcategories: MH and FB. Please see Sections IV and V of the preamble to the final SSI rules.

7.0 TITLE V PERMIT REQUIREMENTS

Comment: Several commenters (63.1, 62.1, 80.1, 83.1, 121.1, 129.1, 135.1, 102.1, 116.1) are concerned about the proposed regulation requiring facilities to comply with Title V requirements. Many of these commenters (63.1, 62.1, 80.1, 83.1, 121.1, 102.1, 116.1) said the Title V requirements will impose further expense and/or paperwork. One commenter (80.1) requested EPA specifically consider dropping the requirement for a Title V Operating Permit for a minor source because a facility with a minor source air permit can still update that minor source permit to include the appropriate emission limitations, as well as stack testing, monitoring and reporting requirements. The commenter (80.1) is concerned that the facility would then be subject to any future major source MACT regulations, adding other potential costs, even though it is a minor source. Another commenter (121.1) argued that Title V reporting requirements are unnecessary because the reporting is already required under 40 CFR Part 503, 40 CFR Part 60, and other air permits. Another commenter (129.1) stated that they currently have three POTW facilities that practice incineration including a Title V facility, a synthetic minor facility, and a naturally minor facility. The commenter (129.1) is concerned that, under the proposed rules, two of these facilities would become Title V facilities. The commenter (129.1) pointed out that even though their naturally minor facility emits less than six (6) tons of priority pollutants per year, the proposed rule would make it a Title V facility. Another commenter (135.1) stated that many of the SSI impacted by this NSPS are minor sources of air emissions and requiring the additional regulatory burden in states with delegation of NSPS programs seems unreasonable for minor sources of air emissions. The commenter (135.1) pointed out that several state regulatory programs have been rigorous, requiring the application of BACT or LAER for each pollutant that a SSI had the potential to emit, as well as a demonstration of compliance with air toxics programs to ensure human health was protected. Also, a commenter (102.1, 116.1) is concerned that EPA gave no explanation for the proposed regulation requiring facilities to comply with Title V requirements. The commenter (102.1, 116.1) expressed that there is no apparent need and EPA gave no regard for the fact that many facilities been previously authorized under Synthetic Minor status by their respective states and EPA.

Response: All nonmajor (minor) solid waste incinerators subject to the final sewage sludge incinerator rule are subject to the requirement to obtain a title V permit under sections 129(e) and 502(a) of the CAA. See Section III.H. of the proposed preamble entitled “Title V

Permit Requirements" for additional discussion relative to these requirements. The requirement for a solid waste incinerator to obtain a title V permit does not vary based on whether the source in question is a major or nonmajor source, although a source's major/nonmajor status does impact when a source applies for a title V permit.

Additionally, an applicability determination under section 112 of the CAA is an applicability determination that is separate from a section 129 applicability determination.

Comment: One commenter (92.1, 104.1) pointed out that 60.5235(c) specifies an Annual Compliance Report requirement for SSI units subject to the proposed rule, but then adds a statement regarding whether the unit is subject to permitting requirements under title V of the Clean Air Act. The commenter (92.1, 104.1) stated that under 60.5240 and 60.5245 the unit is always subject to permitting requirements under Title V; and therefore, the "if" statement is unnecessary. The commenter recommended that EPA change the note text in 60.5235(c) to say "(You may be required to submit these reports more frequently by the Title V operating permit required under 60.5240)."

Response: We agree with the commenter and have made this change, as well as added that the additional reports that may be required by a title V permit may include additional compliance information. We have also made these changes to paragraph 60.4915(d), except in this paragraph we will reference section 60.4920 of the NSPS instead of 60.5240 of the EG.

Comment: One commenter (89.1) asked whether EPA calculated the increased economic and resource burden to those facilities that must now be fully regulated under EPA's Title V Operating Permit Program as a result of the Proposed Standards. The commenter (89.1) requests that EPA provide this information.

Response: Costs associated with permitting SSI facilities are covered under information collection requests for 40 CFR parts 70 and 71, which have been approved by the Office of Management and Budget.

Comment: One commenter (130.1) recommended EPA consider regulations that require basic protections of any Tribal land and resources considered culturally important to Tribes. The commenter (130.1) suggested that having SSI units obtain Title V permits may trigger Tribal consultation with regard to potential impacts from the SSI unit. The commenter (130.1) stated that risks associated with air emissions must be addressed accordingly through enforceable federal safeguards so as to protect the health and welfare of Indian Tribes across the nation.

Response: Our consultation with Indian tribes is addressed in section VIII.F. of the proposed preamble.

8.0 BASELINE EMISSIONS ESTIMATES

8.1 Baseline Emissions Overstated

Comment: Numerous commenters (81.1, 58, 67.1, 75.1, 87.1, 93.1, 94.1, 96.1, 103.1, 106.1, 107.1, 109.1, 111.1, 113.1, 117.1, 121.1, 87.1, 138, 58, 67.1, 68.1, 69.1, 70.1, 71.1, 72.1, 74.1, 75.1, 76.1, 81.1, 83.1, 94.1, 96.1, 129.1, 97.1, 127.1, 101.1, 102.1, 103.1, 105.1, 106.1, 107.1, 108.1, 109.1, 110.1, 111.1, 112.1, 113.1, 114.1, 115.1, 116.1, 117.1, 120.1, 121.1, 126.1, 129.1, 131.1, 132.1, 134.1, 136.1, 102.1, 116.1, 138, 145.1, 76.1, 129.1) stated EPA over estimated baseline emissions of several pollutants for their facility. Commenters (81.1, 58, 67.1, 87.1, 138, 67.1, 72.1, 76.1, 81.1, 96.1, 97.1, 127.1, 80.1, 93.1, 101.1, 103.1, 105.1, 110.1, 111.1, 112.1, 113.1, 114.1, 115.1 117.1, 120.1, 121.1, 126.1, 129.1, 134.1, 76.2, 138, 145.1, 76.1, 129.1) provided or claimed recent stack test data and emission estimates support their argument. Commenters provided several reasons for emissions: incorrect air flow rate parameters were assigned to units (67.1, 121.1); incorrect collection and removal efficiencies were applied to control technologies (75.1, 107.1, 75.1, 129.1); an incorrect number of units was used in the baseline calculations (87.1, 109.1, 138, 97.1, 127.1, 112.1); EPA used an incorrect sludge feed rate (106.1, 111.1, 121.1, 83.1, 90.1, 121.1); and EPA used an incorrect annual SSI run time (93.1, 94.1, 101.1, 97.1, 127.1, 102.1, 116.1).

Numerous commenters (68.1, 76.1, 85.1, 105.1, 110.1, 129.1, 134.1) noted that EPA used uncorrected flue gas flow rates and flow rate factors with pollutant concentrations corrected to 7% O_2, resulting in an overestimation of baseline emissions. One commenter (76.1) stated that ERG used pollutant concentration data corrected to 7% O_2 and multiplied by the actual stack gas flow rate which was not corrected to 7% O_2, severely over-estimating the annual mass emission rate. A number of commenters (76.1, 97.1, 127.1, 102.1, 116.1, 85.1) stated EPA used incorrect sludge feed rate factors. Two commenters suggested EPA use a factor incorporating sludge produced per capita basis (76.1). Other commenters (129.1, 85.1) claimed that EPA's air flow rate factors (129.1, 85.1) were incorrect. A commenter (76.1) stated that a 75% capacity utilization factor was not appropriate and that EPA must allow for 100% utilization of assets citizens have paid for to meet future capacity needs. However, another commenter (97.1, 127.1) pointed out that operating conditions for POTW and their incinerators are significantly below the design capacity to handle the large swings in influent flow rate due to wet weather events and by assuming a 75% capacity factor, emissions were overstated. One commenter (76.1) stated that

EPA should use available population data to insure the default factors are appropriate for the units in questions. Another commenter (71.1) argued that the rule has been rushed, adding there was little data to support the proposed rule and little time for a formal information collection request by EPA. The commenter (71.1) added to save time, EPA has used assumptions and other factors from other rules for units that have no similarity to SSIs and that burn wastes that are not similar to sewage sludge resulting in overestimation of emissions. Another commenter (138) stated that EPA made a number of incorrect assumptions concerning the operations of sewage sludge incinerators that resulted in a substantial overestimation of the quantity of sewage sludge being incinerated in the United States, the current baseline emissions, and the potential reduction emissions due to implementation of emission guidelines. One commenter (91.1) stated that because of overestimation of emissions, the need for additional controls from SSIs as a whole has been overstated. At least two commenters (97.1, 127.1, 129.1) noted that errors existed in the dataset that are an indication of inadequate quality assurance and quality control on the data in the database; the commenters (97.1, 127.1) requested that EPA perform a rigorous quality assessment of the data prior to setting standards.

Response: EPA has incorporated corrections to the inventory and calculation inputs provided by the commenters where applicable. EPA has also revised the calculation of baseline emissions by revising the defaults assigned to SSI units where information was not available. Defaults were necessary to be assigned because, even after new data were received in comments, a significant number of units did not have data on sludge capacity, flue gas flow rates, etc. Several default parameters are based on available service area population data. A detailed description of the methodology used to fill data gaps is presented in the memorandum "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology"(EPA-HQ-OAR-2009-0559). A detailed discussion of the methodology used to estimate baseline emissions for the final standards is presented in the memorandum "Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units"(EPA-HQ-OAR-2009-0559). To address the issue of capacity vs actual feed rates, an upper and lower bound for each pollutant was calculated. The upper bound represents an estimation of potential emissions if the sludge feed rate was at the dry sludge capacity of each unit. EPA estimated the potential emissions because the amount of wastewater treated (and sludge produced) may vary significantly based on changes in population or sources of wastewater. Facilities have the potential to burn up to their units permitted capacity

although they may not be doing so currently. The lower bound represents an estimation of emissions based on sludge feed rates, rather than sludge capacity.

Comment: Several commenters (106.1, 58, 61.1, 63.1, 67.1, 68.1, 69.1, 70.1, 71.1, 73.1, 74.1, 75.1, 78.1, 81.1, 83.1, 87.1, 90.1, 94.1, 97.1, 127.1, 101.1, 102.1, 103.1, 105.1, 106.1, 107.1, 109.1, 110.1, 111.1, 112.1, 114.1, 115.1, 116.1, 118.1, 120.1, 126.1, 132.1, 136.1, 138) stated mercury emissions had been estimated to be three times greater than a 1997 Mercury Study Report to Congress provided by the Agency released before several mercury point sources implemented measures to reduce the amount of mercury disposed of in wastewater. Other commenters (75.1, 85.1, 97.1, 127.1, 110.1, 134.1, 138) referenced a report published in 2009 by the Water Environment Research Foundation which stated SSIs collectively emit less than 1 ton of mercury each year. A commenter (97.1, 127.1) argued EPA may have miscalculated the mercury content of sewage sludge because the Agency's data are not representative of typical mercury values. One (76.1) commenter contends that the mercury emissions data for multiple hearth incinerators are overestimated by 77%, and stated that the baseline emission calculations significantly increase the $6,150/1b mercury cost of compliance for the beyond-the-MACT-floor mercury limit. Commenters (76.1, 134.1) noted EPA should recalculate or review the emissions baselines, and commenters (76.1, 134.1) added EPA should adjust the beyond-the-MACT-floor for mercury as warranted. A commenter (85.1) argued that based on EPA's errors in estimated baseline emissions, EPA must re-evaluate baseline emissions, the MACT floor assessment, and the beyond the floor assessment.

Response: EPA has incorporated corrections to the inventory and calculation inputs provided by the commenters where applicable. The corrections included using flowrates corrected to 7% O_2 for calculating baseline emissions. EPA has also revised the calculation of baseline emissions by revising the defaults assigned to SSI units where information was not available. Defaults were necessary to be assigned because, even after new data were received in comments, a significant number of units did not have data on sludge capacity, flue gas flow rates, etc. A detailed discussion of the methodology used to estimate baseline emissions for the final standards is presented in the memorandum "Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units"(EPA-HQ-OAR-2009-0559). The revised mercury baseline emissions estimates range from 0.9 to 1.2 tons per year. The upper bound represents an estimation of potential emissions if the sludge feed rate was at the dry sludge capacity of each unit. We estimated the potential emissions because the amount of wastewater treated (and sludge

produced) may vary significantly based on changes in population or sources of wastewater. Facilities have the potential to burn up to their units permitted capacity although they may not be doing so currently. The MACT floor and beyond-the-floor assessments have also been revised, as appropriate, base on this revised data. Please see the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for further detail. For the final rule we have decided select the MACT floor emission limits for all pollutants.

8.2 Comments on CO baseline emissions

Comment: At least one commenter (145.1) stated that the CO concentrations assigned to MH incinerators with afterburners is incorrect. The commenter (145.1) noted that a reduction efficiency was not assigned to MH incinerators with afterburners because data were not available to determine a percent reduction value. The commenter (145.1) argues that the low CO emissions levels achieved by MH incinerators equipped with afterburners or RTOs have not been considered in the best performing 12% of the units. The commenter (145.1) notes that the CO emissions assigned to the MH incinerators equipped with detached afterburners or RTOs have the same CO emission level of the rest of the MH incinerators; hence, all the MH incinerators can meet the best performing 12% MH incinerators without requiring any improvements. The commenter (145.1) states that the CO emissions from the detached afterburners or RTOs should be established and included in the determination of the 12% best performing MH incinerators for CO emissions.

Response: The MACT floor limit for CO was based only on actual emissions data collected. The MACT floor includes CO emissions data from the best-performing 12 percent of sources in each subcategory. To estimate baseline emissions, EPA had to make assumptions to fill in gaps for the units having no data. A detailed discussion of the methodology used to estimate baseline emissions for the final standards is presented in the memorandum "Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units"(EPA-HQ-OAR-2009-0559).

8.3 Uncontrolled Emissions are Incorrect

Comment: A commenter (145.1) stated the Table 3-2 in the June 2010 memorandum from ERG to EPA titled "Emission of Baseline Emissions from Existing Sewage Sludge Incineration Units" cannot be correct. The commenter (145.1) stated that, in FB incinerators, unless they are equipped with waste heat boilers, all the ash from burning of sludge and a small part of bed material (usually silica) is elutriated from the incinerators. The commenter (145.1) added that most of the FB incinerators are hot-windbox design and equipped with air preheaters (heat exchangers). The commenter (145.1) noted that because the preheaters used for FB incinerators are designed not to capture any bottom ash, all of the ash is exhausted into the wet scrubbers as uncontrolled emissions. In MH incinerators, only 10% to 20% of ash is carried away with flue gases, and the remaining 80% to 90% is discharged as bottom-ash. Therefore, the commenter (145.1) asserted, the uncontrolled PM concentration in flue gases from the MH incinerator would be about 20% of the concentrations found in the FB incinerators. The commenter (145.1) stated that in Table 5 (Ref EPA-HQ-OAR-0559-2009-0145.1 "Uncontrolled Emissions"), the emission data used in the development of the MACT standards is partially represented. The commenter (145.1) stated that although the use of higher excess air in MH compared to FB incinerators dilutes the metal concentrations for some amount, the ratio of the FB-to-MH uncontrolled emission ratio should be about 100/20 or 5. The commenter compares this to Table 3-2 in the referenced EPA document, where this ratio is 249/722 or 0.3.A similar argument can be made for the Cd, Pb and Hg emissions. The commenter questioned why the average uncontrolled emission for Cd from the MH incinerators is 21 times more than the emissions from FB incinerators, and if the FB incinerators used in the database were located in residential areas, or if MH furnaces were located in the industrial areas. The commenter asserted that regardless of any possible explanation, the Average Uncontrolled Concentrations presented in Table-3 cannot be correct.

Response: At proposal we estimated uncontrolled emissions simply as a means to determine baseline emissions for units we did not have data on. We have modified our analysis since proposal. Please refer to the memorandum “Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units”(EPA-HQ-OAR-2009-0559). For those sources where we are still using this analysis, we maintain its appropriate to determine baseline emissions if consistently applied while back-calculating to uncontrolled emissions, then forward

calculating to baseline emissions. It has been used for other combustions sources and there's no reason it should be different for SSI's.

8.4 Metals Content of Sludge

Comment: Several commenters provided sewage sludge metals content (80.1, 126.1, 105.1, 126.1, 132.1). Another commenter (97.1, 127.1) claimed EPA's mercury emissions estimates for their facilities were nearly three times higher than the actual concentration of mercury in their sludge in 2009. Commenters (105.1, 54.1, 60.1) indicated a decreasing trend in the amount of mercury present in sewage sludge due to source reduction measures. Additionally, a commenter (70.1) indicated that they have not discovered any measurable amount of mercury within their influent, effluent or sludge and sampling continues to result in minute detectable amounts in the parts per billion and mercury has played no major role in the emission from the incinerator. Another commenter (132.1) stated that under their NPDES permit and Industrial Pretreatment program from the State of Michigan, they monitored mercury in the wastewater treatment plant effluent for 13 consecutive months and was exempted from the mercury minimization program. In addition, the commenter (132.1) said they have been monitoring mercury in sludge monthly in compliance with the current air permit as well as periodic stack testing of air emissions. The commenter (132.1) provided their sludge metals data.

Response: EPA has revised our estimate of mercury emissions based on corrections provided by commenters. A detailed discussion of the methodology used to estimate baseline emissions for the final standards is presented in the memorandum "Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units"(EPA-HQ-OAR-2009-0559).

8.5 EPA Missing Data

Comment: A commenter (83.1) claimed EPA recognized the need for additional data such as utilized capacity, permitted capacity, air flow rate, and operational hours. The commenter argued that it is unreasonable for EPA to move forward with its Proposed Rule when it is missing this type of information. The commenter (83.1) also added that EPA has made a number of data errors in its Proposed Rule and that EPA cannot possibly issue this rule in good faith knowing its numbers are so skewed and any attempt to do so would violate the most basic

principles of administrative process. [The commenter's supporting statements have been accounted for in other comments/responses]

Response: EPA recognizes that with any rulemaking there will likely be data gaps. EPA requested additional data to fill in data gaps and received some additional data along with some data revisions during the comment period. We have incorporated corrections to the inventory and calculation inputs provided by the commenters where applicable. In some cases, commenters did not provide information sufficient for us to revise the inventory or calculation inputs for the commenter's facility.

We have also revised the calculation of baseline emissions by revising the defaults assigned to SSI units where information was not available. Defaults were necessary to be assigned because, even after new data were received in comments, a significant number of units did not have data on sludge capacity, flue gas flow rates, etc. A detailed discussion of the methodology used to estimate baseline emissions for the final standards is presented in the memorandum "Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units"(EPA-HQ-OAR-2009-0559).

9.0 FACILITY/UNIT SPECIFIC INFORMATION AND DATA CORRECTIONS

9.1 General Facility Information

Comment: Several commenters (58, 61.1, 63.1, 67.1, 68.1, 69.1, 70.1, 71.1, 74.1, 75.1, 76.1, 78.1, 81.1, 85.1, 87.1, 90.1, 93.1, 94.1, 96.1, 101.1, 103.1, 105.1, 106.1, 107.1, 109.1, 111.1, 112.1, 113.1, 114.1, 115.1, 117.1, 118.1, 120.1, 121.1, 126.1, 129.1, 132.1, 138, 72.1) provided EPA with information regarding the population served and the amount of wastewater received by their wastewater treatment facilities and SSIs. Many commenters noted annual tons of sewage sludge incinerated (58, 61.1, 63.1, 67.1, 68.1, 69.1, 70.1, 74.1, 81.1, 85.1, 87.1, 93.1, 94.1, 101.1, 103.1, 105.1, 106.1, 107.1, 109.1, 111.1, 112.1, 113.1, 114.1, 115.1, 117.1, 118.1, 120.1, 121.1, 126.1, 129.1, 132.1), hourly incineration rates (61.1, 62.1, 67.1, 69.1, 71.1, 74.1, 76.1, 80.1, 93.1, 97.1, 127.1, 117.1, 121.1, 129.1, 138, 112.1), incinerator capacity (61.1, 62.1, 67.1, 71.1, 117.1, 129.1, 109.1), the number and type of incinerators at their facilities (58, 61.1, 62.1, 63.1, 67.1, 68.1, 69.1, 70.1, 71.1, 73.1, 75.1, 76.1, 80.1, 81.1, 85.1, 87.1, 93.1, 94.1, 94.1, 52.15, 101.1, 103.1, 105.1, 106.1, 107.1, 109.1, 111.1, 112.1, 113.1, 114.1, 115.1, 117.1, 118.1, 120.1, 121.1, 122, 126.1, 129.1, 132.1, 94.1, 138, 144), the exhaust gas parameters (61.1, 62.1, 67.1, 74.1, 76.1, 117.1, 121.1, 132.1, 112.1, 109.1) and associated control equipment (61.1, 73.1, 75.1, 101.1, 118.1, 121.1, 122, 126.1, 144, 129.1). Commenters also provided typical annual operating hours (61.1, 62.1, 71.1, 74.1, 93.1, 94.1, 97.1, 127.1, 117.1, 129.1, 109.1) and ash-handling information (61.1, 67.1, 76.1, 138). A small number of commenters provided annual cost estimates (71.1) and fuel usage (76.1, 138) for their current sewage sludge incineration. Numerous commenters (48.1, 61.1, 68.1, 80.1, 81.1, 85.1, 105.1, 120.1) noted recent or planned upgrades to their wastewater treatment facilities and sewage sludge solids handling equipment.

Response: All additional data concerning operating parameters or unit or facility characteristics were incorporated where applicable into a revised data set. A more detailed description of the revised data and how it was used in filling the data gaps for subsequent analyses can be found in the memorandum "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology"(EPA-HQ-OAR-2009-0559).

9.2 Heat Recovery and SSI Units

Comment: One commenter (73.1) noted heat recovery units had been installed on their SSI units. The commenter (73.1) noted that the heat recovery systems provide heat or electricity in excess of the SSI units' needs and the heat or electricity can be utilized by the WWTP or surrounding community. Two commenters (76.1, 138) also noted a heat recovery unit installed on their SSI unit and that the captured energy was used within the wastewater treatment process.

Response: This data was not required for any of our analyses and was therefore not extracted into the database.

9.3 Incineration for Other WWTP

Comment: Several commenters (61.1, 68.1, 73.1, 101.1, 105.1, 126.1) stated they provide incineration for numerous other wastewater facilities in proximity to their SSI unit.

Response: EPA thanks the commenter for their input.

10.0 MACT FLOOR DETERMINATION METHODOLOGY

10.1 Feed Operational Variability has not been taken into Account

Comment: Several commenters (97.1, 127.1, 80.1, 67.1, 108.1, 138, 137.1) claimed that emissions variability has not been appropriately accounted for in developing the proposed standards. Many commenters (97.1, 127.1, 108.1, 73.1, 137.1, 134.1) stated that EPA has not considered differences in feed characteristics in developing the standards for new incinerators. Other commenters (85.1, 97.1, 127.1, 105.1, 134.1) noted that sludge variability, operational variances, and seasonal temperatures were not factored into the criteria for developing standards. One commenter (85.1) noted that, given these variables, the same unit may not meet the limit in future tests.

Several commenters (84.1, 119.1, 97.1, 127.1, 105.1, 129.1, 134.1) rejected EPA's determination that variations in the waste of SSIs are not as great as the variations in waste burned by other incinerators and is a homogenous mixture. One commenter (97.1, 127.1) stated that unlike other types of industrial and commercial incinerators, many different entities and individuals have unlimited access to the POTW through thousands of toilets, sinks and drains that flow into the treatment works, resulting in highly variable and often unpredictable spikes in concentrations in the waste stream. Additionally, the commenter (97.1, 127.1) noted that POTW inlet concentrations vary based on the nature and type of dischargers and significant regional and seasonal variability that is not captured by EPA’s dataset. The commenter (97.1, 127.1) stated that without the use of long-term data, this variability makes numeric technology-based limits impractical and infeasible. Commenters (105.1, 137.1) noted that many facilities receive a range of materials for combustion including primary sludge, waste activated sludge, digested sludge, septage, grease trap pumpings, grease skimmed from headworks and primary system. Furthermore, the percentage of each of these streams in the overall stream varies over the seasons as well as throughout the day. The commenters (105.1, 137.1) noted that these materials have very different heat contents, are present at widely varying concentrations in the overall sludge over time, and can separate in storage, further affecting SSI feed characteristics. Other commenters (97.1, 127.1, 134.1) stated that different treatment methodologies result in chemical and biological differences in the composition of sewage solids that must be considered.

Some commenters (97.1, 127.1, 134.1) stated concerns regarding the variable composition of biosolids. Several commenters (80.1, 97.1, 125, 127.1, 145.1, 67.1, 105.1) noted

that metals (including mercury, cadmium, and lead), chloride, and sulfur concentrations may vary based on sludge characteristics and should be taken into consideration when setting standards. Specifically, some commenters (97.1, 127.1, 145.1) claimed that the sludges produced at the wastewater plants located in the industrial areas have higher concentration of certain pollutants (e.g., Cd, Pb, Cr, Ni) than the sludges generated in the plants located in the residential areas. At least one commenter (145.1) provided publications to substantiate this claim. Another commenter (97.1, 127.1) provided monthly average sewage sludge content of cadmium, lead, and mercury at two of its POTW facilities to assert that the range of average metal concentrations may vary by a factor of three or more. The commenter (97.1, 127.1) was of the opinion that other POTWs face similar variability at this level or greater and that a similar degree of variability applies to other constituents as well. Two commenters (105.1, 137.1) stated that the inlet metals content can vary over time by over an order of magnitude within a single POTW as well as among different POTWs, based on the industries discharging to the POTW. The commenters (105.1, 137.1) provided data for metal concentrations land application system surveys done in Maine, New York, Pennsylvania and Vermont. One commenter (134.1) referenced a January 2009 EPA report, "Targeted National Sewage Sludge Survey Statistical Analysis Report", specifically stating that there is a large variability in the level of mercury in biosolids. The commenter (134.1) noted that a large number of samples are required to characterize both the level of mercury and the potential variability in the feed stock (which provides the design criteria for the selected air pollution control equipment). Some commenters (105.1, 137.1) remarked that EPA did not consider the actual metals removal efficiency for the SSIs in the proposed rule, and argued that the "best performing" SSI for metals may have been based on a low metals inlet concentration instead of the removal of the metal by pollution control equipment. One commenter (125) suggested EPA survey facilities for metal concentrations in the incoming biosolids. The commenter (125) stated that metal concentrations for various waste water treatment plants can vary for a region, as well as, for a specific facility, therefore the emission standards for these metals requires some flexibility. The same commenter (125) provided Southern California biosolids data showing concentrations that range from 1-20 mg/kg for cadmium, 7-66 mg/kg for lead, and 1-6 mg/kg for mercury; and showed an example of how facilities that encounter metal concentrations in the upper end range will face difficulty meeting the proposed standard.

Response: Please refer to Section V.C of the preamble.

Comment: One commenter (97.1, 127.1) stated that EPA could not use justify that sewage sludge is homogeneous because the Part 503 regulations cap sludge concentrations. The commenter (97.1, 127.1) stated that the Part 503 regulations do not address all of the Section 129 pollutants (PM, opacity, SO_2, HCl, NO_x and dioxin/furans), and do not account for the variability of sulfur, chlorine and nitrogen concentrations in sewage sludge, which have a direct effect on the amount of SO_2, HCl, and NO_x generated when the sludge is incinerated. The commenter (97.1, 127.1) also noted that while Part 503 establishes risk-based limits for lead and cadmium, these limits are different for every POTW based on feed rates, stack heights, and exhaust flow rates and POTW performance varies significantly depending upon the sources of these compounds in the sewage system. The commenter (97.1, 127.1) argued that the actual performance for all POTWs is far below the health-based limits established under Part 503 and may vary by a factor of 100 or more without approaching the Part 503 limit. Therefore, the commenter (97.1, 127.1) asserted that EPA cannot rely on Part 503 standards as evidence of homogeneity in waste streams.

Response: Please refer to Section V.C of the preamble..

Comment: Several commenters (97.1, 127.1, 108.1, 105.1, 137.1) stated that EPA could not appropriately account for variability based on the limited number of performance tests in the collected data; one commenter (105.1) asserted that while one or two performance tests may account for the variability for a given feed composition or set of operating parameters, it cannot account for the full range of expected feed compositions and operating parameters that a unit may regularly encounter. At least one commenter (97.1, 127.1) suggested that EPA consider the Part 503 metals data that POTWs submit to the Agency regularly to account for variability when setting emission limits. The commenter (97.1, 127.1) noted that EPA has requested additional sewage sludge metals content information, but has restricted its request to metals content information collected during stack tests. The commenter (97.1, 127.1) noted that EPA must also account for variability for the compounds not regulated by Part 503 prior to setting the new source limit.

Response: Please refer to Section V.C of the preamble. A variability factor can only be developed based on sources in the top 12 percent.

10.2 Criticism's of EPA's Selection of Facilities for the MACT Floor

Comment: Several commenters (84.1, 119.1, 97.1, 127.1, 108.1, 107.1, 122, 123, 138, 145.1, 95.1, 65.1, 79.1, 101.1, 109.1, 76.1, 134.1) stated that EPA has not collected sufficient data or followed the requirements of the Clean Air Act (CAA) in establishing the Maximum Achievable Control Technology (MACT) floor for the SSI units. Multiple commenters (97.1, 127.1, 95.1, 79.1, 76.1, 110.1, 138) rejected EPA's selection method, stating the selection method surveyed facilities in only nine municipalities. At least two commenters (97.1, 127.1, 102.1, 116.1) posed that EPA limited the ICR to nine entities because collecting information from ten or more entities would have triggered a more rigorous OMB review; one of these commenters (102.1, 116.1) stated that EPA actually selected 10 wastewater treatment plants (sources) for the development of the Proposed Standard, and has therefore knowingly bypassed the OMB process. Many commenters (84.1, 119.1, 97.1, 127.1, 79.1, 76.1, 134.1) suggested that the selection method limited EPA to insufficient data to set the standards and that EPA incorrectly relied on statistical techniques to utilize this data to set the MACT floor. At least two commenters (97.1, 127.1) specifically argued that by limiting the inventory to nine POTWs "expected to have the lowest emissions based on the type of unit and the installed air pollution controls", EPA could not reliably use a statistical analysis that presumes the data is a random sample representative of the entire source category or subcategory. One commenter (97.1, 127.1) stated that due to the selection method and insufficient data collection, EPA has created more stringent emission limits that constitute "unlawful beyond-the-floor MACT standards".

Several commenters (97.1, 127.1, 95.1, 65.1, 79.1, 76.1, 102.1, 116.1, 111.1) specifically criticized EPA's method of selection of the top 12 percent of units for each source category. Many of these commenters (97.1, 127.1, 102.1, 116.1, 95.1, 79.1, 101.1, 76.1) were of the opinion that EPA has not meet the requirements of the statute, which requires that MACT be no "less stringent than the average emissions limitation achieved by the best performing twelve percent of units in the category (excluding units which first met lowest achievable emissions rates 18 months before the date such standards are proposed or 30 months before the date such standards are promulgated, whichever is later)." Multiple commenters (84.1, 119.1, 97.1, 127.1, 102.1, 116.1, 95.1, 76.1, 126.1, 134.1) noted that EPA had data for less than 12 percent of the best-performing sources in the source categories. Thus, several commenters (95.1, 109.1, 134.1) asserted that EPA does not have the requisite data required by Section 7429(a)(2) to conduct a legitimate MACT floor analysis. These commenters (84.1, 119.1, 95.1, 101.1, 76.1, 134.1) noted

that several respondents did not provide emission data for all pollutants, and therefore EPA only has actual emissions data from only five to 19 MH facilities (based on the pollutant). At least two commenters (90.1, 138) noted that the proposed standards for new incinerators were based on a very limited amount of air emissions test data obtained from only three POTWs utilizing fluidized bed sewage sludge incinerators. One commenter (90.1) expressed concern that calculating MACT floors on such a small sample size would result in future incinerators not likely being able to meet the new standards even if operating as designed. Conversely, one commenter (134.1) recommended that EPA use the performance from the three units in St. Paul, MN as the floor for best unit technology; the commenter (134.1) remarked that these units have the most data, have identical equipment, and have been tested at several times so that variations in feed sludge may be observed. At least one commenter (76.1) requested justification that the permit data used for 9 MH facilities to complete the inventory reflects the 12% best performing units.

Other commenters (102.1, 116.1, 138, 95.1) stated that EPA has not justified that the units selected accurately reflect the top 12 percent. One commenter (102.1, 116.1) asserted that individual sources, not units, must be utilized; the commenter (102.1, 116.1) noted that the composition of sludge varies greatly from source to source, therefore, utilizing multiple units at one source skews the data for setting the MACT Standard. Another commenter (102.1, 116.1) expressed concern that the two units utilized to set the baseline possess advanced technology and control systems not utilized at any of the remaining top 12%.

Commenters (107.1, 79.1, 76.1) further stated that the agency’s method does not substitute for the more complete information the agency would have received from a more thorough data-collection effort. Several commenters (85.1, 97.1, 127.1, 107.1, 65.1, 75.1, 79.1, 109.1, 76.1, 134.1) requested that the agency collect new data and recalculate the MACT floor. At least one commenter (76.1) requested that EPA incorporate data that was submitted after the ICR deadline into the MACT analysis process. Some commenters (129.1, 129.1) stated that they could provide additional data for EPA. One commenter (132.1) suggested that because the proposed standards are based on a limited data set of SSI units with advanced controls, the standards should be considered "interim standards" and be finalized only after sufficient number of facilities are built with advanced controls and data made available for EPA's use. Multiple commenters (65.1, 79.1, 101.1, 76.1, 126.1) requested that EPA reanalyze the MACT floor based

on a complete data set from each of the best-performing 12%, containing data for all nine of the critical pollutants.

Response: Please see Section V.C of the preamble for EPA's response to these comments.

Comment: Some commenters (84.1, 119.1, 79.1, 101.1, 76.1) claimed that EPA cannot consider statistical analysis and control device performance to determine which sources would be the "best-performing" units. Commenters (84.1, 119.1, 95.1) stated that the agency did not provide a rational basis or demonstrate with substantial evidence that the selected units were the best-performing units. Some commenters (84.1, 119.1, 95.1) argued that EPA may not set the floors based solely on the performance of pollution control technology, citing Cement Kiln Recycling Coalition v. EPA, 255 F.3d 855. 863 (D.C. Cir. 2001). One commenter (84.1, 119.1) noted that several units that are not among those EPA identified as the best performers will not have to install control technology or otherwise reduce their emissions because their emission levels already are at or below the agency's floor levels. In addition, several commenters (84.1, 119.1, 97.1, 127.1, 95.1, 65.1) asserted that SSI emission levels are affected not only by control technology but by other factors, including the contents of the sludge that a unit is burning, the fuels they use, the age and design of the individual unit, the specific quality and age of the control devices at individual units, the training and skill of the operators, and the care with which they run individual units. One commenter (76.1) argued that EPA cannot ignore non-technology factors that reduce HAP emissions, specifically citing that "EPA's decision to base floors exclusively on technology even though non-technology factors affect emissions violates the Act" (479 F. 3d at 883) and stating that EPA must consider upstream source control and waste diversion when setting standards. Another commenter (95.1) referred to the Brick MACT case (Sierra Club v: EPA, 479 F.3d 875, 884 (D.C. Cir 2007)), stating that although the Brick MACT alludes to the Agency having to set MACT standards under Section 112 based on lowest emissions, it did not require EPA to do so, and does not support developing floor standards based on lowest emissions. At least one commenter (134.1) noted that selecting the best-performing units on the basis of control devices that are "expected to have the lowest emissions" may not capture the best performing units, as performance is influenced more by operating parameters (some in the combustion system and some in the emissions control system) than on the particular technology employed. Two commenters (124.1, 82.1) recommended that EPA determine if the best-performing sources that provided the metals data are in communities or states that require

use of amalgam separators. The commenters (124.1, 82.1) posed that the best performing sources may not only be controlling mercury emissions through air pollution control devices, but may also benefit from lower mercury content in sludge due to use of amalgam separators. One commenter (80.1) stated that it is not clear if the difference in controlled Hg emissions from the test data from St Paul (with carbon injection/baghouse) and Ypsilanti (with fixed bed carbon adsorption) are due to differences in the effectiveness of the technologies or to differences in the uncontrolled concentrations.

Response: Please see Section V.C of the preamble for EPA's response to these comments. MACT floor limits are intended to reflect the best performing units, regardless of the types of controls used on the units. Refer to the memorandum "Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" (EPA-HQ-OAR-2009-0559) for a detailed discussion on how the UPL was calculated.

10.3 Pollutant by Pollutant Approach is Unreasonable

Comment: Several commenters (85.1, 97.1, 127.1, 67.1, 102.1, 116.1, 95.1, 109.1, 105.1, 105.1, 137.1, 134.1) stated that the pollutant-by-pollutant approach to determine the MACT floor is unreasonable. Commenters (97.1, 127.1, 80.1, 67.1, 95.1, 73.1, 109.1, 105.1, 137.1, 129.1, 134.1) stated that deriving the MACT floor for each pollutant based on the emissions levels achieved by the best-performing single unit for each pollutant is unrealistic and creates emissions standards that cannot be met by any single operating SSI unit.

At least one commenter (97.1, 127.1) argues that Section 129 specifies that emissions standards must be established based on the performance of "units" in the category or subcategory and that EPA's discretion in setting standards for such units is limited to distinguishing among classes, types, and sizes of units. The commenter states that the standards must be based on actual units and cannot be the product of pollutant-by-pollutant parsing; the commenter asserts that EPA does not have the authority to "distinguish" units and sources by individual pollutant, citing Sierra Club, 551 F.3d at 1028.

Another commenter (95.1) stated that the statutory provision for new sources states that MACT floor standards must be based on the emission controls achieved by the "best controlled similar unit." The commenter (95.1) infers that EPA has a duty to find the single best unit, citing Sierra Club v. EPA, 167 F.3d. 658, 665 (D.C. Cir. 1999), noting that use of the singular in the statutory language suggests EPA look to the single "unit with the best observed performance".

Furthermore, the commenter (95.1) provided text of an exchange between Senator Dole and Senator Durenberger (Senate Comm. on Environment and Public Works, 103d Cong., A Legislative History of the Clean Air Act Amendments of 1990 at 1118) regarding how EPA must select the best performing sources when confronted with differing technology that reduces different pollutants to different levels. The commenter (95.1) argued that EPA must set a standard that a requisite number of best performers can meet without installing upgraded air pollution control equipment, noting that this "amounts to a beyond the floor standard without consideration of the beyond the floor factors" (70 FR 59402, 59443, October 12, 2005). The commenter (95.1) stated that because the "pollutant-by-pollutant" methodology may result in best performing sources taking actions to meet the standards, it is unlawful. The commenter (95.1) provided an analysis of the available data and stated that none of the units in EPA's database simultaneously achieve all the proposed existing source or new source standards; the commenter (95.1) concluded from this analysis that EPA has improperly circumvented the Section 129 requirements for establishing "beyond-the-floor" standards because the "floor standards would force industry-wide technological upgrades without consideration of the factors (cost and energy in particular) which Congress mandated for consideration when establishing beyond-the-floor standards" (75 FR 63275). Similarly, at least two commenters (97.1, 127.1, 134.1) stated that because the proposed limits for each Section 129 pollutant could not be met by the best-performing sources, that the limits were technologically unachievable. At least four commenters (80.1, 67.1, 105.1, 137.1) specifically stated that based on a review of EPA's emissions database, 11 of 30 test data points would not comply with the Cd standard, 28 of 30 data points would not comply with the Pb standard, 22 of 30 would not comply with the HCl standard, 6 of 6 data points would not comply with the D/F TMB or TEQ, 86 of 105 would not comply with the CO, and 8 of 15 would not comply with the NOx standard. At least one commenter (134.1) stated that even the units considered to have the most advanced emission control equipment (i.e., three units in St Paul, MN and one unit in Ypsilanti, MI) would be unable to comply with the proposed regulation.

Several commenters (85.1, 97.1, 127.1, 80.1, 95.1, 56.1, 65.1, 90.1, 105.1, 137.1, 129.1, 134.1) specifically claimed that EPA did not appropriately consider that emissions of NOx and CO are inversely proportional due to characteristics of combustion; therefore, no one new unit would be able to meet the new standards for both. Some commenters (97.1, 127.1) requested that EPA set limits based on the best performers for both pollutants simultaneously.

Response: Please see Section V.C of the preamble for EPA's response to these comments.

10.4 Criticisms of the Statistical Method

Comment: At least one commenter (86.1) asserted that EPA's determination of a normal distribution (using skewness and kurtosis) for the data used for the MACT floors is incorrect. The commenter (86.1) states that this determination is inconsistent with EPA's own Guidance for Data Quality Assessment Manual, which holds that it is more likely that environmental data are distributed log-normally. The commenter (86.1) further asserts that EPA's approach using skewness and kurtosis is not robust, criticizing EPA's application of the criteria to a limited sample size. The commenter (86.1) states that EPA must assume that the emissions data are non-normally distributed unless rigorous statistical analysis shows otherwise.

Response: EPA has reviewed the document referenced and agrees with the commenter that the referenced document shows that environmental data are more likely to be log-normally distributed than normally distributed. Based on this, EPA has modified the assumptions made when results of the skewness and kurtosis tests do not clearly show whether a normal or log-normal distribution better represents the data, or when there are not enough data to complete the skewness and kurtosis tests. In these cases, we have chosen to use the log-normal results for the final MACT floor calculation.

Comment: One commenter (84.1, 119.1) stated that EPA selected the best performers based on each source's lowest test result, but measured the best sources' actual performance based on their average test results. The commenter (84.1, 119.1) claimed that this approach, which uses different measures of performance, is inconsistent, irrational, and unexplained; the commenter (84.1, 119.1) stated that the same metric should apply for purposes of identifying the best performers and identifying those sources' actual performance. Additionally, the commenter (84.1, 119.1) asserted that by using the lowest test result to identify the best performers but the average test result to reflect their performance, EPA artificially increased the variability of the data on which it bases floors, without providing sufficient explanation for this approach.

Response: Please see Section V.C of the preamble for EPA's response to these concerns.

Comment: Several commenters (84.1, 119.1, 86.1, 145.1) rejected the statistical approach used by EPA to account for variability. Multiple commenters (86.1, 134.1) were of the opinion that EPA erred in using a UPL-based approach. At least one commenter (134.1)

specifically stated that the statistical approach was inappropriate for the small sample size, and reiterated the need for a more robust data set. Several commenters (86.1) offered alternative statistical approaches to account for variability and determining the MACT floor.

One commenter (84.1, 119.1) rejected EPA's application of the UPL to all test results for all sources in the top twelve percent. The commenter (84.1, 119.1) asserted that the CAA requires EPA to set floors reflecting the "average" emission level achieved by the best sources, and therefore the UPL approach is unlawful. Furthermore, the commenter (84.1, 119.1) asserted that although EPA may consider variability in estimating an individual source's actual performance over time, the agency may not account for differences in performance between sources except by averaging the emission levels achieved by the sources in the top twelve percent. The commenter (84.1, 119.1) was of the opinion that EPA erred by viewing the different emission levels achieved by different sources as "variability".

Similarly, other commenters (86.1) stated that the approach must consider variability from individual best performing sources independently and give equal weight to data from each source. Commenters (86.1, 95.1) expressed concern that EPA did not consider the number of data points for each unit when accounting for variability, but instead pooled and utilized data from all available test runs for the best-performing sources. One commenter (95.1) specifically noted that when calculating the standard for CO, the EPA database has one source with one test, one source with 13 tests, one source with 10 tests, one source with 12 tests, and one source with 2 tests. The commenter (95.1) remarked that EPA's method can only work properly if all the facilities have the same number of samples. The commenters (86.1, 95.1) asserted that EPA's analysis biases the MACT floor results by over-weighting the results for units that have more data available.

Another commenter (86.1) stated that using the UPL is inappropriate because the UPL adjustment incorrectly presumes that each test run result within a given 3-run test occurs randomly over the entire population distribution. The commenter (86.1) argued that EPA's UPL approach underestimates variability, noting that each of the three runs can only reflect conditions (sludge characteristics, condition of combustor, season of the year) affecting a unit's emissions at the time of the test, and that individual run results will not vary randomly across the entire distribution of emissions that would be observed over longer (monthly or annual) time periods.

Commenters (85.1, 95.1 75.1, 76.1, 76.1,110.1, 145.1, 134.1) also criticized EPA's approach of applying statistical analysis to single hourly test run results, stating that the average

from three test runs from 20 MHF units around the country should have been utilized to develop the standard. At least one commenter (95.1) stated that a single test run cannot constitute a valid test sufficient to accurately judge the emission level achieved by a particular unit and cannot be an accurate measure of the performance of the unit over time. One commenter (134.1) specifically claimed that the mercury variability data illustrate that the UPL approach is insufficient. The commenter (134.1) remarked that while the UPL statistical method may account for between-test variability, it cannot fully account for the variability of the mercury concentrations in the biosolids. The commenter (134.1) states that EPA's approach, which considers each test run to be a distinct data point, limits the geographic distribution of the data set to a very small sample. The commenter (134.1) referenced a January 2009 EPA report, "Targeted National Sewage Sludge Survey Statistical Analysis Report" (TNSSS report) which indicated high mercury concentration variability from plant to plant. The commenter recommended that EPA acquire additional emissions data or incorporate the biosolids mercury variability from the TNSSS report into the UPL method. These commenters (95.1, 76.1, 85.1) stated that the average of three one-hour tests is more representative of SSI steady state operations than any individual one-hour test.

Response: Please see Section V.C of the final SSI preamble for EPA's response to these comments. Additional rationale for the UPL is in the NPRM.

Comment: At least two commenters (97.1, 127.1, 86.1) remarked upon EPA's usage of a 95 percent UPL. One commenter (97.1, 127.1) stated that EPA should not use a 95 percent UPL, specifically, that to do so presumes that sources in the database would be expected to be out of compliance 5 percent of the time, which is contrary to the CAA requirement that MACT limits must be met at all times. Another (76.1) commenter stated that the 95 percent UPL results in even more stringent standards than listed using the 99 percent UPL. One commenter (86.1) stated that a 99th percentile UPL is inappropriate and inadequate. The commenter (86.1) requested that if EPA employs a statistical limit to set MACT floor emission limits, it should use the 99.9% limit. The commenter (86.1) noted that due to the small sample size, it is highly unlikely that the highest emissions and full variability have been observed, therefore, a 99.9% UPL is more appropriate than a 99% UPL. The commenter (86.1) additionally asserted that EPA cannot use a 95% UPL to calculate MACT floors on the basis that certain floors were higher than test data, stating that EPA failed to provide adequate rationale for reducing the UPL percentile to 95

percent. The commenter (86.1) remarked that EPA should revise its overall methodology and calculate the 99.9% UL as the MACT floors.

One commenter (84.1, 119.1) asserted that EPA failed to provide an explanation for its assumption that sources' actual emission levels will vary to the full extent of the 99th percent UPL. The commenter (84.1, 119.1) argues that the UPL does not consider an operator's efforts to limit variability in emissions by maintaining and operating the source carefully to control emissions, therefore, the UPL results in floors that do not reflect the best sources' actual performance.

Response: Please see Section V.C of the preamble for EPA's response to these comments. Regarding the comment that the UPL does not consider an operators efforts to limit variability in emissions, we lack data to determine if there any effects that need to be considered. The commenter did not provide any input on how such variability could be identified and incorporated into the UPL.

Comment: One commenter (84.1, 119.1) stated that EPA unlawfully rounded up its emission test results for the purpose of setting standards, even though the agency's policy is to round them down for the purpose of determining compliance. Specifically, EPA rounds up UPL values less than 100 to one significant figure, and rounds up UPL values between 100 and 1000 to two significant figures. The commenter states that this approach is inconsistent for setting standards. Another commenter (90.1) specifically stated that the significant digits used in calculating the CDD/CDF reduction exceed that supported by the uncertainty in the CDD/CDF calculation, therefore the reduction calculation is unreliable.

Response: All values were rounded up to two significant figures following EPA's procedures for calculation of the UPL based limits. Please refer to Section V.C of the preamble for further detail on the development of the final limits.

Comment: One commenter (134.1) specifically requested further justification regarding the exclusion of SO2 data from the Ypsilanti, MI facility. The commenter (134.1) remarked that the test method used for this facility was allowed by regulation, therefore, these data points should not have been discarded simply because they were higher.

Response: The SO_2 emissions from Ypsilanti were two orders of magnitude greater than all the other SO_2 test information. A review of the source test report indicated a different test method was used than used at all the other facilities providing SO_2 data. Additionally, the

reported emissions in the report could not be replicated using the raw data. For these reasons, the emissions data was not appropriate to use in calculating the MACT floors.

10.5 Treatment of Non-Detect Data

Comment: Some commenters (84.1, 119.1, 134.1, 53.1) rejected EPA's approach to non-detect data as unlawful, arbitrary, or flawed. At least one commenter (134.1) stated that the amount of non-detect data (more than 50%) was excessive and introduced uncertainty in the proposed MACT floor levels. Another commenter (84.1, 119.1) stated that assigning a value three times higher than the detection limit when the test result is below the detection limit substantially overestimates units' actual performance and does not reflect sources' emission levels.

Specifically, one commenter (53.1) stated that EPA's approach to non-detect data for HCl and CDD/CDF was flawed. Some commenters (90.1, 134.1) claimed that the CDD/CDF limits were likely too high, based on the use of non-detect data. One of these commenters (90.1) argued that given the high number of non-detects, there is no evidence to support the regulation of CDD/CDF from SSI units. Another commenter (132.1) expressed concern over the treatment of non-detect data from pollutants other than HCl and D/F, which were not discussed in the preamble to the proposed rule.

Some commenters (53.1) stated that EPA's selection of the highest detection limit reported in the data set is based on an erroneous assumption that the detection limit is a function of the pollutant emission rate. Furthermore, the commenter (53.1) asserted that by using the data from the low-emitting sources and ignoring the data from sources with higher emission rates, EPA biased its analysis. The commenter (53.1) also stated that the non-detection values used by EPA in its proposal do not account for sources of error associated with sample collection and handling, which should be considered in establishing the detection limit of a source test method. The commenter (53.1) suggested alternative approaches for calculating the MACT floor for pollutants with a high number of non-detects.

One commenter (95.1) completely rejected EPA's use and adjustment of the detection limit (DL) in the data used to set the standards. The commenter (95.1) stated that EPA should use the Reporting Limit (RL), or the lowest value at which a laboratory analytical instrument is calibrated, instead of adjusting the detection DL. The commenter (95.1) argues that the RL is superior to the DL because the RL is a quantification level includes an acceptable calibration

point. The commenter (95.1) notes that use of the RL will eliminate the need to include analytical variability because the data is at or near the detection limit. The commenter (95.1) states that if the data reported is not based on an RL, the quality of the data is not adequate to set standards and other data must be used.

At least one commenter (95.1) stated that the quality of the data EPA used to set the floor standard for total chlorine emissions is not sufficient to set standards at this level. The commenter (95.1) expressed that facilities would not be able to demonstrate compliance with the standard as proposed. The commenter (95.1) expressed concern that the low values in the EPA database may be biased or inaccurate, noting that Method 26A suffers from a negative bias at low concentrations (< 20 ppm) , especially when used in stacks with significant moisture contents (this problem is more pronounced at HCI concentrations in the low ppm range). The commenter (95.1) further noted that a number of sewage sludge incinerators control chlorine emissions with wet scrubbing systems that will introduce moisture into the stack gas and affect sampling results. The commenter also stated that alkaline particulate matter collecting on the filter upstream of the measurement impingers would also result in a negative bias, and noted that wet scrubbers typically use caustic to neutralize acid gases that could entrain HCl prior to sampling.

Another commenter (95.1) stated that the stack sampling methods utilized to determine compliance with the chlorine standards were not reliable and therefore unusable to set the standard. The commenter (95.1) stated that the precision and accuracy of Methods 26, 26A, 0050, and 0041 are lower at concentrations below 5 ppm. The commenter (95.1) further argued that while Method 26A suggests a theoretical "detection limit" of 0.08 ppm for the combined HCI and Cl2 based on the analytical measurement only, in practice, laboratories have found that actual defensible analytical reporting limits are approximately 5 to 10 times higher (i.e., 0.4 to 0.8 ppm). The commenter (95.1) suggests that EPA either discard the data from sources reporting emissions below 5 ppmv when developing a numeric standard, or find a way to compensate for the known negative bias in the data.

Response: We agree that at very low emission levels where emissions tests result in non-detect values, the inherent imprecision in the pollutant measurement method has a large influence on the reliability of the data underlying the MACT floor emission limit. Because of sample and emission matrix effects, laboratory techniques, sample size, and other factors, method detection levels normally vary from test to test for any specific test method and pollutant

measurement. The confidence level that a value measured at the detection level is greater than zero is about 99 percent. The expected measurement imprecision for an emissions value occurring at or near the method detection level is about 40 to 50 percent. Pollutant measurement imprecision decreases to a consistent level of 10 to 15 percent for values measured at a level about three times the method detection level. The approach EPA has used to account for measurement variability begins by defining a method detection level that is representative of the data used in the data pool. The first step in the approach is to identify the highest test specific method detection level reported in a data set that is also equal to or less than the average emission calculated for the data set. This approach has the advantage of relying on the data collected to develop the MACT floor emission limit, while to some degree, minimizing the effect of a test(s) with an inordinately high method detection level (e.g., the sample volume was too small, the laboratory technique was insufficiently sensitive or the procedure for determining the detection level was other than that specified). The second step is to determine the value equal to three times the representative method detection level and compare it to the calculated MACT floor emission limit. If three times the representative method detection level were less than the calculated MACT floor emission limit, we concluded that measurement variability is adequately addressed, and we did not adjust the calculated MACT floor emission limit. If, on the other hand, the value equal to three times the representative method detection level was greater than the calculated MACT floor emission limit, we concluded that the calculated MACT floor emission limit does not account entirely for measurement variability. We therefore used the value equal to three times the method detection level in place of the calculated MACT floor emission limit to ensure that the MACT floor emission limit accounts for measurement variability and imprecision.

We found that none of the alternative approaches for determining emissions limits suggested by the commenters were as suitable, consistent, clear, or easily-applied as our procedures; therefore, we did not incorporate their use in this rule. With regards to the reporting limit (RL), no standard method defines the reporting limit, so differing laboratories have developed individual reporting limits using owner-defined criteria. The arbitrary way in which reporting limits were and are developed prevented their use in determining emissions limits. In contrast, our procedures for determining emissions limits rely on the detection capabilities of the laboratories' instrumentation along with an adjustment, when necessary, that accounts for errors, including those associated with measurement uncertainty, sample collection, and handling.

Please refer to the memorandum "Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" (EPA-HQ-OAR-2009-0559), for a discussion on how non-detect values were handled for all pollutants.

Comment: One commenter (134.1) requested that EPA validate that each facility in the inventory properly determined the associated method detection limits, particularly for data reported near or at the detection limit for a given test method. Another commenter (134.1) requested that the data used to calculate the MACT floor levels be examined to verify if the instruments were properly calibrated to verify the accuracy of the data; the commenter (134.1) further asserted that results reported below the lowest calibration point should be not be considered in the data set, as they are unreliable.

Response: EPA acknowledges the commenters' concerns regarding an additional validation of data reported in the ICR or examination of instrument calibration used to determine data reported in the ICR. Owners or operators who received ICRs were required to obtain and report their data in a specific manner; moreover those owners or operators were required to certify that their data were collected, determined, and reported accurately. Given these requirements, we have no reason to believe data reported near or at the detection limit for a given test method, or any other data, were determined improperly. We do not agree that data reported lower than the calibration point but higher than the detection level should be excluded from the data set; the inability of current instrumentation to be calibrated at lower levels has no impact on the expected distribution of emissions values. Values below the calibration level, as well as below the detection level, exist, and their elimination would bias the data set high. Our current procedure accounts for this bias by including those data between the calibration and detection levels, and adjusting the resulting emissions limit as necessary to account for errors such as instrumentation insensitivity.

10.6 Comments on NO_x Limits

Comment: Several commenters (75.1, 134.1, 80.1, 102.1, 116.1, 138,) are concerned that existing units will not be able to meet the proposed NOx emission limits. At least two commenters (102.1, 116.1, 138) stated that the NOx emissions limits do not correctly account for the variability of sludges that will enter into incinerators. Another commenter (134.1) also argued that NO_x emissions can increase significantly with fluctuations in the sludge feed characteristics (percent solids and percent volatile content) and with incinerator operating

conditions (i.e. variations or interruptions in sludge feed rate). The commenter (134.1) provided an analysis of 154 sets of SSI emission data (taken from the EPA Sewage Sludge Test Programs) showing the average NO_x emission from a MH incinerator was 283.6 ppmdv corrected to 7% O2 with a standard deviation of 165.2 ppmdv. The commenter (134.1) recommended a NO_x emission limit of 365 ppmdv corrected to 7% O2 for existing MH incinerators which is the average value from the analysis plus half of the standard deviation (283.6 + 165.2/2). Two commenters (102.1, 116.1, 134.1) stated that at relatively low solids concentration (20% to 24%) it is possible to consistently meet the proposed NO_x standard for FB incinerators. However, the commenters (102.1, 116.1, 134.1) noted that at higher solids concentrations (28% to 30% or higher) which are typically achieved with de-watering equipment, NO_x emissions would be significantly higher than the 63 ppmdv limit. The commenter (102.1, 116.1) noted that in order to conserve fuel, many WWTPs have upgraded their dewatering equipment to produce higher solids sludge. Another commenter (134.1) recommended a NO_x emission limit of 150 ppmdv corrected to 7% O2 for FB incinerators. The commenter (134.1) pointed out that this is about the lowest level which a fluidized bed supplier is willing to guarantee on a new FB incinerator.

The same commenter (134.1) contended that the proposed NO_x limits are not truly representative of actual long-term system performance because they were based on a limited data set. The commenter (134.1) stated that specific control devices or processes to control or reduce NO_x are virtually non-existent in SSI installations, despite the fact that some units have existing permit limits related to NO_x emissions. The commenter (134.1) stated that these historical limits have been based more on what has typically been observed for each subcategory of SSI unit than on any underlying theory or control mechanism; historical limits have often been expressed in terms of pounds emitted per pound of feed processed or in terms of concentration limits. The commenter (134.1) is concerned that the proposed limits for existing and new SSI units are overly restrictive (particularly the limits for new SSI units) and would require the use of add-on control technology that has not been proven in SSI applications. The commenter (134.1) urged EPA to consider that the proposed limits for CO emissions have an impact on the NO_x emissions as well; and stated that they believe that NO_x emissions are adequately managed under the PSD requirements.

<u>Response:</u> EPA's variability analysis, based on the emissions data collected, adequately characterizes the impact of potential differences in sludge contents on emissions of NO_x as well as other pollutants. The MACT floor limits in the final rule are described in the memorandum,

"Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" in the SSI docket (EPA-HQ-OAR-2009-0559). Based on the NO_x concentration data collected, EPA believes the majority of MH units will be able to meet the final NO_x emission limit of 220 ppmvd and that the majority of FB units will be able to meet the final NO_x emission limit of 150 ppmvd. For the units expected to need further NO_x control, EPA believes that selective non-catalytic reduction would be a feasible control option. We also note that NO_x emissions are not solely influenced by the solids content, but also the combustion characteristics of the incineration unit. The additional data cited by the commenters was only a summary that did not contain test information. Therefore, we were not able to evaluate whether he data was collected using appropriate test methods and quality control procedures. Additionally, variability can only be determined using the information from the best-performing 12 percent of existing sources, or the best single source. We requested additional test information in the NPRM, but did not receive any in the comments.

10.7 Comments on the HCI Standards

Comment: One commenter (129.1) stated that they did not know of any method to reduce hydrogen chloride emissions from sewage sludge incinerators, which are negligible.

Response: EPA maintains that packed bed scrubbers can reduce HCl emissions sufficiently to meet the emissions standards. Currently 6 SSI units use packed bed scrubbers. Comments have not provided any data that refutes our determination.

10.8 Comments on Mercury Limits

Comment: Several commenters (101.1, 126.1, 134.1) stated specific concerns with the data used to set the mercury emission limits for both types of SSIs. For example, commenters (101.1) state that only two incineration sites (4 fluidized bed incinerators) incorporate all of the activated carbon based mercury removal devices. Commenters (101.1, 126.1, 134.1) cited the average mercury concentration in sludge as 5.22 mg/kg. Three commenters (65.1, 101.1, 126.1) noted that the four FBIs which incorporated activated carbon based mercury removal devices only had a sludge feed inlet concentration of 0.6 mg/kg mercury, or roughly an order of magnitude less than the mercury levels present at an "average" facility. The commenters (101.1, 126.1) argue that the statistical methodology cannot accurately establish the MACT floor for all sources and that more information must be collected.

Response: After evaluating the revised emissions dataset (see the memorandum "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology"(EPA-HQ-OAR-2009-0559) for further details) EPA concluded that it would not be cost effective to go beyond-the-floor for mercury control. Therefore, the final mercury emission limits are 0.037 mg/dscm for FB units (as opposed to the proposed limit of 0.0033 mg/dscm) and 0.28 mg/dscm for MH units (as opposed to the proposed limit of 0.02 mg/dscm). Please see Section V, Part C of the preamble for EPA's response to specific concerns regarding the statistical methodology for determining the MACT floor and the memorandum, "Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" in the SSI docket (EPA-HQ-OAR-2009-0559).

11.0 BEYOND THE FLOOR ALTERNATIVES

11.1 BTF for Mercury

Comment: One commenter (76.1) argued that EPA must use the MACT floor limit for mercury until EPA completes a full human health risk assessment and environmental impact statement to justify decreasing the mercury limit to beyond-the-MACT-floor limit. The commenter (76.1) added the justification for beyond-the-MACT-floor limits for mercury is a net improvement in public health and the environment. The commenter stated that EPA did not even quantify the level of benefit to public health and the environment, and asserted that EPA simply stated that since Hg is a persistent bio-accumulative toxic (PBT) pollutant, the beyond-the-MACT-floor limit was justified. Another commenter (85.1) argued that EPA failed to identify any mercury benefits in the proposed mercury beyond-the-floor standard , but instead considered benefits from particulate matter reduction as a surrogate for the benefits of mercury reduction. The commenter (85.1) noted that EPA's failure to identify actual mercury benefits in the beyond the floor standard renders its analysis deficient in this respect.

Conversely, some commenters (79.1, 84.1, 119.1) supported EPA's decision to propose a beyond the floor limit for mercury. One commenter (84.1, 119.1) contended that mercury is extremely toxic and can cause tragic adverse health effects even in tiny quantities. Further because mercury is extremely persistent in the environment and bioaccumulative, mercury emissions result in long term contamination the environment, food sources, and wildlife and pose an on-going and increasing threat to human health. The commenter (84.1, 119.1) added that because EPA's floors for mercury are far less protective than § 129 requires (see above), they would allow many of the dirtiest SSI to avoid controlling their mercury emissions. The commenter stated that setting beyond the floor standards would ensure that these units will reduce their emissions. The commenter (84.1, 119.1) agreed with EPA that SSIs' emissions of mercury can be substantially reduced by a control technology that is both available and affordable, activated carbon injection. The commenter (79.1) added they strongly encourage EPA to retain these provisions in the final rule. One commenter (138) urged EPA not to rush these types of rules as they are significant, and they will change the disposal methods used by many utilities. The commenter (138) stated that it is essential that EPA take more time to

understand the implications of setting the mercury limits below or the MACT standards, alternatives, and the time that facilities have for compliance.

Response: We have revised the beyond-the-floor analysis to incorporate changes made to the baseline emissions, new facility specific data and inputs provided by commenters, and revised control options. Based on the results of the beyond the floor analysis we have selected the MACT floor level of control for the final rule. Our beyond-the-floor analyses for the final standards are discussed in the preamble to the final SSI rules and documented in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559).

11.2 Over/Understated Mercury Emissions/Costs

Comment: Several commenters urged EPA to reconsider the beyond the floor mercury limit because emissions were overstated (97.1, 127.1, 76.1, 73.1, 134.1, 75.1, 85.1, 90.1, 111.1, 118.1) and costs for mercury control were underestimated (76.1, 73.1, 75.1, 85.1, 90.1, 97.1, 127.1, 109.1, 126.1, 129.1, 132.1, 134.1, 136.1, 61.1). One commenter (109.1) stated that the EPA determination that mercury emission control for existing SSIs as cost effective is seriously flawed to "justify" the proposal to set the mercury emission limit for existing furnaces 88% below the MACT floor level; the commenter states that to do so arbitrarily poses a non-achievable mercury compliance limit for most facilities. Another commenter (49.1) argued that the total percentage of mercury being emitted from SSI's accounts for only about 1% to 2% of total atmospheric mercury that is from other global, natural and industrial Hg sources. One commenter (138) stated that the proposed mercury limits were "magnitudes below" the MACT standards, citing a flawed cost/benefit ratio.

One commenter (75.1) stated they would not be able to meet the proposed mercury standard, even with activated carbon injection. Commenters (109.1) stated that the extremely high cost-low emission reduction benefit imbalance of the proposed mercury limit needs to be fundamentally reconsidered by EPA. One commenter (97.1, 127.1) argued that EPA is compelled to explore alternative, less costly ways to decrease mercury emissions before imposing beyond the floor controls, stating that EPA's beyond the floor mercury limits are not justified by the record and should be removed from the final rule. The commenters (109.1) requested that EPA revise the proposed rule to have a more realistic and achievable mercury emission limit for existing sources.

Response: We have revised the beyond-the-floor analysis to incorporate changes made to the baseline emissions, new facility specific data and inputs provided by commenters, and revised control options. Based on the results of the beyond the floor analysis we have selected the MACT floor level of control for the final rule. Our beyond-the-floor analyses for the final standards are documented in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559).

We have reviewed the commenters concerns regarding Hg control technologies and agree that applying carbon injection to existing scrubbers has not been demonstrated to be effective at removing Hg. For other combustion sources, carbon injection in combination with a FF has proven to be highly effective in removing Hg. However, we also agree that for high moisture flue gas streams, such as emitted from SSI units, the use of FFs is problematic due to plugging/fouling. In order to use carbon injection with a FF with high moisture streams, a waste heat boiler, RTO, or afterburner is necessary to maintain a high enough temperature to keep the stream above the dew point prior to sending the stream to the FF. Additional equipment may also be necessary to reduce the temperature of the flue gas to prevent damage to the fabric filter bags. Please see Section V, Part E of the preamble for EPA's more detailed response to these comments. A detailed discussion of the costs and emissions reductions estimates for the final standards is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Comment: One commenter (134.1) asserted that EPA inappropriately used the HMIWI cost model and ignored several major cost factors, claiming that the costs for both MACT compliance and BTF MACT compliance are under-estimated. The commenter (134.1) stated that EPA failed to identify key differences between the processes of incinerating hospital waste and biosolids. The commenter (134.1) asserted that EPA did not realize that the two wastes (HMIW and Sewage Sludge - SS) and the methods used to control emissions from combustion of these wastes are fundamentally different. The commenter (134.1) stated that HMIW has a relatively low moisture content (approximately 10% to 20%), whereas sewage sludge (SS), as fed to a combustion unit, is 70% to 80% water. The commenter (134.1) asserted that this means that the flue gas from a SSI has a much higher water vapor content than that form an HMIWI, and concluded that the size, configuration, and air pollution control methods of an HMIWI are markedly different than that for an SSI. The commenter (134.1) stated that practically all SSIs

have some type of wet scrubbing system (or wet scrubber in combination with wet electrostatic precipitator) to control their emissions, and noted that there are only three SSIs in the US that use fabric filters for emission control, located at the same treatment plant.

Response: EPA is not prescribing a specific control technology or method. A source is required to meet the final emissions limits in these standards, and has the flexibility to use the control method or technology that is best suited for their individual facility. EPA's costs are estimated based on technologies we believe may be appropriate for the sources to meet the emissions limits. Cost algorithms are based on those used for HMIWI controls, but these were modified to incorporate parameters specific to the SSI units rather than HMIWI units. For the final standards we have also revised the types of controls costed to meet the MACT floor limits. For SSI's that we estimate will need further control of PM, Cd, or Pb to meet the MACT floor, we have costed out wet ESP as a more appropriate PM control for high moisture streams. We have also costed out SNCR for SSI's that we estimate will need further control of NOx to meet the MACT floor limits. As at proposal, we have costed out packed scrubbers for SSI's that we estimate will need further control of HCl or SO2. At the MACT floor level, we do not estimate that any SSI's will need to add control for Hg, PCDD/PCDF, or CO. A detailed discussion of the costs and emissions reductions estimates for the final standards is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

11.3 Alternative Mercury Control Options

Comment: Some commenters (80.1, 137.1) stated that EPA has not considered the technical, economic and environmental benefits of other technologies for mercury control in establishing the MACT floor. The commenters (80.1, 137.1) specifically requested that EPA consider allowing fixed-bed carbon adsorption over carbon injection, stating that carbon injection is not as effective as fixed-bed adsorption when elemental mercury makes up a significant portion of the mercury in the flue gas. One commenter (105.1) stated that carbon injection has not shown to be as effective as fixed-bed adsorption when elemental Hg makes up a significant portion of the Hg in the flue gas. Another commenter (67.1) recommended the use of fixed bed carbon canisters, stating that this technology has a longer operating history, is operator friendly, has low operation and maintenance costs, and can meet the proposed MACT standards when coupled with a WESP. One commenter (80.1) stated that a WESP with a packed bed

section and fixed bed carbon adsorption may be sufficient. One commenter (49.1) recommended that EPA perform a cost/benefit analysis for installing fabric filters on high efficiency ESP. One commenter (105.1) stated that there are numerous modern fluidized bed incinerators already equipped with high-efficiency wet scrubbers for PM and metals control, several of which are equipped with fixed bed carbon adsorption for Hg control. Several commenters (87.1, 115.1, 112.1) stated that a significant drawback of activated carbon injection is that the mercury-laden carbon and ash cannot be collected separately, thereby eliminating currently-implemented beneficial use options for the ash. At least one commenter (87.1, 112.1) suggested fixed bed carbon adsorption (i.e., Kombisorbon Process) be utilized to allow ash and carbon to be disposed of separately, preserving beneficial use options for the ash.

Response: EPA is not prescribing a specific control technology or method. A source is required to meet the final emissions limits in these standards, and has the flexibility to use the control method or technology that is best suited for their individual facility. EPA did not have sufficient cost information to fully evaluate fixed carbon adsorption or similar controls. We have revised the beyond-the-floor analysis to incorporate changes made to the baseline emissions, new facility specific data and inputs provided by commenters, and revised control options. Based on the results of the beyond the floor analysis we have selected the MACT floor level of control for the final rule. Our beyond-the-floor analyses for the final standards are documented in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559).

Comment: One commenter (49.1) provided an alternative means to reduce mercury emissions using a chemical precipitation process on the effluent water stream from the incinerator wet scrubber. The commenter (49.1) stated the process uses lime, polymer, flocculation, and filtering equipment to precipitate bound mercury in the scrubber effluent instead of recycling back to the plant influent. The commenter (49.1) added that the process could be more cost effective than carbon adsorption, and that less operation problems occur since the equipment is out of the incinerator flue gas system. The commenter (49.1) noted a major advantage of the use of chemical precipitation is that heavy metals and bound mercury can be concentrated into a slurry for landfill disposal or chemical treatment rather than being dispersed back into the environment.

Response: EPA thanks the commenter for their input. However, EPA did not have sufficient data on the cost and performance of the technology to fully evaluate it as a viable control option.

Comment: Two commenters (49.1) noted that replacing an outdated wet venturi scrubber with a new high efficiency electrostatic precipitator or Venturi-Pak scrubber will reduce the bound mercury emissions, but not the elemental (gaseous) mercury. Atlanta documented bound mercury emissions reduction using the Venturi-Pak in a WEF 2002 paper. One commenter (49.1) added that the capital cost to retro-fit an out-dated venturi scrubber is reasonable; to protect public health, as new scrubbers can remove about 90+% of the submicron particulates, heavy metals and bound mercury.

Response: EPA thanks the commenter for their input. However, EPA did not have sufficient data on the cost and performance of Venturi-Pak scrubbers for Hg control to fully evaluate it as a viable control option.

Comment: Two commenters (126.1, 101.1) supported using activated carbon polishing instead of activated carbon injection. The commenter (101.1) stated that, in addition to a PM control device, activated carbon injection requires instrumentation and controls to regulate the amount of carbon used to match the exhaust gas flow and mercury content. The commenter claimed that at their facility, activated carbon injection prior to the wet scrubber is unfeasible because the afterburner exhaust prior the scrubber is too hot (> 1500°F). The commenter stated that an activated carbon polish unit (an adsorber column or tower filled with treated granular or pelletized activated carbon) is preferred because it has no moving parts (exhaust is directed through a static bed of carbon) and does not require another PM control device. The commenter (126.1) noted benefits of no moving parts and no additional required PM control device for activated carbon polishing, unlike activated carbon injection, which requires controls and instrumentation to match flue gas flow and mercury concentration and additional PM control. The commenter (126.1) pointed out that mercury removal using iodine or sulfur-impregnated granulated activated carbon filters is proven technology; however, no carbon filter systems exist on MH incinerators. The commenter stated that mercury removal rates of greater than 98% have been documented by Kombisorbon®.

Response: EPA thanks the commenter for their input. We do not have information on the cost and performance of this technology for SSI units, and whether it has been demonstrated on SSI units.

Comment: A commenter (56.1) indicated the removal of mercury using carbon filters has been demonstrated on FB installations where inlet temperature and moisture to the carbon filter are controlled. The commenter stated that these systems elevate the flue gas temperature prior to the carbon filter to maintain temperatures above the dew point to control moisture to the filter. The commenter further stated that elevating the flue gas temperature to the carbon filter uses more fuel, and produces more NO_x and CO emissions. However, the commenter (56.1) added the exit flue gases from the post scrubber configuration, (either RTO or Recuperative Heat Exchanger / Separate Chamber Afterburner) are relatively low temperature, above the dew point, and relatively VOC free thus ideal for lower cost mercury removal in an add-on carbon filter following the RTO. The commenter stated that costs of a carbon filter after an RTO will be less expensive than carbon injection with baghouse; therefore, carbon use will be less and carbon / mercury disposal will be less.

Response: EPA is unaware of SSI units that use this technology and would need more information regarding the technology's performance and cost in order to fully evaluate it.

Comment: One commenter (134.1) stated that the most reasonable way to add mercury control to the existing MHs is to use a carbon adsorber downstream of the existing wet scrubbing systems. However, the commenter stated that upon economic analysis, the resulting costs are clearly excessive and not justifiable. The commenter stated that this is particularly true when one considers that EPA will be proposing this year new Effluent Guidelines for dental offices, which are expected to remove approximately half of the mercury entering WWTPs.

Response: EPA thanks the commenter for their input.

11.4 Opposition to ACI

Comment: Several commenters (80.1, 67.1, 105.1) argued against EPA's proposed beyond the floor control option of activated carbon injection ahead of a fabric filter for mercury and dioxin/furans control. Commenters (118.1, 90.1, 122, 123) contended that the proposed rule, as written, forces SSIs to install unproven mercury reduction technologies (58) that could result in the expenditure of millions of dollars in possibly a futile attempt to remove mercury and the failure of which would result in significant non-compliance with unachievable limits. Some commenters (67.1, 105.1) argued that carbon injection consumes significantly more carbon, generates more solid waste, has higher capital and maintenance costs, and has significantly higher operation costs than alternative fixed bed technologies. One commenter (48.1) expressed

concerned that the mercury control requirement of a fabric filter with activated carbon injection would preclude the use of a wet ESP, which are already in place.

Several commenters (56.1, 90.1, 118.1, 122, 123) noted that carbon injection mainly removes mercuric chloride, and the removal of elemental mercury is unproven. Commenters (85.1, 97.1, 127.1) added that adsorption will not be as effective as EPA predicted due to low mercury concentrations in the exhaust gas. Additionally, one commenter (85.1) pointed out that mercury concentration in SSI exhaust are variable and EPA's selection of an 88% reduction efficiency does not account for the variability. Two commenters (109.1, 134.1) noted the high moisture content of the exhaust gas will blind the activated carbon, blocking mercury adsorption.

Several technical issues were also pointed out by commenters. Several (85.1, 97.1, 127.1, 90.1, 118.1, 109.1, 122, 123, 129.1, 138) pointed out that flue gas exhaust temperatures from MH incinerators are much higher than FB units and argued that mercury adsorption is a function of temperature and it is questionable whether mercury would adsorb at higher MH temperatures. One commenter (138) noted that at the Saint Paul Metro WWTP, the only wastewater treatment plant in the United States that injects activated carbon into its incinerator exhaust gas system, the carbon is injected into a carbon contact chamber followed by a fabric filter, and the incinerator exhaust gases entering the contact chamber are around 450 degrees Fahrenheit. The commenter (138) argued that since multiple hearth incinerators have exhaust gas temperatures in the range of 1000 to 1600 degrees Fahrenheit and minimal residence time within the exhaust gas ductwork, mercury adsorption would be negligible. One commenter (96.1) stated that although the ERG memo assumes mercury removal can be achieved with the addition of an activated carbon injection system to the exhaust gas stream, there is a limited temperature range required (300 to 400 degrees F) for effective mercury removal, which means that the normal incinerator exhaust gas exit temperature must be cooled with a waste heat boiler and heat exchanger, or with a very tightly controlled quencher – prior to injection.

Other commenters (129.1) pointed out that current system configurations do not allow sufficient residence time for adsorption to occur. Issues with equipment degradation, such as corrosion and abrasion (85.1, 97.1, 127.1, 111.1, 121.1, 129.1), erosion of refractory lining (129.1), and other adverse impacts (90.1) were pointed out by several commenters. One commenter (129.1) added when using activated carbon injection, the potential for scouring or plugging of the scrubber exists. A number of commenters (76.1, 85.1, 90.1, 118.1, 122, 123) claimed that the assumption that existing PM control devices can also remove activated carbon is

not valid. Several commenters (85.1, 97.1, 127.1, 118.1, 121.1, 129.1, 58, 63.1) claimed equipment in addition to EPA's estimates will be required; commenters (49.1, 85.1, 79.1, 127.1, 109.1, 111.1, 134.1) also stated that adding space to install the equipment is limited if at all available. The additional equipment mentioned included fabric filters, which commenters (49.1) stated were not cost effective and had issues of "mudding" due to high moisture content exhaust streams (56.1, 90.1, 118.1, 122, 123). One commenter (145.1) stated that there is practically no experience with the use of fabric filters for SSIs. The commenter (145.1) asserted that there is no other solid waste other than sewage sludge that has moisture as high as 75%, stating that the moisture content of flue gases from SSIs are about 30% by weight and 50% by volume. The commenter (145.1) stated that although fabric filters may work well for other type of incinerators, SSIs present different set of problems. The commenter (145.1) asserted that, due to moisture, the dew point of the flue gas is relatively high and the gases are corrosive. Other commenters (48.1, 87.1) claimed that that the combination of the high sulfur content in sludge combined with the high moisture content in flue gas makes the application of a baghouse "fraught with problems" relating to dew point corrosion.

Another commenter (56.1) pointed out that high temperatures to reduce moisture under dew point uses fuel, contributes to NO_x and CO emissions, and higher temperature can prove harmful to the bags. One commenter (134.1) states that if the carbon is injected into the hot incinerator flue gas without an upstream waste heat boiler, the carbon will simply burn up. The commenter (134.1) added that if the flue gas from a SSI is cooled in a waste heat boiler prior to a fabric filter, then activated carbon injection (ACI) upstream of the fabric filter is an effective means of mercury control.

Some commenters (68.1, 115.1) provided that injection of activated carbon is not a technically viable option for their units. The commenters (68.1) cited several reasons for the lack of viability of activated carbon injection control, including that the current particulate control system is wet, the current air pollution control system is very close coupled, and the blowdown from the wet particulate collection system feeds back to the headworks of the wastewater treatment system. The commenters (68.1) provided that specialty granular activated carbon may be the only technically viable option for limitation of mercury and dioxin. Other commenters (87.1, 112.1) stated that for flue gases with elevated levels of sulfur trioxide (>10ppm), sulfur-resistant activated carbon will be required for effective removal of the mercury.

Commenters (129.1) contended that the technology does not exist to meet each of the proposed emission guidelines or new source performance standards on a continuous basis. Commenters (80.1, 67.1, 83.1, 105.1, 129.1, 137.1, 138) noted that the fabric filter with alkali reagent and carbon injection is only used on one operating SSI in the U.S. One commenter (129.1) stated that the plant immediately ran into problems with its new system upon start-up, since the exhaust gas temperature was too low and moist, and discovered that they needed to raise the temperature of the gas stream prior to entering the adsorber. Several commenters (97.1, 127.1, 110.1, 83.1, 129.1, 145.1) asserted that this facility has had corrosion problems associated with this technology, and that a second wastewater plant with an activated carbon polishing system has reportedly had similar problems. Commenters (129.1) stated that due to problems at St. Paul Metro WWTP, the carbon injection system (with a carbon contact chamber followed by a bag house) is not a proven air pollution control technology for sewage sludge incinerators.

Commenters (129.1) also noted that activated carbon adsorbers would require a substantial amount of space, including the total reconfiguration of and expansion of existing air pollution control trains, and the expansion of incineration facilities by 20-30 feet or more; one commenter (129.1) added that a carbon storage/conveyance system would be required. One commenter (145.1) remarked that the fabric filters are a large piece of equipment and expressed concern regarding space constraints; the commenter requested that the costs of reconfiguring the existing equipment, ACP train, and modifying or enlarging the building be included in the cost estimates. Other commenters (85.1) argued that EPA did not consider additional energy requirements for the proposed control technology to meet the limit. The commenter (85.1) indicated that increased energy use will occur through the addition of a carbon injection system and a fabric filter (bag house), as would be required under the beyond-the-floor standards associated with Option 2, yet the energy use shown for the “MACT Floor Only” option is identical to the energy use shown for the other two options. One commenter (145.1) also stated that the SSIs at the Metro plant are equipped with wet ESPs; the commenter requested that the cost of wet ESPs be included in the cost estimates for the installation of fabric filters.

Numerous commenters (65.1, 85.1, 97.1, 127.1, 126.1, 129.1) pointed out the fate of captured mercury, citing issues such as cycle up from scrubber water being re-introduced into plant influent. Three commenters (85.1, 121.1, 129.1) pointed out that spent activated carbon collected from fabric filters would be considered a hazardous waste, requiring disposal at a hazardous waste landfill; another commenter (121.1) added that replacing spent carbon on a

continual basis is expensive. One commenter (138) further argued that since plants recycle scrubber water, the spent carbon will end up in the sewage sludge, and that the buildup of mercury that could occur within the plant could result in a NPDES permit violation. Another commenter (81.1) stated that the application of activated carbon into the exhaust gas system without the installation of additional auxiliary systems would not prove effective; the commenter asserted that without auxiliary systems, the mercury containing activated carbon would enter into the wastewater collection system to be recycled in the sewage sludge process. The commenter (81.1) asserted that this recycling would result in an accumulation of mercury within the wastewater treatment system and subsequently could present a toxic effect on the biological processes utilized at the facility. Another commenter (110.1) also argued that wet scrubbers would merely transfer mercury release from one media (air) to another (water) with no net benefit.

In general commenters (85.1, 79.1, 127.1, 111.1, 121.1) claimed that activated carbon injection has not been proven successful, even on FB units, adding that the systems are complicated and expensive (49.1, 111.1), and vendors have no experience installing systems on MH units (85.1) since no MH units currently employ activated carbon injection (111.1, 97.1, 127.1). One commenter (138) stated that POTWs that utilize activated carbon injection will have to install carbon contact chambers in baghouses. The commenter (138) requested that EPA include these additional costs in the cost effective analysis for going beyond the MACT floor for mercury. Two commenters (56.1, 90.1) contended the proposed rule as written, forces SSIs to install unproven mercury reduction technologies that could result in the expenditure of millions of dollars in possibly a futile attempt to remove mercury and the failure of which would result in significant non-compliance with unachievable limits. The commenter (56.1) argued that EPA's suggestion to use carbon injection be deleted from any final version of the rule.

Commenters (137.1) stated that there are many more modern FBIs and MHIs equipped with high-efficiency wet scrubbers for PM and metals control and several equipped with fixed bed carbon adsorption for Hg control. The commenters (80.1, 67.1, 105.1, 137.1) stated that to base the standards on the performance achieved by only one unique installation serves only to exclude other technologies that have much more widespread use, have long operating history, and offer advantages in the wastewater treatment industry. Another commenter (56.1) argued that EPA's suggestion to use carbon injection be deleted from any final version of the rule.

Response: EPA is not prescribing a specific control technology or method. A source is required to meet the final emissions limits in these standards, and has the flexibility to use the control method or technology that is best suited for their individual facility. However, after re-evaluating beyond-the-floor control options for mercury, EPA agrees with commenters that, for SSIs, ACI alone is not an appropriate control option for mercury. After reconsidering beyond-the-floor control options and revising the beyond-the-floor emissions reductions and cost analyses based on data corrections or additional data received during the comment period, EPA is not going beyond-the-floor in setting the final mercury limits. Please see Section V, Part F of the preamble for further discussion regarding the beyond-the-floor options for mercury control. EPA does not expect that units will need to install additional mercury control to meet the final standards. Our beyond-the-floor analyses for the final standards are documented in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559).

We have reviewed the commenters concerns regarding Hg control technologies and agree that applying carbon injection to existing scrubbers has not been demonstrated to be effective at removing Hg. For other combustion sources, carbon injection in combination with a FF has proven to be highly effective in removing Hg. However, we also agree that for high moisture flue gas streams, such as emitted from SSI units, the use of FFs is problematic due to plugging/fouling. In order to use carbon injection with a FF with high moisture streams, a waste heat boiler, RTO, or afterburner is necessary to maintain a high enough temperature to keep the stream above the dew point prior to sending the stream to the FF. Additional equipment may also be necessary to reduce the temperature of the flue gas to prevent damage to the fabric filter bags. Please see Section V, Part E of the preamble for EPA's more detailed response to these comments. A detailed discussion of the costs and emissions reductions estimates for the final standards is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Comment: One commenter (134.1) argued that the proposed regulations should not force the use of fabric filters in lieu of a well designed wet scrubbing system. The commenter (134.1) stated that in general, the use of fabric filters in SSI units has been limited due to the high moisture content of the exhaust gases and potential operating problems with fabric filter collection systems. The commenter (134.1) purported that FB units have been designed with more comprehensive and effective PM control technologies than MH units. The commenter

(134.1) stated that this is expected as many of the FB systems are newer and have conventional venturi/impingement tray tower wet scrubbing systems, sometimes augmented with WESP systems.

Response: EPA is not prescribing a specific control technology or method. A source is required to meet the final emissions limits in these standards, and has the flexibility to use the control method or technology that is best suited for their individual facility. EPA's costs are estimated based on technologies we believe may be appropriate for the sources to meet the emissions limits. For the final rule we have re-evaluated control options for MACT floor compliance and determined that for SSIs, venturi scrubbers or wet electrostatic precipitators would be more appropriate than fabric filters for PM and metals control.

11.5 CO 100 ppmv Limit

Comment: Three commenters (76.1, 90.1, 97.1, 127.1, 129.1) supported EPA's decision not to go beyond the floor for CO. Four commenters (76.1, 90.1, 97.1, 127.1, 129.1) noted increase fuel usage, and NO_x emissions, and three commenters (90.1, 97.1, 127.1, 129.1) indicated additional greenhouse gas emissions, operational and maintenance costs, and capital costs do not warrant a beyond the floor limit for CO. One commenter (76.1) supported EPA's statement that an FB incinerator can meet the 100 ppm CO limit, but claimed that MH incinerators could not meet a 100 ppm CO limit. The commenter argued that USEPA Office of Water agreed with this conclusion, and revised 40CFR503 so that MHFs can meet a 100 ppm Total Hydrocarbons (THC) emission limit in lieu of a 100 ppm CO emission limit. The

Response: For the final rule, EPA is not going beyond the floor for CO emission limits. Section 129 of the CAA requires EPA to set limits for nine specific pollutants, and therefore EPA cannot use THC as a surrogate for CO. The CO limits in the final rule are based on EPA's revised UPL methodology, which is documented in the memorandum, "Revised MACT Floor Analysis for the Sewage Sludge Incinerator Source Category" in the SSI docket (EPA-HQ-OAR-2009-0559). The revised final CO emission limit for new FB units is 27 ppmvd and for new MH units is 52 ppmvd. The revised and final CO limit for existing FB units is 64 ppmvd and for existing MH units is 3,800 ppmvd. Please refer to the MACT floor UPL calculation and EG and NSPS emissions limits section of the preamble for a detailed description of how these limits were chosen. The final rule also allows 24-hour block averages for CO CEMS (which are required at new sources), which should also help alleviate the commenters' concerns.

EPA chose not to go beyond the floor due to increases in NO_x and CO, cost, and energy inputs. The analysis is documented in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" in the SSI docket (EPA-HQ-OAR-2009-0559). The UPL includes facilities that reported greater than 2200 ppm CO; these facilities complied with the OW 503 alternative THC limit and had high CO concentrations. The high CO values from these facilities resulted in a calculated UPL of 3,800 ppmvd for existing MH units. EPA is required to set limits for CO for units regulated under Section 129 of the Clean Air Act, and is not allowed to use surrogate compounds, such as THC. States have the option to set limits more stringent than the emission guidelines and can set lower CO limits.

11.6 CO Control

Comment: Two commenters (56.1, 64.1) supported the use of afterburners or a post-scrubber RTO (or recuperative) afterburner to decrease CO emissions from MH incinerators. One commenter (56.1) claimed the RTO or recuperative afterburner will not result in excessive NOx emissions, referring to guarantees provided by RTO venders. The commenter (56.1) added that the cost of the add-on is cost-effective and that life cycle costs are very reasonable when operating fuel decrease is considered. The commenter (56.1) provided two facility examples quoting emissions, equipment types, and costs. The commenter (56.1) noted that RTO systems often include a wet electrostatic precipitator that has the added benefits of reduction of; particulate matter, acid gas, and metals to greater levels than conventional scrubber/afterburners on MH incinerators and the process is ideally suited for add-on dry mercury removal. The commenter (56.1) stated afterburners on MH installation will remain for control of CO emissions to 100 ppmvd or less.

Other commenters (76.1) agreed with EPA that an afterburner or RTO can reduce CO, but at the cost of increasing NO_x, fossil fuel usage and greenhouse gas emissions. The commenters concluded that use of an afterburner or RTO to reduce CO will result in an unacceptable increase in NO_x emissions. The commenters (76.1) also stated that most SSIs can meet the MACT floor limit for CO and NO_x without additional modification. One commenter noted that there will be substantial costs to incorporate the afterburner into an existing sewage sludge incineration system and the existing air pollution control train will have to be modified.

Response: After revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has re-evaluated beyond-the-floor options for all pollutants and has decided to set the MACT floor limits as the standards. EPA determined that it was not appropriate to go beyond-the-floor to achieve greater reduction of the pollutants considering the cost and secondary impacts incurred. A full description of the beyond-the-floor analyses can be found in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units"(EPA-HQ-OAR-2009-0559). EPA maintains that it is incumbent upon the SSI facility to determine whether combustion conditions can be adjusted to meet standards for both CO and NO_x and, if not, install NO_X controls as necessary (e.g., SNCR systems, SCR systems, FGR, or low NO_X burners). Please see Section V, Part E of the preamble for EPA's more detailed response to these concerns. The beyond-the-floor analysis for CO was based on application of an afterburner. We did not include cost estimates for RTOs given space considerations and higher capital costs when compared to afterburner retrofits. The annualized cost for RTO's was estimated to be four to six times the annualized cost of an afterburner.

Comment: One commenter (49.1) supported the use of improved solids dewater equipment, such as high solids centrifuges, as a means to control CO and also reduce incinerator fuel use. The commenter (49.1) referred to the Water Environment Federation, Incineration Manual of Practice FD-19, 1992 quoting "the most significant factor affection the operating economics of sludge combustion is cake solids concentration of the feed furnace." The commenter (49.1) noted several examples of reduced fuel usage and cost savings related to improved solids dewatering equipment. The commenter (49.1) pointed out that achieving autogenous combustion may not result in less than 100 ppmv CO, but autogenous biosolids will: 1) Increase hearth 0 temperatures, 2) reduce the fuel use to dry biosolids and 3) any afterburner fuel use required to achieve 100 ppmv CO. A benefit cost analysis by the EPA of using standard, high solids centrifuges to reduce CO emissions incinerator fuel use (for drying and afterburners) is needed. The commenter (49.1) also added that EPA should evaluate if any minimum hearth zero temperature is required to protect the public health, on MH incinerators that would have new scrubbers to reduce submicron particulates and metals. The commenter (49.1) also stated that fuel savings achieved by FB incinerators are mainly due to changes in the dewatering systems.

Response: EPA thanks the commenter for their input. However, EPA lacks the cost and performance data needed to evaluate the suggestion.

11.7 BTF for Other Pollutants

Comment: One commenter (76.1) supported EPA's decision that adding fabric filters (FF) to reduce PM and Cd beyond-the-MACT-floor is not cost effective. The commenter (76.1) also agreed that adding packed bed scrubbers to reduce HCl and SO2 beyond-the-MACT-floor is not cost effective. The commenter (76.1) concurred with EPA that beyond-the-MACT-floor technology to reduce CO, NO_x, and CDD/CDF is also not cost effective, and EPA's determination that there will be no beyond-the-MACT-floor limits for HCI, SO_2, PM, Cd, CO, NO_x, and CDD/CDF.

Response: EPA agrees with the commenter and thanks them for their support.

Comment: Commenters (79.1, 84.1, 119.1) argued that EPA should have set additional beyond the floor limits for dioxins. The commenter (79.1) stated that since mercury controls will bring about additional dioxin reductions, then it seems those controls are achievable for dioxins too and EPA is therefore compelled to require them as MACT. One commenter (84.1, 119.1) added that EPA must ensure that its standards reduce each of the pollutants enumerated in § 129(a)(4), including dioxins, by the maximum degree achievable. The commenter stated that if a standard more stringent than the floor is achievable for any of these pollutants, EPA must set such a standard and that standard must reflect the maximum degree of reduction in emissions that is achievable; furthermore, EPA cannot dispute that dioxin standards more stringent than its floors are achievable both technically and economically. Specifically, the commenter stated that they can be achieved through the use of ACI which is already the basis for EPA's mercury standard. The commenter (84.1, 119.1) noted because EPA found that the cost of ACI was achievable for mercury alone, the incremental cost of using that same technology to reduce dioxin emissions is zero.

The commenter further stated that failure to set beyond-the-floor standards is not inconsequential; although many SSI will need to install ACI to meet the mercury standard, some SSI will not. The commenter noted that these SSI will continue to emit more dioxin emissions than would be allowed under a properly set beyond-the-floor dioxin limit. Furthermore, the commenter stated that requiring sources to meet a specific dioxin limit and report compliance or non-compliance with that limit in their Title V permits has far greater value in protecting public

health and the environment than merely setting standards that will lead some sources to install a control technology known to reduce dioxin emissions. The commenter specifically stated that this would ensure that the reductions will actually happen.

Response: After revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has re-evaluated beyond-the-floor options for all pollutants and has decided to set the MACT floor limits as the standards. EPA determined that it was not appropriate to go beyond-the-floor to achieve greater reduction of the pollutants considering the cost, secondary impacts incurred, and concerns regarding the performance of beyond-the-floor technologies evaluated for this source category. EPA has discussed the concerns regarding high moisture content streams from SSI's in previous responses. The same issues for Hg control apply to dioxin/furan control. For other combustion sources, carbon injection in combination with a FF has proven to be highly effective in removing dioxin. However, we also agree that for high moisture flue gas streams, such as emitted from SSI units, the use of FFs is problematic due to plugging/fouling. In order to use carbon injection with a FF with high moisture streams, a waste heat boiler, RTO, or afterburner is necessary to maintain a high enough temperature to keep the stream above the dew point prior to sending the stream to the FF. Additional equipment may also be necessary to reduce the temperature of the flue gas to prevent damage to the fabric filter bags. A full description of the beyond-the-floor analyses can be found in the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units"(EPA-HQ-OAR-2009-0559). Please see Section V, Part E of the preamble for EPA's more detailed response to these concerns.

Comment: Commenters (79.1, 84.1, 119.1) argued that EPA is obligated to consider beyond-the-floor options and should do more than perform "preliminary" costs analyses for cadmium, lead, particulate matter and other pollutants. One commenter (79.1) claimed that EPA noted it performed a "preliminary cost and emission reduction analysis" (page 63275) on beyond-the-floor options for cadmium, lead, particulate matter and other pollutants and decided not to further analyze fabric filter and packedbed options. Another commenter (84.1, 119.1) added EPA rejected beyond the floor limits for cadmium, lead and particulate matter because after conduction a preliminary analysis EPA determined that costs would be high and deemed the reductions achieved not cost-effective. The commenter (84.1, 119.1) adds the test for beyond-the-floor standards under § 129 is not whether EPA thinks the cost of a particular control

technology is "high," but whether cost renders the application of that technology unachievable. The commenter states that EPA does not even claim that cost renders the application of FF unachievable for SSI, far less provide record evidence to support such a contention. The commenter (84.1, 119.1) stated that EPA's failure to set beyond-the-floor standards for lead, cadmium and PM based on the application of FF is unlawful and arbitrary. The commenter (84.1, 119.1) further stated that the test for whether a degree reduction is required by § 129 is not whether the agency regards it as "cost-effective." Rather, the commenter asserts that the test is whether EPA's floors do or do not reflect the "maximum" achievable degree of reduction. The commenter argued that if EPA's standards do not reflect the maximum achievable degree of reduction – i.e., if standards that would yield a greater degree of reduction are achievable – EPA must set beyond-the-floor standards regardless of whether it views such standards as cost-effective. The commenter asserted that the § 129 directive that EPA consider "cost" in determining the maximum achievable degree of reduction does not authorize EPA to base its beyond-the-floor decisions on cost-effectiveness considerations. The commenter argues that cost and cost-effectiveness are different concepts, especially in the context of § 129's mandate that EPA's standards reflect the "maximum" achievable degree of reduction. Specifically, the commenter stated that § 129 allows EPA to consider whether a particular degree of reduction is "achievable" considering cost – i.e. whether the means for achieving that reduction are too expensive for the industry as a whole to achieve. The commenter argues that § 129 does not allow the agency to replace Congress' mandate for the maximum achievable degree of reduction with a far more subjective exhortation to set standards reflecting the degree of reduction that the agency deems "cost-effective." The commenter (84.1, 119.1) noted EPA's failure to propose beyond-the-floor standards for HCl and SO2 based on the application of packed-bed scrubbers is unlawful and arbitrary for the reasons given for cadmium, lead, and particulate matter.

Response: Please refer to the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559). EPA evaluated multiple controls but determined not to go beyond the floor, based on costs and secondary impacts. Additionally, there are significant concerns with beyond-the-floor technologies for this source category, such as the high moisture content of the flue gas.

12.0 PERFORMANCE TESTING AND MONITORING REQUIREMENTS

12.1 Operating Ranges

Comment: Several commenters (129.1, 62.1, 115.1) stated that one or all of the proposed operating ranges (15-minute data, 4-hr rolling average, limit established at 90% of average value) for minimum pressure drop across each wet scrubber, minimum scrubber liquor flow rate, minimum scrubber liquor pH, and minimum combustion temperature are too narrow and not achievable. Other commenters (101.1, 85.1) stated that the scrubber pressure drop is not achievable for facilities with fluctuating sludge feed. Two of these commenters (129.1, 62.1) stated that the ranges will contradict with the operating parameters in 40 CFR 60 Subpart O, 40 CFR 503, State permits, and other permits. One commenter (129.1) stated that Subpart O allows the pressure drop to be as much are 70% of the test results. One commenter (76.1) recommended that EPA use the highest value of the three 1-hour runs to set the operating limit, as is allowed in their existing Title V permit. Conversely, two commenters (101.1, 85.1) stated that the proposed ranges for scrubber liquor flow rate and the minimum combustion temperature are achievable.

Response: EPA has determined that the operating limits are more appropriately based on the maximum or minimum values rather than the average values recorded during the performance test runs. The final rule requires that operating limits be established on a site-specific basis as the minimum (or maximum, as appropriate) operating parameter value measured during the performance test. This approach has been incorporated into the final rule for all operating parameters and will result in achievable operating ranges that will ensure that the control devices used for compliance will be operated to achieve continuous compliance with the emissions limits.

Comment: One commenter (97.1, 127.1) is concerned that limiting the operating parameter range to the range established during a single performance test can force a facility to achieve emissions well below a limit, thus enforcing a more stringent limit. The commenter (97.1, 127.1) stated that if a stack test confirms that emissions are 50 percent of the emissions limit, the operating parameters derived from that test would be ensuring that emissions remain controlled to 50 percent of the emissions limit during future operations. The commenter (97.1, 127.1) said that the operating parameter range should reflect the full range of operating conditions that correlate with emissions up to the emissions limitation. The commenter (97.1, 127.1) stated that facilities should have the flexibility to determine the averaging period on a site-

specific basis, developing a continuous compliance plan based on the stack test data and all other available information regarding the correlation of operating parameters to control device performance. The commenter (97.1, 127.1) stated that this ensures that the operating parameters actually correlate to performance at the emission limit and not at the rate captured during the stack test.

Response: EPA has determined that the operating limits are more appropriately based on the maximum or minimum values rather than the average values recorded during the performance test runs. The final rule requires that operating limits be established on a site-specific basis as the minimum (or maximum, as appropriate) operating parameter value measured during a single 4-hour run during the performance test. The results do have to be during the most recent performance test. However, also EPA has revised the rule to waive the operating limits during source testing so that sources may adjust their operating limits to provide increased operating flexibility provided the emission limits are met. The intention behind reassessing operating limits with new performance testing is to ensure that the limits remain appropriate for the source. By allowing the source to conduct performance tests with less stringent operating levels than may have been initially determined, the source will be able to set the limits at levels appropriate for their operations while ensuring emission limits are met. This approach has been incorporated into the final rule for all operating parameters and will result in achievable operating ranges that will ensure that the control devices used for compliance will be operated to achieve continuous compliance with the emissions limits.

Comment: One commenter (129.1) stated that the Part 503 regulations (governing the design of all SSIs) require facilities to establish a site-specific maximum combustion zone temperature, which is used to minimize the metal emission. The commenter (129.1) recommended that EPA remove the minimum combustion temperature parameter because it is not needed.

Response: The rule requires continuous parameter monitoring of control devices used to meet the emission limits for Hg, Cd, and Pb, such that monitoring maximum temperature is not needed to ensure that sources are meeting these limits. Minimum combustion temperature is needed to establish that the SSI is achieving good combustion and meeting its CO limit on a continuous basis.

Comment: Several commenters (75.1, 56.1, 137.1, 126.1, 118.1, 85.1, 76.1, 67.1, 111.1, 62.1, 122, 123, 115.1, 97.1, 127.1, 101.1, 109.1, 96.1, 117.1, 129.1) argued that the operating

range for sludge moisture content (daily composite of 3 samples taken 6 hours apart, limit established at 10% above and below average level, 60.4870(k)) is not achievable because moisture content is too variable. Many of these commenters (56.1, 118.1, 122, 123) stated that sludge moisture is a parameter extremely sensitive to the type of dewatering equipment used by the operator, and also to seasonal variation in the treatment process of the WWTP; it is not uncommon for changes in sludge to occur monthly, weekly, and even daily. One commenter (101.1) stated that their customer sludge ranges from 15% to 26% solids and blended sludge during the most recent stack tests averaged 24.8% solids. The commenter (101.1) stated that in order to keep the blended sludge between 22.3% and 27.3% it would require dewatering most of their outside sludge in house which would require new receiving facilities. Another commenter (126.1) stated that they incinerate a variety of dewatered cake and liquid sludge from outside sources in addition to its own sludge produced at the River Road, Hopewell and Pennington WWTPs; during 2009 their incinerated sludge varied from 15.3 to 23.3 percent total solids. Another commenter (96.1) stated that their sludge cake varies in solids content from the low 20's to over 50% depending on the variability of the volatile solids content; and the weather plays a dramatic role in plant influent flow, with extended dry-weather flows under 100 mgd to wet-weather flows over 200 mgd. Another commenter (97.1, 127.1) said that during storms and other high flow events, the POTW is working hard to keep up with the influent and the sewage sludge feed rates and moisture content are necessarily on the higher end of the normal range; during low flow periods, SSIs may operate significantly below maximum feed rates with sewage sludge moisture at the low end of the normal range.

One commenter (74.1) questioned the purpose of requiring a minimum percent sludge moisture content, which could restrict the operator's ability to minimize use of auxiliary fuel. The commenter (74.1) said that they are unable to comply with the proposed sludge moisture content limits in §60.5190 and do not know what additional sludge treatment unit would need to be constructed to comply with the limits. The same commenter (74.1) said that their most recent performance test showed sludge moisture content varied from 38.4 to 47.8 percent, and older tests (2009) showed daily sludge moisture content ranged from 18 to 52 percent. The commenter (74.1) said that for their operation, only the wet weight is available to the operator on a real-time basis, but the dry weight must be determined in the laboratory by drying a sample for a specified time. The commenter (74.1) said the incinerator operator cannot control sludge moisture content,

but can maintain incinerator operation within design parameters by feeding auxiliary fuel as needed to maintain temperature and percent oxygen in an allowable range.

One commenter (56.1) said it is not feasible to obtain accurate sludge moisture results in a timely enough period in order to make any attempts at adjusting the controls of the de-watering equipment that would prevent deviations of 10% on any particular day. Another commenter (109.1) said that requirements for sludge moisture content would essentially mandate CEMS due to the frequency of occurrence of these variations in feed moisture concentrations and feed rates. Many of these commenters (76.1, 85.1, 75.1, 111.1) requested EPA to delete the sludge moisture range requirement since it serves no practical purpose. One commenter (76.1) recommended that the compliance averaging period for the sludge moisture parameter should be daily. Another commenter (56.1) recommended the restriction in deviation of 10% for sludge moisture should be revised to state a deviation of no more than 10 percentage points (in other words if a SSI is tested at 24% TS they should report deviations of 14% or 34% TS). Other commenters (137.1, 105.1) recommended using operating temperature in incinerator and the feed rate of mass of dry solids instead of the sludge moisture parameter.

Response: The final rule does not require that SSI units maintain sludge moisture content within specified ranges. EPA has determined that the operating limit for temperature of the combustion chamber (or afterburner temperature) is sufficient to ensure good combustion practice, and that moisture content is not needed to establish that SSI units are in compliance with their emission limits. If a SSI has a higher moisture content, the SSI will need to use more fuel to comply with their operating limit for temperature of the combustion chamber. We are retaining the requirement to keep daily records of moisture contents, as SSI units should already be keeping records of these parameters, and this information will be useful in establishing representative operating limitations for a SSI unit.

Comment: Several commenters (101.1, 129.1, 85.1, 118.1, 76.1, 62.1, 97.1, 127.1) pointed out that the proposed requirement for establishing the operating range (where the sludge feed rate is required to be 110% of the average feed rate during the performance test) would establish the facility's maximum feed rate at a value lower than the permitted max rate. One commenter (118.1(13)) stated that Pennsylvania requires that performance tests be conducted at 85% of maximum capacity. Some commenters (123, 122, 118.1) state that charging the incinerator at 75% to 90% of its rated capacity results in a much steadier state of control and a more efficient combustion of the sludge, and in reality a greater ease of operation by the

operators in charge of the equipment. Many commenters (101.1, 129.1, 85.1, 118.1, 76.1, 62.1, 96.1, 109.1, 115.1, 97.1, 127.1) argued that the feed rate will not stay in the proposed window of 10%, such that the maximum capacity will be exceeded, resulting in deviations. Two commenters (109.1, 96.1) stated that EPA fails to take into account the normal variation in feed conditions and feed rates that occur on a daily, seasonal and wet weather dependent basis at any POTW, much less one that processes significant flows from combined sewer areas like the City of Indianapolis. The commenter (96.1) recommended that the maximum dry sludge rate be removed from the proposed language and stated that emission limits can be maintained under all conditions; even when significant changes to the feed rate have occurred. One commenter (76.1) recommended that the maximum dry sludge rate be the rated capacity of the MHF, not a percentage of the feed rate during the compliance demonstration source test (the unused capacity in the MHF is needed for the future planned growth in their service area). Another commenter (137.1) suggested that a "reduced capacity" operation such that the maximum capacity and efficiency of the incinerator is documented and approved, but that the normal deviation of an operating parameter by more than 10% during the reduced capacity is not considered a "deviation" by the terms of the guidelines. One commenter (97.1, 127.1) suggested that the operating and maintenance parameters be established in site-specific operating plans that focus on the parameters that correlate with control device efficiency.

Response: EPA has reviewed its decision at proposal to require that SSI units maintain the sludge feed rate of the incinerated sludge within specified ranges. For the reasons stated by the commenter, we are no longer requiring that SSI units maintain the sludge feed rate within specified ranges. We have determined that the operating limit for temperature of the combustion chamber (or afterburner temperature) is sufficient to ensure good combustion practice. However, we have added a requirement that performance tests be conducted at 85 percent of the permitted maximum capacity. This level has been selected based on the performance test operating information provided by the commenters and previous EPA standards. Sludge feed rate information is necessary during performance test runs to establish that SSI units are in compliance with the new requirement that they conduct performance tests at 85 percent capacity. We are retaining the requirement to keep daily records of sludge feed rates, as SSI units should already be keeping records of these parameters, and this information will be useful in establishing representative operating limitations for a SSI unit.

12.2 Data Averaging Periods

Comment: Two commenters (134.1, 76.1) agreed with the use of a 4-hour rolling averaging time for monitoring of operating parameters. Two commenters (101.1, 126.1) recommended that the proposed 4-hour rolling average period for operating limits be increased to a 24-hr block average. The commenters (101.1, 126.1) stated that record keeping requirements and compliance demonstrations are simplified when averaging is performed on a block rather than rolling basis. Another commenter (76.1) requested 4-hour rolling averages for CEMS and 4-calendar day rolling average for daily limits. One commenter (85.1) recommended that EPA retain 24-hour block averages because 24-hour block averages are more accommodating of the significant variability in the sludge cake feed to SSIs. Additionally, the commenter (85.1) pointed out that 40 CFR 503 requirements for SSIs require 24-hour averages and stated that changing the averaging period to 12 hours under this rule would increase the administrative burden on SSI operators by requiring calculation and reporting in two different formats.

A few commenters (97.1, 127.1, 101.1, 126.1, 134.1, 129.1) responded to EPA's request for comment on the proposed averaging period for determining compliance using a CEMS or CASS. One commenter (134.1) agreed that the proposed use of a 24-hour block average for reporting CEMS data is appropriate. The commenters (97.1, 127.1, 101.1, 126.1, 129.1) indicated that the 24-hour averaging period was not long enough and should be increased to a 30-day (or longer) period. One commenter (97.1, 127.1) explained that waste water influent has significant and unpredictable variability due to unavoidable spikes in compound concentrations. The commenter (97.1, 127.1) specified that high concentrations of mercury can be released when segments of the sewer are periodically cleaned downstream of a dentist office where mercury-containing amalgams are discharged into the sewer, and during for other periodic activities and spills upstream. The commenter (97.1, 127.1) was concerned that these spikes are not reflected in EPA's database for setting the MACT floor. The commenter (97.1, 127.1) pointed out that POTWs do not have the option to refuse such discharges. Another commenter (129.1) recommended that compliance with the operating limits be set on a monthly-daily average basis, same as is required by the Part 503 Regulations. The commenter (129.1) recommended data collection, recordkeeping, and averaging requirements be similar to those contained within the Part 503 Regulations.

Several commenters (134.1, 80.1, 105.1, 137.1, 67.1) argued that the proposed CO standard would be difficult to consistently achieve with an FBI (unachievable with a MHI) on a

4-hr rolling average basis. The commenters (134.1, 80.1, 105.1, 137.1, 67.1) stated that a 24-hr basis may be more realistic. Some of these commenters (80.1, 105.1, 137.1) said it may still require increasing residence time in the freeboard to achieve 7.4 ppm. Commenters (76.1) urged EPA to clarify what averaging time would apply to any given parameter.

Response: The EPA has determined that a 24-hour block averaging period for compliance with the CO CEMS requirement for new sources will provide a sufficient indication of compliance and will allow more flexibility for facilities. For other parameter limits, we have adopted a 12-hour block average. This averaging period is generally consistent with the longest anticipated source testing periods under this rule, and thus is appropriate for determining continuous compliance. With respect to mercury spikes, we expect that mercury spikes to dental amalgams will be less frequent due to the Office of Water's dental amalgam rule will be proposed in 2011 or 2012 and local programs to control these discharges.

Comment: One commenter (76.1) argued that the use of a 24 hour block of data to demonstrate initial compliance is excessive and adds substantially to the source test cost. The commenter (76.1) stated that California Air Resources Board and the Bay Area Air Quality Management Board use the average value of three, one (1)-hour sampling runs to show compliance; a 3-hour source test costs approximately $3,000. The commenter (76.1) stated that a 24-hour source test will cost more than $24,000; and recommended that EPA require the average of three 1-hour runs. One commenter (76.1) requested EPA provide justification for increased monitoring costs because the costs per CEM are significant.

Response: EPA would like to clarify that CEMS are not required by the final rule except to demonstrate continuous compliance with the CO limit for new sources. CEMS are optional for all existing sources.

Comment: One commenter (134.1) stated that daily composites of three samples taken six hours apart is acceptable for units operating on a continuous basis; however, for units that may only operate on an intermittent basis, the timing of the three daily samples should be spread roughly equally throughout the operating period, which may require sampling more frequently than 6-hour intervals.

Response: We are no longer requiring that SSI units maintain sludge moisture content, but are still requiring records of sludge feed rate.

Comment: One commenter (76.1) recommended that compliance with the maximum MHF feed rate cannot be a 4 clock-hour average, but should a 10-day rolling average. The

commenter (76.1) stated that this gives enough operational flexibility to deal with diurnal influent flow variation as well seasonal influent flow variations.

Response: We are no longer requiring that SSI units maintain sludge feed rate within specified ranges, and feed rate monitoring has been removed from the final rule.

Comment: One commenter (76.1) requested that EPA base compliance on a clock-hour average and not on an instantaneous value from the opacity CEMS. The commenter (76.1) argued that Opacity is measured by an observer recording opacity to the nearest 5% at 15 second intervals; since most of the data was collected when the incinerators were running well, the measured opacity was low and EPA's statistical method produced an opacity limit of 10%. The commenter (76.1) stated that it has a very low opacity on average but the Title V operating permit limit is 20% opacity for greater than 3 minutes out of every hour.

Response: We agree that a no visible emissions (zero opacity) limit for combustion processes is impractical for both compliance and enforcement purposes. We also believe that a measurable opacity may or may not be indicative of compliance with a PM emissions limit when applied to multiple sources within the category. That is, an opacity limit applied to one facility could very readily correspond to a PM emissions level different than that same opacity limit applied to another facility and one or both may be emitting above the PM limit. That opacity limits do not apply very well when wet control devices are used further confounds the benefit of such regulatory limits. We also agree that there are both CEMS and site-specific parametric monitoring approaches applicable to various control devices that can be more closely aligned with PM control and compliance with the PM emissions limit than would an opacity limit and opacity monitoring. Instead of establishing opacity limits that may or may not assure compliance with PM emissions limits, the final rules include rigorous requirements for establishing site-specific operating limits derived from the results of performance testing. The rules also include a requirement that sources update those enforceable operating limits with each repeated performance test. Re-establishing operating limits periodically will assure that the monitoring will continue to indicate compliance with the PM emissions limits. The rules also provide the source the option of apply CEMS to monitor directly the pollutant of interest in lieu of parametric monitoring. We believe that continuous compliance with operating limits and periodic stack testing to verify the operating limits plus the CEMS option will ensure that sources demonstrate continuous compliance with the PM emission limits more effectively than would periodic or continuous monitoring of a broadly applicable opacity limit.

12.3 Testing Frequency

Comment: Many commenters (129.1, 90.1, 95.1, 109.1, 134.1, 85.1, 97.1, 127.1, 62.1) disagree with the need for annual compliance testing. Several of these commenters (129.1, 90.1, 95.1, 109.1, 134.1, 85.1, 97.1, 127.1, 138) recommended that EPA require testing once every five (5) years, matching the Title V requirements. Some commenters (129.1, 85.1) argued that POTWs that have multiple incinerators (especially identical), may choose not to operate one or more of their incinerators during a calendar year, and it will be very costly to place a non-operating incinerator into service simply for an air emissions test. One commenter (129.1) stated that the proposed frequency is based on hazardous and medical waste incinerator rules, and argued that sewage sludge is not a hazardous material, nor a hospital, medical or infectious waste. One commenter (97.1, 127.1) argued that POTWs are already subject to comprehensive management practices, strict health-based sludge content limits, and NESHAPs under CWA § 405 and the Part 503 regulations, such that annual stack testing is not necessary to ensure compliance with emission limits or reduce health risks. The commenter (97.1, 127.1) stated that EPA requires performance testing less frequently than annually in several MACT rules, e.g., NESHAP for Coke Ovens: Pushing, Quenching, and Battery Stacks, 40 CFR. § 63.7321 (testing twice per permit term); NESHAP for Lime Manufacturing Plants, 40 CFR. § 63.7111 (testing every 5 years); NESHAP for Iron and Steel Foundries, 40 CFR. § 63.7731(a) (testing every 5 years).

Another commenter (95.1) is concerned that if EPA chooses to retain the annual performance testing requirements, requirements to re-test or for an annual inspection every 10-12 months essentially shortens the year by a month every year. The commenter (95.1) suggested that, at a minimum, EPA modify the regulatory language in §60.4895(a) and § 60.5215 to allow annual testing and inspections to be 11-13 months. One commenter (121.1) is concerned that the proposed frequency of testing required will be cost prohibitive. The commenter (121.1) stated that compliance grade stack testing costs tens of thousands of dollars per emission point each time testing is necessary to meet the proposed standards requirements. Another commenter (97.1, 127.1) is concerned that the cost for emissions testing may be significantly higher than $61,000 per unit that EPA predicted.

The same commenter (97.1, 127.1) supported less frequent emission testing when test results demonstrate that a source's emissions are less than 75 percent of the applicable emissions limits. However, the commenter (97.1, 127.1) stated that as explained in Part VII.A, supra, the

initial testing frequency should not exceed one test per permit term. The commenter (97.1, 127.1) suggested that any final rule should provide for less frequent testing when the results are sufficiently below the emission limit.

Response: The proposed standards included provisions for less frequent testing. Please see Section V.H of the preamble for more detail.

Comment: EPA states that the proposed rule would allow for reduced testing of PM, cadmium, lead, mercury, sulfur dioxide, hydrochloric acid, nitrogen oxides, and carbon monoxides at better performing facilities to only once every three years. One commenter (54.1, 60.1) disagreed with this proposed approach. The commenter (54.1, 60.1) stated that stack HAP concentrations shift continuously, particularly as a result of SSM-type events, so measurements every three years, or even annually, are not sufficient to gauge the true impact of these facilities' emissions on local and national air pollutant loads. The commenter (54.1, 60.1) argued that research shows that many of the ambient air pollutants influence acute cardiac and pulmonary function and excess short-term mortality (Chen and Lippmann, 2009); therefore, requiring monitoring only every 3 years does not provide either an adequate assessment of short-term emissions or acceptable protection of human health.

Response: The proposed standards included revised provisions for testing. Please see Section V.H of the preamble for more detail.

Comment: One commenter (97.1, 127.1) supported allowing initial compliance demonstrations to be based on earlier performance tests conducted prior to the rule if they represent current operating conditions and used the appropriate test method. The commenter (97.1, 127.1) suggested EPA not impose an arbitrary two-year cut-off period for the initial performance test; any test that meets the above criteria should be accepted, including all emissions testing conducted for the ICR.

Response: EPA has elected not to provide for this use of prior test results. Given the expectation that there will be recurring testing under this rule, the allowance for prior test results seems unnecessary as a general allowance. A source may seek a waiver of testing under the general provisions of Part 60 and should also review EPA's "Clean Air Act National Stack Testing Guidance" (dated April 27, 2009), which contains additional discussion on stack test waivers.

Comment: One commenter (92.1, 104.1) suggested that EPA replace the term "within" with "less than" in 60.5205(a)(3)(iii). The commenter (92.1, 104.1) stated that under

60.5205(a)(3)(ii), SSI units that demonstrate compliance at less than 75% of the limit or standard may be allowed to reduce the frequency of performance testing to once each third year or 36 months; and under 60.5205(a)(3)(iii), any SSI unit where the most recent performance test exceeds 75% of the emission limit for any pollutant must conduct annual performance tests for that pollutant until all performance tests over the next three years for that pollutant are "within" 75% of the applicable emission limit. The commenter (92.1, 104.1) stated that the intent is to perform testing for the pollutant of interest annually until the SSI unit has emissions "less than" 75% of the emission limit or standard.

Response: The language of 60.5205(a) has been updated to reflect the revised provisions for testing. Please see Section V.H of the preamble for more detail.

12.4 Definition of "Process Change"

Comment: Numerous commenters (74.1, 96.1, 134.1, 112.1, 87.1, 129.1, 118.1, 122) argued that EPA should remove the language that defines a process change as "an increase in allowable wastewater received from an industrial source to the wastewater treatment facility". One commenter (101.1) stated that the magnitude of what constitutes a change needs to be defined. Some commenters (101.1, 118.1, 134.1) are concerned that the proposed language requiring a repeat of a performance test is vague and open to misinterpretation from state and local authorities. The commenters (101.1, 118.1, 134.1) stated that EPA needs to provide more definition, and/or clarification and examples. One commenter (121.1) asked whether it was EPA's intention that the Proposed Standards will require a new performance test each time that flow from an industrial discharger to an SSI changes. Some commenters (74.1, 96.1, 134.1, 112.1, 87.1) argued that the proposed requirement to retest and update the SSI monitoring plan whenever allowable wastewater discharges from industrial users are increased would create redundant regulation to the National Pretreatment Regulations at 40 CFR 403, which are incorporated into the National Pollutant Discharge Elimination System (NPDES) permit issued to their wastewater treatment facilities. The commenters (74.1, 96.1, 134.1, 112.1, 87.1) stated that National Pretreatment Regulations require them to establish local limits on industrial discharges to prevent interference with sludge processes, use or disposal; therefore, they would not allow increases in industrial wastewater discharges to the wastewater treatment facility that would cause a violation of rules governing the SSI. Two of these commenters (112.1, 87.1) argued that given that industrial users are required to comply with local limits and that local

limits are periodically updated to ensure that the POTWs meet all applicable limits, including air emission limits that apply to incinerators, it is unnecessary to require retesting of SSI emissions or modification of the air monitoring plan due to increased permitted discharges from a particular industrial user. One commenter (74.1) argued that requiring performance tests to be repeated because of an increase in the allowable wastewater received from an industrial source would be very burdensome. The commenters (74.1, 129.1) stated that industrial wastewater that discharges to their wastewater treatment facilities only constitute a small percent (<8%) of total influent flow. The commenter (74.1) stated that these industrial sources (for example, a food processing facility) do not discharge the pollutants that would be regulated under the proposed SSI rule; therefore, an increase in the allowable industrial wastewater from these sources would not affect SSI air emissions. One commenter (118.1) said that the existing 503 regulations regarding the limits on concentrations of pollutants in the sludge feed to the SSI are sufficient to encompass any changes in the POTW's industrial waste. Other commenters (118.1, 122) argued that most industrial sources do not change their process quickly, and the requirement for annual performance testing would already account for changes; and some industrial sources can make small changes on a seasonal basis (many of these changes are temporary, such as a food processor increasing its production of apple juice in the autumn). One commenter (62.1) stated they would not be able to consistently comply with a new performance test if flow from an industrial discharger changes because there is no way to anticipate industrial loads ahead of time. Another commenter (121.1) is concerned about the frequency and costs associated with the performance tests that would be necessary anytime a significant industrial user increases the amount discharged to the sanitary sewer system.

Other commenters (105.1, 137.1, 109.1) argued that the proposed requirement to repeat a performance test if there is a “change to the process employed at the wastewater treatment facility that affects the SSI unit”, or “an increase in the allowable wastewater received from an industrial source to the wastewater treatment facility" is unreasonable for merchant facilities which accept sludge from regional wastewater treatment plants or POTWs which also accept outside sludge to facilitate operating their SSI closer to its design capacity (to achieve greater efficiency and lower operating costs). The commenters (105.1, 137.1) stated that the critical item with regard to changes to the system is whether the amount or quality of the sludge being burned is substantially different, not whether the process from which the biosludge is generated or the source of the wastewater treated has a larger flow or load. The commenters (105.1, 137.1) said

that wastewater treatment plants and associated SSIs are generally designed with additional capacity and POTW's with SSI have plans for other sludge disposal options for situations when their systems are down or otherwise unable to handle the sludge. The commenters (105.1, 137.1) argued that as long as the SSI is within its system capacity for sludge dry mass and the sludge is typical for wastewater treatment plant, additional stack testing is unwarranted.

Response: EPA has reviewed the definition of "process change" and agrees with the commenters that there are some situations where an increase in the allowable wastewater received from an industrial source should not trigger a performance test. We have revised the definition of "process change" to more specifically and clearly identify the type of process change that will trigger a performance test. The revised definition identifies a "process change" as pollutant-specific and as including only situations where the SSI has undergone a significant permit revision. This revision will ensure that facilities retest whenever they have a significant change in the process that could trigger higher emissions of a given pollutant.

Comment: One commenter (51.1) stated that the proposal did not require a repeat performance test at a SSI unit that decides to process other solid wastes. The commenter (51.1) recommended that EPA include a requirement for repeat performance testing in those instances where significant material changes (which should be defined) in the waste feed to a SSI unit have occurred.

Response: See the updated definition of "process change". The revised definition identifies a "process change" as pollutant-specific and as including situations where the SSI has undergone a significant permit revision. If there is a significant change to their NPDES permit, they must retest.

12.5 Waste Management Plan

Comment: Several commenters (96.1, 97.1, 127.1) supports EPA's conclusion that requiring waste management plans under §129 would be duplicative of the waste management practices already in place under the CWA. Another commenter (134.1) argued that that the intent of the Waste Management Plan used in previous §129 standards is not relevant to SSI units and should not be required. Other commenters (96.1, 129.1, 137.1) stated that they do not see the need for a waste management plan for SSI units. The commenters (134.1) stated that these plans relate more to solid waste incineration systems, where the feed can actually be separated prior to processing than to a POTW, where all incoming materials are co-mingled on a molecular level.

The commenter (134.1) stated that there are many jurisdictions that have implemented pretreatment ordinances or plans and some with active source control programs to reduce the discharge of various metals to the POTW, most notably Hg source control programs; these programs have been extremely effective in gradually reducing the levels of metals in the SSI feed stream over the past decades. Two commenters (96.1, 137.1) asserted that SSI units are required to meet EPA's OW part 503 standards for daily average concentration limits for Pb, Cd and other metals and that POTWs are required to establish pre-treatment standards and discharge limits for non-domestic users. The commenters (96.1, 137.1) are of the opinion that, given the Part 503 pre-treatment standards, the requirement for a waste management plan is unnecessary and would cause redundant reports and paperwork.

Response: EPA thanks the commenters for their input; the final rule does not require a waste management plan. We have determined that operator training is sufficient.

12.6 Annual Visible Emissions Test

Comment: Two commenters (105.1, 137.1) recommended that if there is a wet ash removal system as part of the incinerator system, it should be exempt from the annual visual testing of ash handling procedures. The commenters (105.1, 137.1) argued that if an incinerator system is using a wet ash removal system, an annual visual emissions testing provides no operational value and adds unnecessarily to the reporting burden of the facility.

Response: The general provisions provide for waivers of stack testing under certain conditions and EPA's national guidance on stack testing provides further information on stack testing waivers. EPA does not believe this situation as described warrants a complete removal of such systems from the testing requirements. Given the expected low readings from this test, this type of operation may well qualify for reduced testing based on one test (see section V.H. of the preamble for more detail).

Comment: One commenter (134.1) stated that annual visual testing of ash handling is burdensome and recommended that EPA change the testing frequency to every 5 years.

Response: EPA has revised the testing requirements in the final rule (see section V.H of the preamble for more detail). In the final standards, owners or operators are required to establish that emissions of a given pollutant are under a specified threshold for two consecutive years, rather than three years as proposed, to qualify for less frequent testing for that pollutant. For fugitive emissions from ash handling, less frequent testing is allowed as long as visible emissions

of combustion ash occur less than or equal to two percent of each Method 22 hourly observation period (the standard is five percent of each of three hourly observation periods).

Comment: One commenter (76.1) argued that Method 22 is not appropriate for determining opacity for ash truck loading operation because the sky is usually obstructed either by equipment or the truck itself. The commenter (76.1) stated that they have alarm devices on ash handling baghouses to indicate bag failure (and their bag houses are either inside a building or do not have an unobstructed view of the sky), so Method 22 is not practical. The commenter (76.1) recommended EPA change the wording that Method 22 visible emission test will be used when there is a clear emission point with an unobstructed view of the sky. The commenter (76.1) stated that if the ambient conditions are not suitable to use Method 22, best professional judgment must be used to determine if the ash loading operation is creating a nuisance.

Response: The general provisions provide for waivers of stack testing under certain conditions and EPA's national guidance on stack testing provides further information on stack testing waivers. EPA does not believe this situation as described warrants a complete removal of such systems from the testing requirements. Given the expected low readings from this test, this type of operation may well qualify for reduced testing based on one test (see section V.H. of the preamble for more detail).

Comment: One commenter (49.1) argued that control of fugitive ash emissions is essential; and stated that the EPA regulations need to differentiate between ash handling and flue gas systems that operate under 'negative pressure' and 'positive pressure'. The commenter (49.1) stated that an ash leak, when the system is under pressure will result in a very visible plume of ash discharge to the atmosphere. The commenter (49.1) urged EPA to model and measure how much ash is discharged to the atmosphere, with an ash system or flue gas system is under pressure and leaking into the air. The commenter (49.1) stated that the ash piping for a positive pressure system needs to be visually checked more frequently than once a year; and recommended at least once per shift (8 hours). The commenter (49.1) also recommended EPA consider requiring a system shut down immediately, if a bad ash leak occurs. The commenter (49.1) cited the WEF 'Wastewater Solids Incineration Systems' Manual of Practice, 2009, page 184 concerning ash pressure systems where it states "Even small leaks can result in substantial amounts of dust." The commenter (49.1) is concerned that after a community spends millions of dollars on new state-of-art electrostatic precipitators, bag filters, incinerators etc., a few small pipe leaks let the particulates back into the atmosphere.

The commenter (49.1) stated that when a system is under negative pressure, an ash leak may or may not result in any visible discharge. The commenter (49.1) stated that they worked in a MH facility for 8 years, where the MH incinerator, off-gas system and ash handling pipes were under negative pressure; during the monthly shutdown, the ash pipes had to be checked by listening for air leaks because ash would not always fall through the leaking pipe. The commenter (49.1) suggested that the major ash problem on a MH system is ash hopper plug-ups, at the bottom of the incinerator.

The commenter (49.1) recommended that for any new FB incinerator, the EPA needs to require that a cyclone be installed immediately after the FB incinerator because the cyclone should remove about 75% to 85% of particulates prior to any heat exchanger, to prevent unneeded abrasive wear on heat exchanges and the off-gas system. The commenter (49.1) stated that there is no need to have tons of abrasive ash discharge through expensive heat exchangers and create holes in a positive pressure system; thus resulting in ash leakage into the building. The commenter (49.1) cited the Water Pollution Control Federation Incinerator Manual of Practice, OM-11, 1976 page 189: "...fluidized bed furnaces may benefit from the installation of a cyclone at the exhaust to catch the large amount of ash (nearly 100% of the normal sludge ash content) and that portion of the bed that is continually exhausted. Cyclones are relatively inexpensive and removal of particulate matter prior to further treatment in other processes will reduce the loading to these control devices."

Response We agree that ash handling system integrity is an important component of the dust control measures necessary for compliance with the rule. The installation and implementation of equipment and procedures for maintaining and protecting process equipment an important to this end but site-specific designs and operating criteria or adherence to industry standards are not elements that the rule can or should address. These are practices that the source owner should take into account in designing and constructing or remodeling the facility to meet the applicable requirements. What the rule should and does require is that the source owner verify that the measures necessary to limit the amount of fugitive dust exiting the transfer points and exhausts from the building are such that they meet the visible emissions standard. The visible emission limit does apply at all times even though the requirement for compliance tesitng applies annually (unless the source qualifies for less frequent testing option – see other comments). The revised rule also requires that the source provide a monitoring plan that should

include frequent equipment inspections and even visible emissions checks to assure ongoing compliance.

12.7 Daily CPMS Pressure Tap Checks

Comment: Several commenters (118.1, 97.1, 127.1, 122, 123) argued that daily CPMS pressure tap checks are unrealistic, and in some cases, could cause the automatic safety shut down of the incinerator. The commenters (118.1, 97.1, 127.1, 122, 123) stated that much of the equipment associated with monitoring operational parameters have associated safety protocol limits and values programmed into the system's operating control philosophy. The commenters (118.1, 97.1, 127.1, 122, 123) are concerned that disconnecting the equipment from the tap may result in the equipment sensing an operational or mechanical failure, and can shut the system down for correction. The commenters (118.1, 97.1, 127.1, 122, 123) stated that to do this every day while burning sludge would be problematic, potentially resulting in reportable malfunctions and/or bypasses. The commenters (118.1, 97.1, 127.1, 122, 123) stated that their experience has indicated that these taps do not clog regularly and do not require daily disassembly. The commenters (118.1, 97.1, 127.1, 122, 123) recommended to do these checks on a monthly basis when calibrations are performed. Another commenter (76.1) requested EPA delete the daily pressure tap check requirement because that they use a control system that checks pressure measurements every second; and if the measurement goes out of normal operating range an alarm rings and the operator responds appropriately.

Response: EPA is no longer requiring daily pressure checks. Instead, you must ensure continuous acceptable operation of the pressure monitoring device (e.g., check for or provide high reverse gas pressure periodically to minimize pressure tap pluggage). EPA desires to avoid situations where facilities cannot meet a limit due to the control device failing because of the pressure reading.

12.8 Cleaning and Calibrating

Comment: Three commenters (76.1, 122, 95.1) stated that it is unreasonable for EPA to require pH meters to be calibrated on at least two points every 8 hours of process operation. The commenter (76.1) requested EPA revise the pH probe process to monthly calibration checks. The commenter (122) requested EPA require only daily calibration of a pH meter. Another commenter (95.1) argued that the length of time between checking the calibration of a pH meter

is site-specific and the unit should have flexibility to determine a frequency of calibration based on the historical experience without EPA prescribing a one-size-fits-all frequency. The commenter (95.1) stated that a set frequency for all instruments regardless of the sophistication of the instrument and regardless of the service environment for the instrument is not appropriate. The commenter (95.1) asserted that companies that have gone to the expense of using sophisticated instruments such as smart transmitters and other instruments with self-diagnostics as opposed to continuing to use older, less sophisticated systems would not benefit from upgrading their systems. The commenter (95.1) also argued that it is improper to propose continuous monitoring system requirements in the SSI proposal (§60.4509 of Subpart LLLL and §60.5225 of Subpart MMMM) while continuing to work on a new CPMS proposal; the commenter stated that EPA withdrew this rule (which was proposed on October 9, 2008 - Performance Specification and Quality Assurance Requirements for Continuous Parameter Monitoring Systems and Amendments to Standards of Performance for New Stationary Sources; National Emission Standards for Hazardous Air Pollutants; and National Emission Standards for Hazardous Air Pollutants for Source Categories or the "CPMS Rule"). The commenter (95.1) requested that EPA remove the prescriptive requirements related to continuous monitoring systems.

Response: EPA has revised the rule to require daily calibration. We have determined that daily calibration should be adequate to assure compliance, although some facilities may want to calibrate more frequently. The frequency of calibration is determined by the actual pH. Facilities may request an alternative monitoring frequency under the Part 60 general provisions (and under this rule) if they want to calibrate less frequently.

Comment: Two commenters (134.1, 76.1) requested EPA revise the proposed rule to allow the use of solid state calibrators or manometers for annual pressure gauge and transducer calibration checks.

Response: EPA does not require the use of a specific instrument used to perform gauge and transducer calibration checks in the final rule, provided that quarterly and transducer calibration checks are performed monthly.

Comment: One commenter (76.1) requested that EPA revise their accuracy requirements to the standard of full scale reading. The commenter (76.1) stated that temperature sensors are not rated on the value, but on the full scale; for example, a thermocouple could be accurate to ± 1% of full scale of 2000°F or ± 20°F for any reading.

Response: EPA disagrees. The standard is adequate as written. Sources can get a precise temperature measurement and ensure the thermocouple is within 1% of the temperature during the performance test.

Comment: One commenter (76.1) requested that EPA revise the requirement to calibrate temperature devices every 3 months to annual calibration or per manufacturer's recommendation.

Response: EPA disagrees. This is a simple measurement, especially if there redundant devices (EPA expects this for some SSIs). If they want to request an alternative compliance schedule, they can request this under the General Provisions 60.13.

12.9 Alternative Initial Accuracy Determination Procedure

Comment: One commenter (54.1, 60.1) provided comments on the alternate initial accuracy determination procedure similar to one described in Section 11 of Performance Specification 15; i.e. dynamic spiking. The commenter (54.1, 60.1) stated that it had over six years experience using a similar procedure for multi-metal CEMS initial installation and on-going quality assurance audits (OTM-16, 18, 21). The commenter (54.1, 60.1) recommended the continued use of OTM-16 and a quantitative aerosol generator (QAG®) for initial certification and on-going quality assurance audits of multi-metal CEMS; the QAG® is capable of challenging a CEMS with a wide range of concentrations that can cover the range of short term stack concentration variability as well as emission standards. The commenter (54.1, 60.1) recommended the continued use of the QAG® for initial certification and on-going quality assurance audits. The commenter (54.1, 60.1) does not recommend that EPA require use of EPA Method 29 for initial certification or periodic audits of multi-metals CEMS because Method 29 is less precise and less accurate than the QAG© and contemporary multi-metals GEMS; Method 29 would require emissions be in the dynamic range of both measurement's methods; Method 29 generates hazardous waste in both the sampling and analysis steps; and unlike the QAG©, Method 29 does not allow for on-site determination of certification/acceptance (instead, Method 29 requires four to eight weeks for results). The commenter (54.1, 60.1) stated that if the CEMS were to fail, an additional Method 29 audit would be required to repeat a relative accuracy test audit.

Response: The alternative initial accuracy determination procedure for multimetals CEMS are not promulgated. When they are promulgated, they will address this comment and include these recommendations.

Comment: One commenter (54.1, 60.1) does not recommend using draft Performance Specification 10 (PS-10) because it is not consistent with contemporary CEMS technology and requires relative accuracy test comparisons to a reference method (Method 29), which is generally less precise and less accurate than contemporary CEMS and reference aerosol generators. The commenter (54.1, 60.1) stated that the reference method (RM) is based on concentrations present in the typical stack gas, which may be at or near the reference methods detection limits and thus not be appropriate for comparison with a candidate method. The commenter (54.1, 60.1) stated that PS-10 does specify the multi-metal CEMS must be capable of measuring the total concentrations of the metals including Hg. The commenter (54.1, 60.1) agrees with this aspect of PS-10 and encourages the EPA to require the same of all multi-metals CEMS as well as mercury CEMS and RM.

Response: The alternative initial accuracy determination procedure for multimetals CEMS are not promulgated. When they are promulgated, they will address this comment and include these recommendations.

12.10 Sludge Content Monitoring as Alternative to Stack Test

Comment: Three commenters (75.1, 76.1, 97.1, 127.1) commented on using sludge concentrations for compliance with the EG and NSPS limits. One of these commenters (75.1) said that they feel that this option would make compliance and monitoring much less expensive for those POTWs who operate Industrial Waste Pretreatment Programs. Two of these commenters (76.1, 97.1, 127.1) urged EPA to adopt content monitoring of sewage sludge as an alternative to annual testing or continuous emission monitoring for all pollutants for which a correlation can be established between emissions and sludge content. One of these commenters (76.1) stated that 40 CFR 503 already allows for Pb and Cd compliance based on sludge content; the commenter requested EPA add Hg to this list through the proposed 129 regulations because the feed sludge concentrations provide a consistent monitoring point and resulting in known loading values to the SSI, annual source testing could be utilized to verify consistency with the monitored Hg loading and calculated removal efficiencies for any new treatment devices installed for the first five (5) years of operations, and if consistency is proven, annual source testing for Hg discontinued after the five year timeframe. The commenter (76.1) stated that monitoring Hg in the sludge over-estimates the incoming mercury to the plant by approximately 35% because of recycled Hg from scrubber water. Another commenter (97.1, 127.1) stated that

EPA's Office of Water regulates the average daily sludge content of cadmium, lead and mercury to ensure that SSI emissions stay below the health-based standards set under Part 503. The commenter (97.1, 127.1) stated that Part 503 requires a stack test to set the control efficiency of the control device for each metal; POTWs monitor the sludge feed and the moisture content and use this data to calculate the average daily sludge feed rate in dry tons per day. The commenter (97.1, 127.1) stated that POTWs also calculate a monthly average concentration of each pollutant based on all the sludge samples taken in a month. The commenter (97.1, 127.1) urged EPA to offer this approach to demonstrating compliance as an alternative to the PM surrogate limit in the Proposed Rule. The commenter (97.1, 127.1) argued that the Part 503 sampling procedure is something their members are familiar with and it will decrease the burden associated with complying with this new rule. The commenter (97.1, 127.1) stated that sludge sampling is a cost-effective way for units already regulated under Part 503 to demonstrate compliance with mercury emission limits, and is significantly less burdensome than installing and maintaining CEMS or performing annual stack tests. The commenter (97.1, 127.1) also supported using content monitoring for other pollutants (SO2, NOx, HCl) for which a correlation can be established between the content of the sewage sludge and the incinerator emissions. The commenter (97.1, 127.1) provided an example where SO2 stack testing with concurrent sulfur content monitoring can be used to establish a correlation between sludge concentration and emission rate.

Response: Section 129 of the CAA requires EPA to set emission limits for pollutants and demonstrate continuous compliance with the emission limits. For some pollutants, monitoring sludge content may be a viable means of compliance. But for other pollutants, such as CO, PCDD/PCDF, and NO_x, monitoring sludge content is not indicative of the emissions. EPA needs more data in order to allow the compliance option suggested by the commenters.

12.11 Other Performance Testing and Monitoring Concerns

Comment: One commenter (51.1) stated that they are aware of SSI units that accept and combust sewage sludge from other WWTPs. The commenter (51.1) is concerned that this practice is not addressed in the proposed requirements. The commenter (51.1) wanted to know how variable feed stocks should be handled relative to performance testing. The commenter (51.1) also asked whether the performance test represents the worst-case sludge composition, the sludge combusted in the highest quantity, or perhaps a weighted average?

Response: Any amount of sewage sludge combusted in an incinerator located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to the final SSI standards. SSI units are expected to have variable sludge compositions throughout the year due to seasonal changes and changes in the population generating wastewater. We do not believe its necessary, or even possible, to specify that performance tests represent specific sludge compositions.

Comment: One commenter (95.1) is concerned that EPA has proposed some emission limitations that are beyond the ability of the referenced test methods. The commenter (95.1) stated that Analytical Perspectives (a CRWI Associate Member and one of the laboratories that analyze dioxin/furan samples), prefers to work at a level of quantification (LOQ) of 14.5 TEQ pg/dscm for dioxin and furan samples. The commenter (95.1) stated that this is based on a sample time of three hours drawing a cubic meter per hour; the proposed dioxin/furan standard for new sources is 2.2 pg/dscm. The commenter (95.1) stated that to meet the LOQ for these units, a new sewage sludge incinerator would have to sample approximately 20 hours (14.5 ÷ 2.2 x 3 hours); while this is technically possible to accomplish, it runs into two practical problems. The commenter (95.1) stated that one problem is the OSHA restrictions for working greater than 16 hours at a time (in addition, the time to complete 20 hours of sampling is actually longer than 20 hours, considering the time to reach steady state conditions). The commenter (95.1) stated that the second problem is that it would be very difficult to keep the unit at constant conditions for over the 60 or more hours (three test runs to make a valid test condition) required to show that a unit would meet this standard.

Response: We disagree with the commenter about the conclusion that testing to show compliance with a mass emissions limit for dioxin and furans for this rule would require extraordinary sampling volumes and sample times. Although a laboratory may have a preferred level of quantitation (or other similar laboratory-derived reporting limit), this approach is at odds with the guidance we provided with the information collection request and with the reference test method. EPA's guidance to respondents for reporting pollutant emissions used to support the data collection specified the criteria for determining test-specific method detection levels, as required in Method 23 for measuring dioxin and furan concentrations (section 9.8), not arbitrary laboratory reporting levels. The final rule clarifies and reiterates the need to report D/F emissions concentration as prescribed in Method 23, on a mass basis and to follow the method's procedures for reporting values measured below the test-specific minimum detectable limit

Comment: One commenter (134.1) stated that most SSIs have a once-through water system, and pH is already measured and regulated under the NPDES permit so is not required in the proposed rule.

Response: We are not requiring pH testing of the discharge effluent; rather, we are requiring pH testing of the scrubber liquid.

Comment: One commenter (84.1, 119.1) argued that EPA must require actual emissions monitoring and not just parameter monitoring. The commenter (84.1, 119.1) cited the Clean Air Act and stated that §129 unambiguously requires EPA to establish actual emissions monitoring requirements for SSI (see 42 U.S.C. § 7429(c)). The commenter (84.1, 119.1) stated that EPA's regulations must require the owner of each unit "to monitor emissions from the unit at the point at which such emissions are emitted into the ambient air (or within the stack, combustion chamber or pollution control equipment as appropriate) and at such other points as necessary to protect health and the environment." The commenter (84.1, 119.1) stated that §129 provides that EPA's regulations must require owners to "monitor such other parameters relating to the operation of the unit and its pollution control technology as the Administration determines are appropriate." The commenter (84.1, 119.1) argued that despite the §129's plain mandate for actual emissions monitoring, EPA proposes to require only annual emissions testing and parameter monitoring. The commenter (84.1, 119.1) argued that given that actual emissions monitoring systems are available for SSI, the agency's failure to require actual emissions monitoring and to require only parameter monitoring is flatly unlawful. The commenter (84.1, 119.1) stated that if Congress had intended EPA to require only parameter monitoring, it would not have directed EPA to require actual emissions monitoring as well as any appropriate parameter monitoring.

Response: We are requiring emissions testing for all pollutants, with the option of CEMS or continuous sampling. In addition, we require parameter monitoring. In some cases, such as dioxin/furan monitoring, CEMS are not available for accurate monitoring. In these cases, we use CPMS to document continued operation of a source or control equipment in the same manner that occurred during the last performance test to ensure continuous compliance.

Comment: One commenter (97.1, 127.1) supported flexible compliance options allowing, but not mandating, CEMS for demonstrating compliance. The commenter (97.1, 127.1) also supported allowing sources to propose site-specific operation and maintenance plans with procedures for addressing missing CEMS data. The commenter (97.1, 127.1) stated that

providing small entities with a choice of compliance options is particularly important, as it will allow each POTW to independently assess which compliance option is most economical for that facility.

Response: EPA has revised the final rule. We are not requiring CEMS (with the exception of CO CEMS for new units); rather, CEMS are an optional method of compliance. We are requiring annual compliance testing and continuous parametric monitoring, with CEMS and continuous sampling with periodic sample analysis as approved alternatives. We have not included provisions to address missing data for concentration limits. While these are sometimes required for other emission limit formats (mass limit), they are not used in this rule.

Comment: One commenter (76.1) stated that EPA must acknowledge that reference methods for HCI, PM, Pb, and Cd are wet chemical methods and are not designed for 24 hours per day/7 days per week operation. The commenter (76.1) suggested EPA allow CEMS for NO_x, CO, and SO_2 in lieu of annual source testing; however, since CEMS, Integrated Sorbent Trap Dioxin Monitoring System (ISTDMS), or Integrated Sorbent Trap Mercury Monitoring System (ISTMMS) are unproven for HCI, Cd, PM, and Pb, EPA should delete these as options and only utilize annual source test requirements to quantify these parameters. Another commenter (129.1) stated that EPA must realize that with the exception of CO, the remaining CEMS (Cd, HCl, NO_x, PM, Pb, or SO_2) have never been successfully used to continuously monitor SSIs' exhaust stack gases due to the high moisture content of the exhaust gases and other interferences. Another commenter (121.1) argued that due to the high moisture content of SSI stack gases it is understood that measurement of a number of the pollutants listed in the proposed standards through a CEMS would be erroneous due to potential interferences.

Response: EPA disagrees. There are instruments available that operate with minimal interference from moisture. Moisture is a problem with COMS, and possibly with PM CEMS but these are not required by the rules. For existing SSI units, use of Cd, CO, HCl, NO_x, PM, Pb or SO_2 CEMS; ISTMMS; and ISTDMS (continuous sampling with periodic sample analysis) are approved alternatives to parametric monitoring and annual compliance testing. For new SSI units, CO CEMS are required, and use of Cd, HCl, NO_x, PM, Pb or SO_2 CEMS; ISTMMS; and ISTDMS (continuous sampling, with periodic sample analysis) are approved alternatives to parametric monitoring and annual compliance testing.

Comment: One commenter (134.1) disagreed with EPA proposing that the bypass stack be monitored because bypass stacks are only found on multiple hearth incinerators and are

typically only used during emergency malfunctions (loss of power). The commenter (134.1) stated that solids are not fed during startup and shutdown periods, and only burner emissions would be measured. One commenter (122) stated they were unclear to what extent the bypass stack must be monitored (including what parameters). The commenter (122) asked whether SSIs are required to install expensive continuous emissions monitoring equipment on the bypass stack for the rare occasion that a bypass occurs. The commenter (122) asked whether SSIs are required to do performance testing on bypass stacks. The commenter (122) stated that a bypass stack is intended to be a protective system designed for emergency situations that could otherwise jeopardize the incinerator or the pollution control equipment. The commenter (122) asked whether operators will be subject to violations and civil action due to bypasses that occur for emergency reasons. The commenter (122) stated that unless an operator intentionally operates the SSI with the bypass stack open, the emissions from the bypass stack are not significant to the overall SSI emissions during the course of an entire year. The commenter (122) stated that in a multiple hearth incinerator, when a bypass occurs, the sludge charge to the incinerator and the auxiliary fuel burners can be programmed to shut off, which immediately begins to result in the extinguishing of the combustion inside the incinerator, which will not commence again until such time as the system is once again operational.

Response: EPA is not requiring CEMS or performance testing for a bypass stack. However, you must install, maintain, and operate a device or method for measuring the use of the bypass stack, including date, time, and duration. The emission limits and standards apply to emissions from a bypass stack or vent while sewage sludge is in the combustion chamber (i.e., until the sewage sludge feed to the combustor has been cut off for a period of time not less than the sewage sludge incineration residence time). Therefore, use of the bypass stack at any time that sewage sludge is being charged to the SSI unit is an emissions standards deviation. The use of the bypass stack during a performance test would invalidate the performance test.

Comment: One commenter (76.1) agreed with EPA proposing that the bypass stack be monitored for date, time, and length of use. However, this commenter (76.1) as well as another commenter (97.1, 127.1) disagreed with EPA's view that "use of the bypass stack at any time that sewage sludge is being charged to the SSI unit is an emissions standards deviation". The commenters (76.1, 97.1, 127.1) argued that bypass stacks are an essential part of the safety equipment and operators should be allowed to open the bypass stack immediately as part of a continuous series of events that includes stopping the sludge feed without triggering a deviation.

The commenter (76.1) stated that the use of the bypass stack is not normal operations; any event that would cause use of the bypass stack would likely require sludge feed shut-down, but not instantaneously. The commenter (76.1) stated that the bypass stack is used if there is equipment breakdown which would result in filling the building with smoke and/or over pressure situation in the waste heat recovery boiler; this is an engineered safety component of SSI. The commenter (76.1) stated that bypass use could be caused by a plugged scrubber or loss of draft because the fan faults (variable speed drive fails or a power outage). The commenter (76.1) suggested that EPA revise this language for use during breakdown, 30 minutes at any one time, and not more than 120 minutes in any calendar year as this is more reasonable operationally than never allowing use of the designed safety device. The other commenter (97.1, 127.1) stated EPA does not have the authority to presume deviations of emission standards, particularly when the bypassed emission controls may not be necessary to meet the emission standard. The commenter (97.1, 127.1) stated that contemporaneous Part 503 data can show that the sludge content of cadmium, lead or mercury are so low that it could be met without operating a control device; use of a bypass stack must not be deemed a deviation of emission limitations for these compounds in the face of this credible contrary evidence. The commenter (97.1, 127.1) stated that assuming that the use of a bypass stack results in emission violations for all pollutants is arbitrary and recommended that subsection (d) of 40 CFR § 60.4900 be removed from the final rule.

Response: The malfunction provisions in the final rule enable the source to document an affirmative defense to deviations caused by a malfunction, including those events that require use of the bypass stack to address a process upset. It could also be used to show that emissions were below the standard at the time of release through the bypass stack.

Comment: One commenter (76.1) argued that the term "Continuous Monitoring Systems" (CMS) is not a normal part of air compliance vocabulary. The commenter (76.1) stated that in practice, there are two types of monitoring systems: the first is the traditional Continuous Emission Monitoring System (CEMS) where there is a direct measurement of the pollutants of concern such as NO_x, SO_2, and CO; the second type of monitoring system is called Parametric Monitoring (PM) and is where there is an indirect measure (temperature, flow, or pressure) for the pollutant of concern. The commenter (76.1) requested that EPA stop the use of Continuous Monitoring System (CMS) language and only use CEMS or PM.

Response: This term is defined in the General Provisions of parts 60 and 63.

Comment: One commenter (76.1) requested that EPA revise the definition of "out-of-control-period" for a CEMS or PM to be inoperative for at least 24 continuous hours. The commenter (76.1) stated that for a continuous emissions monitor that fails a calibration check, the "out-of-control period" begins the hour the zero or span check fail and ends the hour after completion of corrective action; this will look like a two hour violation even if an immediate repeat shows a good calibration. The commenter (76.1) asserted that this definition for "out-of-control-period" for CEMS and PM will generate significant amounts of unnecessary paper work. The commenter (76.1) stated that their current Title V permit allows CEMS and PM "out-of-control period" for up to 24 continuous hours before any notification to the local air district. The commenter (76.1) stated that if a CEMS or PM is inoperative, they have other monitors to show consistent and compliant operation during the time the CEMS or PM is inoperative.

Response: If the source provides data to show that they are in compliance, this will not be a problem. The General Provisions of Part 63 provide a definition of "out of control". The Part 63 approach for "out of control" was used for SSIs because it is not addressed in Part 60. This approach is consistent with EPA's most current approach on monitoring.

Comment: EPA requested comments on mandatory CO monitoring for SSIs. One commenter (76.1) objected to the requirement of a CO CEMS for existing MHFs. The commenter (76.1) argued that they already monitor for THC as required by 40 CFR 503 and noted that USEPA has already allowed the use of THC as a suitable substitute for CO.

Another commenter (76.1) supported the concept that easily measured parameters can be effective surrogates for direct measurements. The commenter (76.1) provided an example where EPA states the CO serves as an effective surrogate of 7-PAH and PCB. The commenter (76.1) stated that they do not support requirements for CO CEMS, but that they agree with EPA ruling 40 CFR 503 that THC is a suitable substitute for CO.

Response: We are not requiring CO monitoring for existing units. For existing SSI units, use of Cd, CO, HCl, NO_x, PM, Pb or SO_2 CEMS; ISTMMS; and ISTDMS (continuous sampling with periodic sample analysis) are approved options, to be used as an alternatives to parametric monitoring and annual compliance testing. For new SSI units, we are only requiring CO CEMS, and use of Cd, HCl, NOx, PM, Pb or SO2 CEMS; ISTMMS; and ISTDMS (continuous sampling, with periodic sample analysis) are approved alternatives to parametric monitoring and annual compliance testing. Additionally, we are not incorporating the alternative THC compliance requirement in the final rule. Section 129 requires that limits be set for each of the 9

regulated pollutants. Surrogates, such as THC, cannot be used in place of the regulated pollutants. Additionally, the proposed CO emission guidelines limit of 7.4 ppm for existing fluidized bed SSI units has changed in the final guidelines to 27 ppm, as discussed in Section IV of the preamble to the final rule.

Comment: One commenter (54.1, 60.1) suggested that alternate continuous measurement methods also be required for toxic components of PM such as multi-metal CEMS. The commenter (54.1, 60.1) provided numerous reasons why they support multi-metals CEMS including:

- EPA acknowledges that metals content in the sludge can be highly variable. Unless the sludge metals concentrations are continuously measured, metal emission rates cannot be controlled by restricting sludge incineration rates or monitoring other operational parameters. However, continuous metals monitoring of emissions with multi-metals CEMS would adequately characterize metals emissions despite variability in the sewage feed stock.
- Court required inclusion of emissions during SSM events further emphasizes the inadequacy of infrequent metals measurements during annual performance testing. Deviation reports will not include readily accessible hazardous metals emission data that could be attained with metals CEMS
- Commercial, multi-metals CEMS are well-established and have been operating on stacks for over 6 years. Multi-metals CEMS have all of the supporting performance specifications, on-going quality assurance procedures, certification and audit materials. Additionally the CES multi-metals CEMS was awarded EPA Clean Air Excellence Award, listed on EPA's Other Test Methods web site, etc.
- Although there is limited information concerning metal emissions to set standards, this situation will not improve until multi-metal CEMS are required.

Response: We recognize that an integrating multiple metals CEMS operates in a manner fundamentally different than the instrumental metals CEMS for which draft Performance Specification 10 was developed. Since EPA does not have a published performance specification for metals CEMS, instrumental or integrating, the source owner must prepare a site-specific monitoring plan in order to apply a multi-metals CEMS option. The monitoring plan need not imitate existing CEMS performance specifications (e.g., sampling frequency) but should be structured to address those characteristic operations of the CEMS reflecting the operating

principle and associated QA/QC procedures. At this time, without a promulgated performance specification for this type of CEMS, EPA has determined not to require its use in this rule.

13.0 RECORDKEEPING AND REPORTING REQUIREMENTS

Comment: One commenter (52.1) stated that because hazardous waste combustion units are very heavily regulated from both the CAA and RCRA programs, no separate notification should be required for HWC MACT units. The commenter stated that a notice that a hazardous waste combustor processes sewage sludge is redundant with existing EPA requirements, and that no additional oversight of these units is authorized under CAA section 129.

Response: No notification is required in the final rule. The final standards and guidelines do not apply to sewage sludge that is not burned in an SSI located at a wastewater treatment facility designed to treat domestic sewage sludge. Sewage sludge that is not burned in an SSI located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to other section 129 standards, such as the CISWI standards (40 CFR part 60, subparts CCCC and DDDD of this part), the OSWI standards (40 CFR part 60, subparts EEEE and FFFF), the MWC standards (40 CFR part 60, subparts Ea, Eb, Cb, AAAA, and BBBB of this part) or the Hazardous Waste Combustor rule (40 CFR part 63 subpart EEE).

Comment: One commenter (76.1) stated that for annual reporting, EPA wants the highest and lowest 3-hour averages for each pollutant and operating parameter; however, earlier in the rule, EPA said compliance will be based on 4-hour rolling averages. The commenter (76.1) stated that EPA should revise this requirement to be highest and lowest 4-hour rolling average.

Response: The final rule requires the highest and lowest average parameter value recorded. This information is not for a direct check against the averaging period, but to see the range of parameter operation during the reporting period.

Comment: One commenter (95.1) requested EPA allow 90 days to submit performance test reports in lieu of the 60 days proposed in §§60.4915(c) and 60.5235(c). The commenter (95.1) also requested that a provision be added for requesting additional reporting time. The commenter (95.1) argued that it will be difficult to get certain results back and reviewed within that time frame and close to impossible for dioxin samples without paying a premium. The commenter (95.1) stated that EPA's current methods have the following hold times for Method 23: 21 days to extraction and 40 days from extraction to analysis; and argued that recently, many laboratories have struggled to meet these holding times simply because of the large number of samples to be analyzed. The commenter (95.1) stated that adding the test results from all the units in this rule will further strain the system and may cause even longer delays.

Response: EPA thanks the commenters for their feedback. However, EPA maintains the time allowed for submitting performance tests is appropriate and been used in regulations for other source categories.

14.0 OPERATOR TRAINING AND QUALIFICATION REQUIREMENTS

Comment: One commenter (62.1) stated that they do not have an operator training program at this time. Another commenter (129.1) stated that their incinerator operators are Third Class State of Ohio Stationary Engineers. The commenter (129.1) stated that they feel this certification should suffice in lieu of annual training or testing. The commenter (129.1) also suggested that additional training and/or testing is only required if changes are made to the SSI system or in plant operating procedures or policies.

Other commenters (76.1) stated that annual updating of training material is an unreasonable requirement, unless there is a significant change to the SSI. The commenters (76.1) state that the training course content is to be determined by the State, since it is not detailed in the regulation. The commenter (76.1) claims that few states have the resources and the knowledge to create and implement an SSI operator training program; the commenter asserts that states should implement an SSI operator training program developed by EPA through the existing wastewater operator certification program. The commenters (76.1) questioned the need for a separate training and qualification program for SSIs given the rigorous operator certification programs already in place at the State level, including current State certification programs for wastewater treatment plants. The commenters (76.1) stated that adding an additional separate training and qualification program outside of the regulated operator training each state has in place is not cost effective. The same commenter (76.1) stated that California already has a certification program for wastewater treatment plant operators, but is unlikely to develop a separate SSI operator training program. The commenter (76.1) stated that there are only two agencies in the state which practice incineration and the state is in an economic crisis. The commenter (76.1) requested that the EPA model operator training program be designed for easy integration into the existing Wastewater Operator Certification program currently in place at each State.

Response: EPA does not agree that this is too burdensome. The final rule requires that qualified operators or supervisors complete an annual review or refresher course, and that they maintain plant-specific information, including training received through State/local programs, which is updated on an annual basis. EPA is of the opinion that States/programs can incorporate the required training into their existing training programs.

Comment: Some commenters (87.1, 112.1) supported the flexibility in the proposed rule that allows for the trained and qualified operator to operate the SSI or be the direct supervisor of one or more plant personnel who may operate the unit. The commenters (87.1, 112.1) also supported the proposed rule language that allows other knowledgeable plant personnel to operate the SSI when the qualified operator is not accessible for more than 8 hours, but requested that the time of allowable SSI operation be increased from 2 weeks to 4 weeks and that, so long as the training records of the replacement personnel are complete (showing review of the required information), that the absence of the qualified operator for a period less than or equal to four weeks not be deemed a deviation to be reported in the annual report.

Response: EPA thanks the commenters for their feedback. However, EPA disagrees that the time of allowable SSI operation be increased from 2 weeks to 4 weeks when the qualified operator is not accessible.

Comment: Some commenters (87.1, 112.1) expressed concern regarding the language in the proposed rule which provides that the training must be obtained through a State-approved program or by completing the training requirements outlined in the rule. The commenters (87.1, 112.1) stated that the proposed rule is silent as to whether the examination required in the rule should be conducted in writing; the commenters stated that the examination requirement of the proposed rule could envision an oral exam or, in addition, require a thesis. The commenters (87.1, 112.1) suggested that the proposed rule should direct the state program to develop written examinations following USEPA guidance that assure uniformity throughout the states, ensure objectivity, and improve efficiencies in grading and, thus, in certifications.

Response: EPA thanks the commenter for their suggestions. The required training must be documented that it has been completed. Typically, this documentation is a result of the trainee completing a written or electronic exam that is turned in and a certificate of proof is received.

15.0 STARTUP, SHUTDOWN, MALFUNCTION

15.1 Emission Limitations at All Times

Comment: Numerous commenters (65.1, 76.1, 80.1, 101.1, 105.1, 109.1, 137.1, 126.1) disagreed with EPA's proposed language requiring facilities to meet the proposed sewage sludge incineration standards "at all times" because it would be difficult to comply with certain proposed emission limits during startup and shutdown. Many of these commenters (65.1, 80.1, 101.1, 105.1, 137.1, 126.1) are specifically concerned about not being able to meet the proposed CO concentration limit upon startup of a SSI because when a heat up burner system is fired into a cold vessel, the flame tip is quenched before the combustion is completed creating a small flow of CO. One commenter (95.1) contended that EPA is proposing a new source CO standard without any evidence that it can be achieved during startup, shutdown, or malfunction; and provided an example of CO data from one hazardous waste combustor that averaged 2.2 ppmv during normal operations but averaged 48.6 ppmv during startup, 40.5 ppmv during shutdown, and 815.5 during malfunctions. One commenter (97.1, 127.1) stated that emissions of CO and PM can be expected to be elevated during startup when oxygen levels are higher due to lower combustion temperatures, resulting in higher pollutant concentrations when corrected to 7 percent oxygen. The commenter (97.1, 127.1) said that absolute pollutant levels tend to increase during startup and shutdown due to incomplete combustion that is unavoidable at lower temperatures; and the influence of unstable combustion may be more pronounced during shutdowns as the incinerator combusts the remaining sewage sludge for 30 minutes or more. The commenter (97.1, 127.1) recommended that EPA should account for situations where higher emissions occur during the time it takes to bring control equipment from startup to steady-state operations. Many commenters (76.1, 109.1, 134.1, 129.1, 105.1) had similar concerns. One commenter (76.1) urged EPA to change the regulation and allow 72 hour startup and shutdown relief from the 129 emission standards because a MH furnaces can take up to 72 hours for startup and/or shutdown because the refractory requires a gradual cool-down and startup to prevent cracking. Two commenters (76.1, 109.1) provided examples of the amount of time it takes to start a cold SSI. Two other commenters (134.1, 129.1) stated that for equipment and personnel protection, the inventory of material in an SSI must be burned out of the system as effectively as possible; however, it is unlikely that MACT standards could be met consistently by any SSI

during an emergency or abnormal shutdown condition. The commenters (134.1, 129.1) said this is particularly true of MH units, as these have inventories of unburned fuel on the order of 30-60 minutes, whereas FB systems typically only have a minute or two of unburned feed inventory. Another commenter (105.1) recommended that EPA allow an eight hour startup/shutdown/malfunction exemption from reporting and compliance requirements for CO, NO_x, and scrubber pressure drop. Another commenter (134.1) urged EPA to consider that at some point during startup of SSI units the introduction of wastewater solids, which are also fuel, is helpful to bring the combustion temperatures up to normal operating temperatures. The commenter (134.1) stated that until operating temperatures are reached, it is doubtful that this interim condition can meet all proposed MACT standards; and shutdown may be similar.

One commenter (95.1) argued that if EPA persists in applying numerical standards during periods of startup and shutdown, EPA should allow for an alternate oxygen correction during such events. The commenter (95.1) stated that during the first part of startup and the last part of shutdown, the oxygen concentrations will approach ambient concentrations; when it does that, the equation used to calculate the correction factor will approach infinity (dividing by zero). The commenter (95.1) stated that the HWC MACT rule allows facilities to set up an alternate correction factor for these conditions (See 40 CFR 63.1206(c)(2)(iii)).

Response: EPA is not promulgating a separate emission standard for the source category that applies during periods of startup and shutdown because EPA does not have data to support setting a separate standard during periods of startup and shutdown. EPA requested information in the NPRM; however, no data were provided. EPA also sought information on emissions during startup and shutdown as part of its section 114 request for information, but no source provided data.

Based on the information available at this time, EPA believes that SSI units will be able to meet the emission limits during periods of startup. The units for which emission test data were collected, as part of the Agency's CAA 114 information collected, indicated that they use natural gas, landfill gas, or distillate oil to start the unit and add waste once the unit has reached combustion temperatures. As EPA noted at proposal, emissions from burning natural gas, landfill gas or distillate fuel oil are expected to generally be lower than from burning solid wastes. When these start-up fuels are used, we anticipate that the SSI will reach operating temperatures rapidly, and any period where the temperature is below the operating temperature is expected to be generally short. Emissions during periods of shutdown are also generally lower than emissions

during normal operations because the materials in the incinerator would be almost fully combusted before shutdown occurs. EPA received no information during the public comment period that contradicted this conclusion.

We believe that sources will be able to demonstrate compliance with the final standards through use of continuous parametric monitoring and annual tests. The averaging period for operating limits is a 12-hour block average, and the average period for CO CEMS (only for demonstrating compliance with the CO limit for new sources) is a 24-hour block average. The averaging times should be sufficient during startup and shutdown operations as well as normal operations. Furthermore, the approach for establishing MACT floors for SSI units ranked individual SSI units based on actual performance for each pollutant and subcategory, with an appropriate accounting of emissions variability. Because emissions variability was accounted for, EPA believes any minor variability that may potentially occur during startup or shutdown has been adequately addressed.

We believe that sources will be able to demonstrate compliance with the final standards through use of continuous parametric monitoring and annual tests. The averaging period for operating limits is a 12-hour block average, and the average period for CO CEMS (only for demonstrating compliance with the CO limit for new sources) is a 24-hour block average. Sources are expected to be able to demonstrate compliance using these averaging times during startup and shutdown operations as well as normal operations. Again, commenters provided no data or other information to demonstrate that this would not be the case. Furthermore, the approach for establishing MACT floors for SSI units ranked individual SSI units based on actual performance for each pollutant and subcategory, with an appropriate accounting of emissions variability. Because emissions variability was accounted for, EPA believes any minor variability that may potentially occur during startup or shutdown has been adequately addressed. Commenters simply allege without providing any supporting information that EPA's variability analysis does not adequately account for startup and shutdown periods. Without any specific information, EPA has no basis to conclude that variability during these periods is actually greater than accounted for in EPA's analysis.

With respect to malfunctions, as is explained in the preamble, EPA has determined that CAA section 129 does not require that emissions that occur at such times be factored into development of CAA section 129 standards. Under section 129, emissions standards for new units must be no less stringent than the level "achieved" by the best controlled similar unit and

for existing units generally must be no less stringent than the average emission limitation "achieved" by the best performing 12 percent of units in the category. There is nothing in section 129 that directs the Agency to consider malfunctions in determining the level "achieved" by the best performing sources when setting emission standards. Moreover, while EPA accounts for variability in setting emissions standards consistent with the section 112 and 129 caselaw, nothing in that caselaw requires the Agency to consider malfunctions as part of that analysis.

Section 129 uses the concept of "best controlled" and "best performing" unit in defining the level of stringency that section 129 performance standards must meet. Applying the concept of "best controlled" or "best performing" to a unit that is malfunctioning presents significant difficulties, as malfunctions are sudden and unexpected events. Accounting for malfunctions would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. As such, the performance of units that are malfunctioning is not "reasonably" foreseeable. See, e.g., Sierra Club v EPA, 167 F. 3d 658, 662 (D.C.Cir. 1999) (EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem. We generally defer to an agency's decision to proceed on the basis of imperfect scientific information, rather than to "invest the resources to conduct the perfect study."). *See also*, Weyerhaeuser v Costle, 590 F.2d 1011, 1058 (D.C. Cir. 1978) (" In the nature of things, no general limit, individual permit, or even any upset provision can anticipate all upset situations. After a certain point, the transgression of regulatory limits caused by 'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication or insanity, and a variety of other eventualities, must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation."). In addition, the goal of a best controlled unit or best performing unit is to operate in such a way as to avoid malfunctions of the unit and accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning unit. EPA's approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute.

In the event that a source fails to comply with the applicable CAA section 129 standards as a result of a malfunction event, EPA would determine an appropriate response based on, among other things, the good faith efforts of the source to minimize emissions during

malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions. EPA would also consider whether the source's failure to comply with the CAA section 129 standard was, in fact, "sudden, infrequent, not reasonably preventable" and was not instead "caused in part by poor maintenance or careless operation." 40 C.F.R. § 60.2 (definition of malfunction). In addition, as discussed in more detail in the preamble and elsewhere in this response to comment document, EPA has promulgated an affirmative defense to civil penalties for exceedances of emission limits that are caused by malfunctions.

With respect to calculating compliance with the 24-hour average CO emissions limit (corrected to 7 percent O_2), we agree that there is an algebraic anomaly that occurs because of the format of the standard and we have corrected that by providing that during start-up and shut-down, the correction to 7 percent O_2 does not apply to the CO concentrations as measured by the CEMS, and that the CO concentrations measured during such periods will be averaged with the CO concentrations (corrected to 7 percent O_2) measured during other operating periods to calculate the 24-hour average.

Comment: Some commenters (65.1, 76.1, 97.1, 127.1, 101.1, 126.1) articulated that EPA should, at the minimum, define "at all times" as "at all times while feeding sludge".

Response: We maintain that the emission limits must be complied with at all times.

Comment: Some commenters (86.1, 108.1, 95.1) noted that there is no data available for periods of startup, shutdown, malfunction, or feed rate change. One commenter (91.1) is concerned that they do not have sufficient information to comment on whether in fact the emission limitations EPA has proposed for normal operations of SSI units can also be met during startup and shutdown. Two commenters (134.1, 95.1) are concerned that insufficient testing has been done to support EPA's assumption that startup and shutdown will meet MACT standards. Commenters (134.1, 95.1) stated that there appears to be no data on SSI emissions under these conditions. One commenter (91.1) stated that data from similar types of combustion units (i.e., boilers) clearly demonstrate that emissions during startup and shutdown are much different than during normal operation; and it is reasonable to believe that SSI units would experience similar conditions during startup and shutdown, since they are enclosed combustion devices like boilers. At least one commenter (95.1) stated that the floor standards must be capable of being met under the most adverse circumstances reasonably expected to occur (such as malfunctions) anywhere in the country, citing National Lime Association v. EPA, 627 F.2d 416, 433 (D.C. Cir. 1980), and

rejected EPA's determination that the standards are not required to reflect periods of malfunction.

The commenter (91.1) also argued that EPA cannot conclude that special provisions for emissions during startup and shutdown are not needed based on mere speculation (referenced NRDC v. EPA, 859 F.2d 156, 210 (D.C. Cir. 1988)). The commenter (91.1) stated that EPA's bare assumptions that emissions are expected "to be lower, generally" (asserting that emissions from burning natural gas, landfill gas, or distillate oil before adding waste to the SSI unit are expected to generally be lower than from burning solid wastes and that emissions during shutdowns are also generally lower than emissions during normal operations because the materials in the incinerator would be almost fully combusted before shutdown occurs) do not constitute a demonstration that applying the proposed emission limitations during startup and shutdown reflects the performance of the best-performing SSI units under CAA section 129(a)(2) or is adequately demonstrated to be achievable through the application of the best system of emission reduction under CAA section 111(a)(1).

Another commenter (134.1) stated that periods of startup, shutdown, and malfunctions are transition operating modes that, while often pseudo-controlled, are basically unstable conditions and elevated emissions would be expected under these conditions. The commenter (134.1) is concerned that not all of the proposed limits can be met during these transient operations and recommended the transition operating modes be excluded from compliance enforcement periods. The commenter (134.1) argued that SSI processes are controlled, but not inherently stable, particularly for MH systems; even FB systems are only somewhat stable processes, though they are more able to accommodate sudden or rapid changes than MH systems. The commenter (134.1) asserts that this is one of the reasons that it is necessary to average three one to two-hour or longer test runs in order to generate a single representative performance test measurement that can be reasonably used as evidence of system performance capability under the particular test conditions. The commenter (134.1) stated that to extrapolate test performance to a level that can be met continuously requires some adjustment to allow for changing conditions beyond the envelope described by those in effect during the more ideal steady-state performance test.

Response: EPA is not promulgating a separate emission standard for the source category that applies during periods of startup and shutdown because EPA does not have data to support setting a separate standard during periods of startup and shutdown. As part of EPA's information

collection effort for this rulemaking, EPA requested information regarding startup and shutdown emissions, but did not receive any relevant data in response, or in response to requests in the preamble to the proposed rule. The units for which emission test data were collected from use natural gas, landfill gas, or distillate oil to start the unit and add waste once the unit has reached combustion temperatures. Emissions from burning natural gas, landfill gas or distillate fuel oil are expected to generally be lower than from burning solid wastes (i.e., natural gas has lower (or none) metals, chlorine, etc., than sewage sludge). When these start-up fuels are used, we anticipate that the SSI will reach operating temperatures rapidly, and any period where the temperature is below the operating temperature is expected to be generally short. Emissions during periods of shutdown are also generally lower than emissions during normal operations because the materials in the incinerator would be almost fully combusted before shutdown occurs. As explained above, commenters provided no data or information to dispute this conclusion.

For the reasons described in the above responses, EPA's approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute

Comment: One commenter (54.1, 60.1) argued that annual performance testing will not characterize HAP emissions related to malfunctions of the SSI processes. The commenter (54.1, 60.1) agreed with EPA's statement that it "recognizes that event equipment that is properly designed and maintained can fail and that such failure can sometimes cause an exceedence of the relevant emission standard." The commenter (54.1, 60.1) argued that continuous monitoring is the only method of characterizing and quantifying HAP emissions at the SSI during normal operations as well as malfunction events. The commenter (54.1, 60.1) recommended that in order to comply with the recent U.S. Court of Appeals decision (that MACT performance standards should be applied at all times), multi-metals CEMS should be required to monitor for required parameters Cd, Pb, and Hg. The commenter (54.1, 60.1) argued that the proposed rule does not follow the court's ruling to include malfunction emissions in total emissions. The commenter (54.1, 60.1) stated that in the case of hazardous metals, malfunction events can dominate total emissions and without continuous metals emission data from a multi-metal CEMS, it will not be possible to: (1) evaluate the substantial risks associated with metal emissions; or (2) determine compliance with standards.

Response: Section 129 of the Clean Air Act requires EPA to set emission standards for 9 pollutants, including PM, Hg, Cd, and Pb, which we have done in this final rule. The rule

requires periodic performance testing to demonstrate compliance with the emission limits with contemporaneous collection of process and control device operating conditions to use in establishing enforceable operating limits sufficient to assure continuous compliance. We believe that the combination of periodic performance testing and continuous monitoring of site-specific operating limits tied to the performance testing will provide assurance of compliance. In addition, for existing SSI units, the rule allows the use of Cd, CO, HCl, NO_x, PM, Pb or SO_2 CEMS; ISTMMS; and ISTDMS (continuous sampling with periodic sample analysis) as approved alternatives to the parametric monitoring and annual compliance testing. For new SSI units, CO CEMS are required for determining continuous compliance, and use of Cd, HCl, NO_x, PM, Pb or SO_2 CEMS; ISTMMS; and ISTDMS (continuous sampling, with periodic sample analysis) are approved alternatives to parametric monitoring and annual compliance testing.

Additionally, at this time, EPA does not have a promulgated performance specification for multi-metal CEMS and therefore it is not appropriate to use to demonstrate compliance.

15.2 Application of Sierra Club Decision to 111/129

Comment: Some commenters (97.1, 127.1, 91.1) argued that EPA incorrectly claims that its authority to prescribe unique standards for SSM periods is constrained by Sierra Club v. EPA, 551 F.3d 1019 (D.C. Cir. 2008). These commenters (97.1, 127.1, 91.1) stated that EPA has failed to account adequately for emissions that occur during SSM periods. One commenter (91.1) argued that the D.C. Circuit‘s Sierra Club decision manifestly is not binding on EPA‘s establishment of performance standards for SSI units under CAA sections 111 and 129. The commenter (91.1) contended that the Sierra Club decision interpreted section 112, not section 129 (which incorporates by reference section 111), and pointed out that this interpretation is not merely a technical distinction. The commenter (91.1) referred to the language that the D.C. Circuit considered dispositive in interpreting EPA‘s standards-setting authority under section 112 (the statement in the definition of emission limitation and emission standard that it limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis) as having been in the statute since 1977. The commenter (91.1) pointed out that since 1977, EPA has exempted emissions during SSM events from compliance with NSPS under CAA section 111 (referenced 40 CFR §60.8(c)). The commenter (91.1) argued that congress enacted the continuous basis language in section 302(k) knowing that EPA‘s emissions standards under section 111 exempted SSM periods, and pointed out that there is nothing in the legislative history

of the 1977 amendments to the CAA that suggests congress intended to overturn that practice. The commenter (91.1) referenced 551 F.3d at 1027, citing Kamp v. Hernandez, 752 F.2d 1444, 1452 (9th Cir.1985), and stated that it had nothing to do with limitations applied during SSM nor with EPA‘s established practice of exempting excess emissions during SSM events from its performance standards.

One commenter (91.1) argued that the Sierra Club decision does not prevent EPA from adopting emission standards for SSM periods that are different from those required during periods of normal operation. Commenter (91.1, 97.1, 127.1) stated that while it is true that a blanket exemption from any standard may be inconsistent with the Sierra Club holding, the opinion does not prohibit EPA from applying different, even non-numerical, standards during SSM events from those standards that apply during steady-state operations. The commenters (91.1, 97.1, 127.1) stated that the Sierra Club decision only rejected EPA‘s assertion that it had discretion to decide not to impose any emission standard whatsoever during SSM periods (referenced id. at 1027-28, 1030); and in fact, Sierra Club acknowledged that the definition of emission standard in §302(k) indicates that any one standard need not apply at all times. The commenters (97.1, 127.1) stated that the court noted that the Part 63 General Provisions at issue in Sierra Club were not a design, equipment, work practice, or operational standard under § 112(h) and expressly did not decide whether EPA could promulgate a work practice or engineering standard under CAA §112(h) (much less under the analogous §111(h)) instead of the exemption EPA sought to defend (See 551 F.3d at 1028).

Response: As explained in the preamble to the proposed rule and in the preamble for today’s final rule and elsewhere in this response to comment document, EPA appropriately took startup and shutdown periods into account in setting standards. EPA does not claim that the *Sierra Club* case constrains its authority to prescribe unique standards for SSM periods or directly addresses the legality of SSM exemptions for section 129 standards. EPA’s view is that the reasoning of the *Sierra Club* decision calls into question the legality of source category-specific SSM exemptions in rules promulgated pursuant to section 129. With respect to malfunctions, as explained in more detail elsewhere in this response to comment document, EPA’s approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute.

EPA disagrees with commenters’ suggestion that the existence of an SSM exemption in rules implementing section 111 in 1977 when Congress enacted the “continuous basis” language

in the definition of "emission standard" is evidence that Congress approved of that regulatory SSM exemption. Commenters fail to cite legislative history or any other evidence supporting that Congress was aware or approved of that exemption.

EPA disagrees with the comment that it can establish work practice standards in lieu of deriving limitations on the mass or concentration of pollutants emitted during startup or shutdown under section 129. The commenter who suggested this approach cited CAA Section 112(h) and 111(h) as the basis of authority for establishing work practice standards, but Section 129 requires numeric emission standards for the pollutants specified in Section 129(a)(4). See 74 Fed. Reg. 51,395 (Oct. 6, 2009). In any event, EPA's approach to malfunctions is the same irrespective of the form of the standard at issue. See above responses addressing EPA's approach to malfunctions.

EPA also disagrees with the commenter that contends that the *Sierra Club* decision addresses in any way EPA's current approach to malfunctions. Consistent with *Sierra Club*, we have issued standards that apply at all times, including during malfunctions.

15.3 Different/Alternate Standards for SSM

Comment: One commenter (91.1) recommended EPA revise the proposed standards to account better for SSM events, rather than rely on an affirmative defense to make up for its failure to do so. One commenter (97.1, 127.1) stated that the reality of the technological challenges, and the enormous potential cost that would be necessary to monitor SSIs during SSM, give EPA the basis to prescribe alternative design, equipment, work practice or operational standards for SSM. The commenter (97.1, 127.1) asked EPA to reconsider its SSM approach and to allow for alternative work practice standards for SSM events in the form of a facility-specific SSM plan. The commenter (97.1, 127.1) recommended EPA consider a flexible compliance option that allows the source to elect to comply with the MACT floor emission standards for normal operating conditions or with the requirements of the SSM plan for the SSM event. Another commenter (95.1) argued that in the absence of data and in the absence of a credible methodology to develop data (even if one can be developed which is not certain), EPA could use a work practice under § 111(h) to address this situation where a methodology to develop a standard of performance is not feasible due to technological constraints.

One commenter (91.1) recommended that EPA conduct stack testing during startup and shutdown events, but also acknowledged that emissions testing during startup and shutdown will

not be an option in all cases. The commenter (91.1) stated that if the Proposed Regulations are adopted, EPA should be able to use continuous monitoring data to set alternative emission standards that apply during startup and shutdown, or conclude that sources with the identified control technology will be able to meet emission limitations established for normal operations during startup and shutdown periods, as well. The commenter (91.1) suggested that continuous monitoring data during some SSM events should be possible for the next review of SSI emission standards, from those facilities that opt to use the continuous emission monitor option in the Proposed Rule, since the Proposed Rule would require such facilities to operate and report data from continuous monitors even during SSM events other than during monitor malfunction or downtime. The commenter (91.1) also suggested that EPA could study facilities'operational logs to determine an averaging time for an emission standard sufficiently long that typical startups and shutdowns would not cause an exceedance of the standard. The commenter (91.1) further suggested that EPA might determine, based on infeasibility of collecting representative data during startup and shutdown events, that it is necessary and appropriate to promulgate a design, equipment, work practice, or operational standard, pursuant to CAA section 111(h) and/or section 302(k), in lieu of deriving limitations on the mass or concentration of pollutants emitted during startup or shutdown. The commenter (91.1) also provided several options that EPA could use for setting performance standards under CAA sections 111 and 129 that would apply during malfunction events.

Response: We thank the commenters for their suggestion on further data gathering. As explained above, EPA collected emissions test data from SSIs owned by nine entities for purposes of this rulemaking. We also requested any additional emissions data in the preamble to the proposed rule. However, we did not receive any data during startup and shutdown in response to that request. For the reasons explained above, EPA is not promulgating a separate emission standard for the source category that applies during periods of startup and shutdown.

With respect to commenters' suggestion concerning work practice standards, Section 129 requires numeric emissions standards for the pollutants specified in Section 129(a)(4). Therefore, EPA does not have the authority to establish work practice standards for sources regulated under section 129. With respect to malfunctions, as explained in more detail elsewhere in this response to comment document, EPA's approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute.

Comment: One commenter (91.1) provided examples where courts have recognized that a technology based standard discards its fundamental premise when it ignores the limits inherent in technology (NRDC v. EPA, 859 F.2d 156, 208 (D.C. Cir. 1988)). The commenter (91.1) stated that the D.C. Circuit recognized, in Portland Cement Ass'n v. Ruckelshaus, 486 F.2d 375, 398 (D.C. Cir. 1973), a decision reviewing standards under CAA section 111, that startup and upset conditions due to plant or emission device malfunction, is an inescapable aspect of industrial life and that allowance must be made for such factors in the standards that are promulgated (Id. at 399). Similarly, the commenter (91.1) mentioned Essex Chem. Corp. v. Ruckelshaus, 486 F.2d 427, 432 (D.C. Cir. 1973), cert. denied, 416 U.S. 969 (1974), another section 111 case, the court held that SSM provisions are necessary to preserve the reasonableness of the standards as a whole (Id. at 433). The commenter (91.1) also mentioned National Lime Ass'n v. EPA, 627 F.2d 416 (D.C. Cir. 1980), another case reviewing emission standards promulgated under CAA section 111, the court held CAA technology-based standards must be capable of being met under most adverse circumstances which can reasonably be expected to recur, such as during periods of SSM (627 F.2d at 431 n.46).

Response: There is nothing in the plain language of the statute or in caselaw addressing section 129 that directs the Agency to consider malfunctions in determining the level "achieved" by the best performing sources for purposes of setting standards under section 129. As explained in the preamble and elsewhere in this response to comment document, EPA's approach to malfunctions is a reasonable interpretation of the requirements of section 129. The relevance of Portland Cement and Essex Chem Corp. is questionable in light of subsequent caselaw and the 1977 amendments to the Clean Air Act's definition of "emission standard" requiring that such standards be continuous. Further, the NRDC case interprets provisions of the Clean Water Act that are different in nature than provisions governing standards under section 129 of the Clean Air Act.

In any event, even if those cases are relevant, EPA's overall approach to malfunction events in this rule, including the promulgation of an affirmative defense, is consistent with the approach set forth in EPA's 1972 proposed rules cited favorably in Portland Cement and Essex Chemical in that both EPA's approach today and in 1972 "impart a construction of "reasonableness" to the standards as a whole and adopts a more flexible system of regulation than can be had by a system devoid of "give." Portland Cement at 399. Portland Cement and Essex criticized EPA regulations that contained no specific provisions to address malfunctions

and EPA's assertion that malfunctions would be dealt with by the informal exercise of discretion in the Agency's enforcement activities. Those decisions did not require exemptions or less stringent standards for malfunction events as the commenter suggests. EPA's approach to malfunctions goes further than reliance on the informal exercise of enforcement discretion in that it includes regulatory provisions establishing an affirmative defense to civil penalties for exceedances of emission limits that are caused by malfunctions.

As noted above, the NRDC v EPA, 859 F. 2d 156, 207(D.C. Cir. 1988) case cited by the commenter is not on point and the discussion of technology-based standards is dicta. Nevertheless, EPA's approach to malfunctions is consistent with NRDC. NRDC does not require exemptions or less stringent standards for malfunctions either. Further, the regulatory affirmative defense included in today's final rule is consistent with the case cited in the NRDC decision; Marathon Oil Co. v. EPA, 564 F.2d 1253, 1272 (9th Cir. 1977). The court in Marathon Oil held that EPA must formalize its approach to upsets under the Clean Water Act. The affirmative defense does so. But see, Weyerhaeuser v Costle, 590 F.2d 1011, 1057-58 (D.C. Cir. 1978) (holding that an informal approach is adequate).

15.4 MACT Floor Analysis as it Applies to SSM

Comment: One commenter (97.1, 127.1) asserted that EPA's "determination" that malfunctions are not distinct operating conditions is simply an unjustified decision to ignore the impact that the inherent limitations of combustion and pollution control technologies have on the ability of SSIs to achieve the proposed standards. The commenter (97.1, 127.1) stated that EPA declines to use emissions during malfunction periods in its MACT floor analysis for normal operating conditions and fails entirely to address its authority under §111(h) to set alternative work practice and engineering standards. The commenter (97.1, 127.1) argued that EPA's only explanation for this decision (the suggestion that applying the MACT floor concept of "best performing" to a source experiencing a malfunction "presents significant difficulties" (see 75 Fed. Reg. at 63283)) has no basis in the CAA, which requires EPA to distinguish among types and classes of sources in order to set achievable emission standards and which allows EPA to use a variety of alternative work practice standards when setting an emission standard is too difficult. Commenters (91.1, 97.1, 127.1) stated that EPA's argument leads it to ignore the fact that there are work practices employed by the best performing SSIs that represent the best practices for minimizing emissions during a malfunction. The commenter (97.1, 127.1) stated that these

practices may include monitoring combustion parameters to identify a malfunction and stopping the charging of materials to an incinerator. Commenters (91.1, 97.1, 127.1) stated that while the measures that represent these best practices will depend on facility-specific issues, such as incinerator design, pollution control train, and other factors, they are nonetheless the best technological system of continuous emission reduction, adequately demonstrated. The commenters (91.1) disputed that EPA cannot hide behind the Sierra Club decision as a justification for ignoring the inability of even the best performers to achieve the proposed emission standards during SSM events. The commenter (91.1) pointed out that the CAA section 129 (a)(2), which incorporates the same MACT requirements for solid waste incinerators as CAA section 112(d) applies to sources of hazardous air pollutants, mandates that the emission standards be achievable. The commenter (91.1) argued that an emission limitation that applies during SSM events has not been demonstrated to be achieved by the best-performing 12% of units in the category unless EPA can show that those best performers actually meet that emission limitation during SSM events. Moreover, the commenter (91.1) stated that if EPA sets the emission standards based on the best performing 12% of units in the category (the MACT floor), those limitations must on average be achieved by the best performers. The commenter (91.1) stated that although one goal of best performing sources is to operate in such a way as to avoid malfunctions of their units, there is no basis for EPA‘s conclusion that malfunction events are not representative of best-performing sources. The commenter (91.1) stated that many types of sources are required by many state agencies to submit deviation reports or malfunction reports when they experience a malfunction that causes an exceedance of an applicable limitation; however, EPA does not appear to have made any attempt to obtain and analyze such reports, in order to assess what type of requirement might reasonably apply to SSI units during malfunctions. The commenter (91.1) also pointed out that the CAA section 111(a)(1) requires that any emission limitation be achievable through the application of emission reduction technology that the Administrator determines has been adequately demonstrated and therefore EPA must demonstrate that a numerical limitation, if it is to apply even during SSM events, is in fact achievable with available technology during such events.

Response: For the reasons explained above, EPA is not promulgating a separate emission standard for the source category that applies during periods of startup and shutdown. With respect to the commenter’s suggestion to establish work practice standards for malfunctions, Section 129 requires numeric emissions standards for the pollutants specified in Section

129(a)(4). In any event, EPA's approach to malfunctions is the same irrespective of the form of the standard at issue. As explained in the preamble to the proposed rule and elsewhere in this response to comment document, nothing in section 129 requires that EPA anticipate and account for the innumerable types of potential malfunction events in setting emissions standards. There is nothing in section 129 that directs the Agency to consider malfunctions in determining the level "achieved" by the best performing sources when setting emission standards. Moreover, while EPA accounts for variability in setting emissions standards consistent with the section 112 and 129 caselaw, nothing in that caselaw requires the Agency to consider malfunctions as part of that analysis.

Section 129 uses the concept of "best controlled" and "best performing" unit in defining the level of stringency that section 129 performance standards must meet. Applying the concept of "best controlled" or "best performing" to a unit that is malfunctioning presents significant difficulties, as malfunctions are sudden and unexpected events. Accounting for malfunctions would be difficult, if not impossible, given the myriad different types of malfunctions that can occur across all sources in the category and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. As such, the performance of units that are malfunctioning is not "reasonably" foreseeable. See, e.g., Sierra Club v EPA, 167 F. 3d 658, 662 (D.C.Cir. 1999) (EPA typically has wide latitude in determining the extent of data-gathering necessary to solve a problem. We generally defer to an agency's decision to proceed on the basis of imperfect scientific information, rather than to "invest the resources to conduct the perfect study."). See also, Weyerhaeuser v Costle, 590 F.2d 1011, 1058 (D.C. Cir. 1978) (" In the nature of things, no general limit, individual permit, or even any upset provision can anticipate all upset situations. After a certain point, the transgression of regulatory limits caused by 'uncontrollable acts of third parties,' such as strikes, sabotage, operator intoxication or insanity, and a variety of other eventualities, must be a matter for the administrative exercise of case-by-case enforcement discretion, not for specification in advance by regulation."). In addition, the goal of a best controlled unit or best performing unit is to operate in such a way as to avoid malfunctions of the unit and accounting for malfunctions could lead to standards that are significantly less stringent than levels that are achieved by a well-performing non-malfunctioning unit. EPA's approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute.

Indeed, commenters' observation that the "measures that represent these best practices will depend on facility-specific issues" supports EPA's view that it would be impracticable to establish emissions standards for an entire source category or subcategory that takes

Comment: One commenter (91.1) argued, by virtue of the variability analysis itself, the Proposed Standards are representative of emissions achieved during normal (very stable) operations and are not representative of emissions during SSM events (which can be highly variable). The commenter (91.1) stated that the variability EPA used in setting the Proposed Standard reflects at most only the normal variation in emissions experienced during normal operations because the analysis was performed on emissions data from performance tests, when the source is being operated at normal levels and when efforts are being made to maintain steady-state conditions. The commenter (91.1) purported that since performance test data are not collected during SSM events, the variability factors EPA derived to establish the Proposed Standards could not possibly incorporate emissions variability experienced during SSM events. One commenter (95.1) specifically noted that EPA's own National Stack Testing Guidance precludes and possibly prohibits the development of emission-based standards that apply during periods of startup, shutdown, or malfunction ("Operations during periods of startup, shutdown, and malfunction do not constitute representative conditions for the purposes of a performance test." Section VII. 5 of the September 30, 2005 Final Clean Air Act National Stack Testing Guidance). The commenter (95.1) stated that even if a facility had such data, EPA would not have accepted it in a test report according to this guidance, much less have incorporated it into an emissions database based on compliance test reports.

Commenter (91.1) and another commenter (97.1, 127.1) stated that for these same reasons, EPA's attempt to consider variability in setting emission standards does not eliminate the need for different standards that apply during malfunctions. The commenter (95.1) argued similar points regarding variability. The commenter (95.1) stated that if EPA decides to require facilities to meet the same emission standards under both normal operations and during malfunctions, EPA must use data from both normal operations and malfunctions in developing those standards.

Response: As explained above, EPA is not promulgating a separate emission standard for the source category that applies during periods of startup and shutdown and expects that sources will be able to meet the emission limits during such periods. Moreover, EPA requested data regarding emissions during startup and shutdown, and commenters failed to provide any

additional data during the comment period. For the reasons explained above, EPA has adequately accounted for startup and shutdown periods in the final emissions standards, based on the available information.

Periods of startup, normal operations, and shutdown are predictable and routine aspects of a source's operations. However, by contrast, malfunction is defined as a "sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment or a process to operate in a normal or usual manner * * * "(40 CFR 60.2). EPA has determined that malfunctions should not be viewed as a distinct operating mode and, therefore, any emissions that occur at such times do not need to be factored into development of CAA section 129 standards, which, once promulgated, apply at all times. Nothing in CAA section 129 or in case law requires that EPA anticipate and account for the innumerable types of potential malfunction events in setting emission standards.

For the reasons described in the above responses, EPA's approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute.

Nothing in the National Stack Testing Guidelines cited by commenter addresses whether standards can apply during periods of startup and shutdown or periods of malfunction. We have explained elsewhere in this response to comment document the basis for our startup and shutdown standards and the basis for our approach to malfunctions. We have also explained elsewhere in this response to comment document how compliance can be determined during such periods.

Comment: One commenter (91.1) asserted that EPA is going beyond the MACT floor without making the demonstrations that the statute and case law require EPA to make in order to impose beyond-the-floor MACT standards. The commenter (91.1) stated that this is especially obvious when one considers the multitude of conditions EPA proposes to impose on sources during malfunctions, in order to be excused from civil penalties: EPA makes no attempt to justify those conditions as reasonable, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements (referenced CAA section 129(a)(2)).

Response: EPA is not setting a beyond-the-floor standard. For the reasons described in the above responses, EPA's approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute.

15.5 Format of Affirmative Defense

Comment: The commenter (91.1) disagreed with EPA's affirmative defense option and argued that inclusion of the affirmative defense does not cure EPA's failure to set emission standards that are achievable during SSM events. The commenter (91.1) urged EPA to promulgate an emission standard that eliminates the situation where SSI units sometimes will be unable to comply with the Proposed Standards because of malfunctions, even if their equipment is properly designed and maintained, through no fault of the source. The commenter (91.1) recommended that SSI units be subject to differentiated requirements, achievable with the identified best technology, during SSM events. The commenter (91.1) argued that the proposed affirmative defense shifts the burden to the source to prove that a myriad number of criteria are met and actions were taken by the source (which bear no direct relation to the statutory factors for performance standards under CAA sections 111 and 129), in order to avoid civil penalties.

Response: With respect to malfunctions, as explained in the proposed and final rules and in more detail elsewhere in this response to comment document, EPA has determined that CAA section 129 does not require that emissions that occur at such times be factored into development of CAA section 129 standards and that it is reasonable not to do so.

The affirmative defense does not change the burden of proof with respect to establishing a violation. The burden of proof remains with the plaintiff in an enforcement action. See, e.g., 40 C.F.R. 22.24. If a violation has been established and a source wishes to assert the affirmative defense, the source does bear the burden of establishing that the elements of the affirmative defense have been met. This burden-shifting is appropriate because the source is in a better position to determine the facts required to establish the defense. *See, e.g., Arizona Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to EPA's use of an affirmative defense to address excess emissions during malfunction events.). With respect to EPA's justification for the affirmative defense criteria, see EPA's responses to comment below.

Comment: One commenter (91.1) said that EPA needs to substantially revise and streamline the proposed affirmative defense for it to be of practical value, and argued that many aspects of the affirmative defense would make it unavailable as a practical matter for many, if not most malfunctions. The commenter (91.1) stated that many of these limitations on the affirmative defense also are not directly related to the question of whether an exceedance of the emission limitations due to a malfunction should be excused. One commenter (91.1) stated that

several of the conditions for establishing an affirmative defense use phrases that are subject to a wide range of interpretations, and that on their face do not recognize any need for reasonableness or cost-effectiveness. The commenter asked how will the enforcement authority, or a judge, determine whether "proper design" or "better operation and maintenance practices" could have prevented a malfunction (section 60.4861(a)(1)(ii)), whether a recurring malfunction is a result of "inadequate design" (section 60.4861(a)(1)(iv)), whether repairs were made "as expeditiously as possible" (section 60.4861(a)(2)), whether the source took "all possible steps" to minimize the impact of the excess emissions (section 60.4861(a)(5)), and whether emissions control systems "were kept in operation if at all possible" (section 60.4861(a)(6)). Two other commenters (97.1, 127.1, 95.1) had similar concerns. The commenter (85.1) recommended that EPA drop the reference to "any" activity in 60.4861(a)(1)(iii). The commenter (85.1) is concerned that there are several references to "All" that would make it difficult to ever satisfy the affirmative defense (or rebuttable presumption). The commenters (91.1, 97.1, 127.1, 95.1) argued that at a minimum, the vague and unqualified descriptors in the criteria for demonstrating the affirmative defense will inevitably lead to varying conclusions as to whether a violation has occurred, resulting in inconsistency from one jurisdiction to the next. The commenter (95.1) suggested several modifications to the regulatory language.

Response: EPA does not agree that the affirmative defense criteria are overly vague and will result in varying interpretations. Courts are well equipped and often do evaluate and apply criteria that are subject to differing interpretations. Many of the conditions were modeled after the conditions of the affirmative defense in EPA's SIP SSM policy, which several states have adopted into their SIPs.

We do not have any indication that parties to enforcement proceedings have had any significant difficulties applying the terms of these SIP affirmative defenses. (See, e.g., State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999); Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions (Feb. 15, 1983)). Other conditions are modeled after a Federal Implementation promulgated by EPA. (40 C.F.R. 50.1312). EPA's view is that use of consistent terms in establishing affirmative defense regulations and policies across various CAA programs will promote consistent implementation of those rules and policies. However, EPA agrees that some of the terms or phrases in the regulatory text establishing the affirmative can be

revised or streamlined to some extent. Such revisions are discussed elsewhere in this response to comment document.

Comment: One commenter (91.1) argued that the numerous items listed in the proposed 40 CFR §60.4861(a) and 40 CFR §60.5181(a) for determining whether excess emissions during a malfunction should be considered a violation should not be listed as mandatory criteria, all of which have to be met in order for an exceedance to be excused. For example, the commenter (91.1) stated that the proposed section 60.4861(a)(1)(i) states that the excess emissions must have been "caused by a sudden, short, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner"; however, there is no practical reason why a sudden, infrequent, and unavoidable equipment failure should be exempted if it was "short" but considered a violation if it was not "short". Similarly, the commenter (91.1) asked why a malfunction should be considered a violation of the standards if it is not "infrequent," even though it is "not part of a recurring pattern indicative of inadequate design, operation, or maintenance" (see proposed section 60.4861(a)(1)(iv)).

Response: EPA is revising the affirmative defense language to delete "short" from 60.4861.(a)(1)(i), because other criteria in the affirmative defense require that the source assure that the duration of the excess emissions "were minimized to the maximum extent practicable." EPA disagrees with the commenter that suggests that it need not satisfy all of the requirements of the affirmative defense. As noted above, the requirements set forth in the affirmative defense provision are modeled after the conditions of the affirmative defense in EPA's SIP SSM policy. Finally, EPA is not eliminating the word "infrequent" from 40 CFR §60.4861(a)(1)(i), because that term appears in the definition of malfunction in 60.2.

Comment: Two commenters (97.1, 127.1, 95.1) are concerned with the proposed requirement to prepare a written root cause analysis. The commenter (97.1, 127.1) stated that the requirement to prepare a written root cause analysis "to determine, correct, and eliminate the primary causes of the malfunction" is unreasonably stringent and would result in some categories of malfunctions potentially never satisfying the proposed affirmative defense. The commenter (97.1, 127.1) provided an example such that the only method a source has to "correct and eliminate" a malfunction caused by a power failure from the grid is to install redundant power generating facilities. The commenter (97.1, 127.1) stated that the technological and economic impacts of "super engineering" facilities in the way envisioned by EPA are unreasonable and

disconnected from the authority EPA has to set standards under the CAA. The commenter (95.1) added that for most malfunctions, the cause is immediately obvious; and there is no need to go into a detailed root cause analysis to determine the cause. The commenter (95.1) also stated that it is impossible to eliminate the causes for certain malfunctions (e.g., lightning strikes). The commenter (95.1) argued that the proposed language assumes that all malfunctions are equally significant and need an identical degree of investigation. The commenter (95.1) stated that a root cause analysis should only be-used as a last resort when other reasonable methods fail to show what caused the malfunction or when the serious nature of an event might make such an analysis necessary. The commenter (95.1) stated the facility needs to have some discretion in making that determination. The commenter (95.1) is also concerned that 30 days may not be enough time to complete a root cause analysis and recommended that EPA allow 90 days to complete the report. The commenter also recommended that EPA allow notification by e-mail or other electronic forms to submit the root cause analysis as faxing is an obsolete technology. The commenter (95.1) suggested several modifications to the regulatory language.

Response: EPA is revising this requirement to clarify that the purpose of the root cause analysis is to determine, correct, and eliminate the primary cause of the malfunction. The root cause analysis itself does not necessarily require that the cause be determined, corrected or eliminated. However, in most cases, EPA believes that a properly conducted root cause analysis will have such results. EPA does not assume that all malfunctions require an identical degree of investigation. A root cause analysis need not be more detailed than is called for given the nature of the malfunction. In addition, as discussed below EPA is revising the 30 day requirement for a written report to the Administrator.

When a malfunction occurs, sources must report them according to the applicable reporting requirements of the Subpart. An affirmative defense to civil penalties for exceedances of emission limits that are caused by malfunctions is available to a source if it can demonstrate that certain criteria and requirements are satisfied. The criteria ensure that the affirmative defense is available only where the event that causes an exceedance of the emission limit meets the definition of malfunction in 40 C.F.R. 63.2 (sudden, infrequent, not reasonably preventable and not caused by poor maintenance and or careless operation) and where the source took all appropriate actions to minimize emissions. In addition, the source must meet certain notification, recordkeeping and reporting requirements. For example, as discussed previously, the source must prepare a written root cause analysis and submit a written report to the

Administrator documenting that it has met the conditions and requirements for assertion of the affirmative defense.

In response to this comment, EPA has provided an administrative adjustment to the ICR for this standard that shows what the notification, recordkeeping and reporting requirements associated with the assertion of the affirmative defense might entail. EPA's estimate for the required notification, reports and records, including the root cause analysis, is based on the time and effort required of a source to review relevant data, interview plant employees, and document the events surrounding a malfunction that has caused an exceedance of an emission limit. The estimate also includes time to produce and retain the records and reports for submission to EPA. EPA provides this illustrative estimate of this burden because these costs are only incurred if there has been a violation and a source chooses to take advantage of the affirmative defense.

If a source is in compliance and does not encounter malfunctions that cause a violation of the standard, EPA does not expect this activity to be routinely performed by a source. The decision to meet the notification, reporting and recordkeeping requirements rests with the source, who must weigh the cost of meeting the requirements against their perceived need to prepare an affirmative defense. These requirements are also similar in nature to the SSM reporting and recordkeeping requirements that sources were previously subject to and require records and reports of the type that many sources would already keep in order to demonstrate compliance with the general duty to minimize emissions.

Comment: One commenter (91.1) stated that the language "if at all possible" in 40 CFR 60.4861(a)(6) is an extreme term that bears no relation to good air pollution control practices, and argued that this provision, as well as proposed sections 60.4861(a)(1)(ii) and (iv), should be qualified, as EPA has qualified similar provisions in the NESHAP General Provisions in 40 CFR §63.6. The commenter (91.1) recommended that these conditions be qualified with caveats that the operation must be consistent with safety and good air pollution control practices, that it does not require the source to make further efforts to reduce emissions below what the standards require, and that it does not require regular operation of backup or standby pollution control equipment. The commenter (91.1) stated that EPA has long recognized, in the General Provisions applicable to NSPS, that it is appropriate to require sources to operate the affected facility and related air pollution control technology "to the extent practicable...consistent with good air pollution control practice for minimizing emissions" during SSM periods, not "if at all possible" (See 40 CFR § 60.11(d)). The commenter (91.1) contended that EPA cannot abandon

those rational approaches and adopt the kind of absolute requirements implied by the Proposed Rule, without an explanation of why it is necessary and appropriate to do so.

Response: As noted above, many of the conditions were modeled after the conditions of the affirmative defense in EPA's SIP SSM policy, which several states have adopted into their SIPs. We do not have any indication that parties to enforcement proceedings have had any significant difficulties applying the terms of these SIP affirmative defenses. (See, e.g., State Implementation Plans: Policy Regarding Excessive Emissions During Malfunctions, Startup, and Shutdown (Sept. 20, 1999); Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions (Feb. 15, 1983)). Other conditions were modeled after a Federal Implementation promulgated by EPA. ((40 C.F.R. 50.1312). EPA's view is that use of consistent terms in establishing affirmative defense regulations and policies across various CAA programs will promote consistent implementation of those rules and policies. However, EPA agrees that some of the terms or phrases in the regulatory text establishing the affirmative can be revised or streamlined. For example, as discussed above, EPA is revising the affirmative defense language to delete "short" from 60.4861.(a)(1)(i) because other criteria in the affirmative defense require that the duration of the excess emissions "were minimized to the maximum extent practicable." In addition, EPA is revising 60.4861(a)(6) to add "consistent with good air pollution control practice for minimizing emissions" as recommended by the commenter. We are also deleting the term "severe" in the phrase "severe personal injury" in 60.4861(a)(4) because we do not think it is appropriate to make the affirmative defense available only when bypass was unavoidable to prevent severe personal injury. EPA disagrees that other terms and conditions in 60.4861(a)(4) or in the other conditions of the affirmative defense are overly subjective or extreme or need further qualification. EPA acknowledges that some of the criteria may overlap to some extent and under some circumstances (e.g., such as 60.4861(a)(6) and (a)(2) as pointed out by commenters), but does not believe it is necessary to change the requirements. To the extent there is overlap, the same information can be used to meet the provisions in question.

Comment: One commenter (91.1) is concerned that the proposed section 60.4861(a)(4) would preclude a facility from taking advantage of the affirmative defense if the malfunction involved bypassing control equipment or a process and the bypass was not "unavoidable to prevent loss of life, severe personal injury, or severe property damage". The commenter (91.1) is concerned that this language is stated in such extreme terms that it may be difficult or

impossible to meet this criterion, even though bypassing the control equipment or the process was an appropriate exercise of good air pollution control practices. For example, the commenter (91.1) stated that a bypass can be the appropriate response to an upset in order to prevent excess emissions, e.g., fouling of pollution control equipment media that in turn would result in reduced pollution control equipment efficiency or increased pollution control equipment downtime. The commenter (91.1) stated that there can be substantial room for disagreement about what constitutes "severe" property damage. The commenter (91.1) asked what degree of injury to employees must the bypass avoid in order to qualify as avoiding "severe" personal injury. The commenter (91.1) stated that besides the unclear and subjective nature of these criteria, there is nothing inherent to standards under CAA sections 111 and 129 that require a source to avoid bypassing control equipment to such a degree. The commenter (91.1) said that it is not apparent at all why the CAA would disfavor bypassing "a process" in this way.

Response: See above response.

Comment: One commenter (91.1) stated that the language "all possible steps" in proposed section 60.4861(a)(6), is a subjective term, and presents a disconnect between the absolute and extreme requirement of the affirmative defense and the provisions of the CAA designed to attain ambient air quality standards and protect human health and the environment. The commenter (91.1) said that the CAA does not require sources to take "all possible steps" to control emissions, even to minimize the impact of hazardous air pollutant emissions on human health under CAA section 112(f). The commenter (91.1) also stated that it is unclear how this criterion for qualifying for the affirmative defense differs from proposed section 60.4861(a)(2), which requires that the frequency, amount, and duration of excess emissions "were minimized to the maximum extent practicable". The commenter (91.1) contended that unless EPA explains what additional showing would be needed by section 60.4861(a)(6), it should be eliminated.

Response: See above response.

Comment: One commenter (91.1) is concerned about the requirement proposed in section 60.4861(a)(8) such that the language that says a source must show that "at all times, the facility was operated in a manner consistent with good practices for minimizing emissions", could be read to go way beyond an analysis of why equipment may have malfunctioned and place an insurmountable burden on the source to meet a "good practices" standard (undefined) for the whole sewage treatment plant, industrial plant, or commercial premises. The commenter (91.1) stated that the problem is that EPA has used "facility" in some aspects of the Proposed

Rule to indicate something much larger than the SSI unit subject to the Proposed Standards (See proposed 40 CFR §60.4780). The commenter (91.1) contended that this factor could allow a regulatory enforcement official to potentially measure the entirety of operations at a site against a multitude of arbitrary "good practices" and subjectively find the source lacking, thereby denying the source the ability to assert an affirmative defense. The commenter (91.1) recommended that if EPA retains this condition for the affirmative defense, of demonstrating operation consistent with good practices for minimizing emissions, EPA must clarify that this condition applies to the "affected facility" or "existing facility," as those terms are defined in 40 CFR §60.2. Furthermore, the commenter (91.1) stated that if EPA really does intend for this condition to apply to operation of the entire site, and not just the SSI unit, then EPA must justify why EPA has the statutory authority to shift its focus from the SSI unit to the plant as a whole.

Response: We have revised section 60.4861(a)(8) and 60.5181(a)(8) to refer to the "affected facility," which is defined in section 60.4930 and 60.5250.

Comment: One commenter (91.1) is concerned about the requirement proposed in section 60.4861(a)(9) such that the language that reads "have prepared a written root cause analysis to determine, correct, and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue" does not implement the statutory criteria for standard-setting under sections 111 and 129. The commenter (91.1) said that if read literally, it would mean that a source could never take advantage of the affirmative defense if the source was unable to determine the primary cause of the malfunction or was unable to correct that cause. The commenter (91.1) asserted that EPA has defined a malfunction as an event that is "unavoidable" and unforeseeable (see proposed section 60.4861(a)(1)(i)-(iii)); therefore, it should be expected that in many cases the primary cause of the malfunction will not be ascertainable, or it will not be possible to identify a way to ensure the malfunction will not recur. The commenter (91.1) stated that EPA has long acknowledged this reality in the General Provisions applicable to NSPS, which requires that written reports of excess emissions include the "nature and cause of any malfunction, if known...." (see 40 CFR §60.7(b)(2)). In addition, the commenter (91.1) stated that requiring the facility to eliminate the primary causes of the malfunction, without regard to "taking into consideration the cost of achieving such" elimination and the "non-air quality health and environmental impacts and energy requirements" associated with its elimination is unreasonable and entirely inconsistent with the criteria for standards established under CAA sections 111(a)(1) and 129(a)(2).

Response: EPA is revising this requirement to clarify that the purpose of the root cause analysis is to determine, correct, and eliminate the primary cause of the malfunction and that the root cause analysis itself does not necessarily require that the cause be determined, corrected or eliminated. However, in most cases, EPA believes that a properly conducted root cause analysis will have such results.

Comment: One commenter (91.1) said the requirement in proposed section 60.4861(b) to notify the Administrator by telephone or fax as soon as possible, but no later than two business days after the malfunction begins, and then to submit a written report within 30 days of the initial occurrence of the malfunction that demonstrates, "with all necessary supporting documentation," that the source met all of the multitude of criteria for the affirmative defense, is unreasonable and unnecessary. The commenter (91.1) stated that it is novel at best for a person to be determined to have acted unlawfully unless the person has submitted his entire defense before he is even notified of a potential enforcement action. The commenter (91.1) stated that in many cases, it would be obvious to the enforcement authority (not "the Administrator"), based on the kind of short malfunction or deviation report that sources already submit under many air programs, that an exceedance of the Proposed Standards resulted from an unforeseen and unavoidable equipment failure or process upset. The commenter (91.1) contended that it is extremely inefficient and burdensome for both sources and regulators to require a complete justification of the affirmative defense before the enforcement authority has indicated any need for further investigation. Additionally, the commenter (91.1) stated that allowing only 30 days to provide the kind of extensive documentation required by the affirmative defense as currently written, including a completed root cause analysis, is unreasonable. The commenter (91.1) recommended ninety days as the minimum time that should be allowed, unless EPA substantially streamlines the criteria for the affirmative defense.

Response: The requirement to notify the Administrator of an exceedance during a malfunction is reasonable and consistent with many other upset and malfunction notification requirements that have been applied without significant difficulty. (See, e.g. 40 CFR 63.6(e)(3)(iv)). EPA is revising 60.4861(b) to state that a written report must be submitted within 45 days of the initial occurrence of the malfunction. We further revised this provision to allow the source to seek an extension of up to an additional 30 days.

15.6 Startup and Shutdown in Affirmative Defense

Comment: One commenter (91.1) stated that EPA's rationale for excluding startup and shutdown events from the proposed affirmative defense is unclear. The commenter (91.1) argued that if EPA persists in its proposal not to provide separate emission limitations for startup and shutdown of the SSI units, and if in fact excess emissions from an SSI unit cannot reasonably be avoided during a startup or shutdown, not because of failure of a process or equipment but because of the nature of conditions while starting up or shutting down the source, there is no apparent reason why EPA would not provide the same kind of affirmative defense that it proposes to provide for malfunctions.

Response: EPA is promulgating the affirmative defense for malfunctions only, not for periods of startup and shutdown. As explained earlier in this preamble, EPA believes that malfunction events should be treated differently than periods of startup and shutdown, which are predictable and routine aspects of a source's operations. In contrast, EPA does not view malfunctions as a distinct operating mode. Because startup and shutdown periods are part of a source's normal operations, the same approach to compliance with, and enforcement of, applicable emissions standards during those periods should apply as otherwise applies during a source's operations. Further, as explained above, periods of startup and shutdown – but not malfunctions -- are taken into account when establishing section 129 emissions standards. For these reasons, EPA does not believe it is appropriate to apply the affirmative defense provision to startup and shutdown periods.

15.7 Application of Affirmative Defense

Comment: Many commenters (84.1, 119.1, 91.1) argued that EPA's affirmative defense for violating emission standards during startup, shutdown, and malfunction events is unlawful. The commenter (AA-8) argued that the affirmative defense that EPA proposes to allow in case of malfunctions is impermissible and goes directly against congressional intent by attempting to eliminate, via regulations, civil penalties in cases of malfunction where the violator demonstrates that nine factors are obtained. The commenter (84.1, 119.1) stated that the affirmative defense runs counter to two clearly expressed intents of Congress: (1) the burden it places on citizen groups makes it less likely that citizens will enforce the Act, see, e.g., Delaware Valley Citizens' Council, 478 U.S. at 560; and (2) several of the factors at issue in the affirmative defense undercuts Congress's intent that citizen suit enforcement should avoid re-delving into "technological or other considerations," *NRDC v. Train*, 510 F.2d at 700. The commenter (84.1,

119.1) pointed out that EPA's regulation would mean that if Sierra Club sued a cement kiln for its violation of the NESHAP for mercury, the kiln owner would be exempt from paying civil penalties so long as the kiln owner satisfied the requirements set forth in EPA's regulations. See Cement Kilns Rule, 75 Fed. Reg. at 55,053-54 (to be codified at 40 CFR § 63.1344). The commenter (84.1, 119.1) stated that the affirmative defense would likely be used on a routine basis by polluters seeking to avoid penalties, just as the malfunction exemption was; and as a result, citizens who seek civil penalties against polluters in order to better achieve the Act's goals will be forced to engage in fact-intensive disputes over the cause of emission violations and adequacy of responsive measures – an outcome Congress intended to prevent with the simple straightforward enforcement and penalty provisions in the Clean Air Act. Another commenter (PC-427, 91.1) stated that the affirmative defense EPA describes in the Proposed Rule are unreasonable and impracticable, and inappropriately shifts the burden to the source to disprove alleged violations during malfunctions. Two commenters (91.1, 95.1) argued that the affirmative defense places the source in the position of proving its innocence, rather than EPA or another enforcement authority having to prove that the source violated the CAA. The commenter (95.1) said the burden of proof should be on the Agency not the facility. The commenter (91.1) stated that being able to assert a defense obviously is not the same as complying with emission limitations that are properly set in accordance with sections 111 and 129. Two commenters (91.1, 97.1, 127.1) stated that it is unclear where EPA finds the legal authority in the CAA to shift the burden to the regulated community of proving (or disproving) essential elements of an alleged violation. The commenters (91.1, 97.1, 127.1) declared that the statute is silent as to the issue and the ordinary default rule [is] that plaintiffs bear the risk of failing to prove their claims citing Shaeffer v. Weast, 546 U.S. 49 (2005), and quoting: McCormick on Evidence §337, at 412 ["The burdens of pleading and proof with regard to most facts have and should be assigned to the plaintiff who generally seeks to change the present state of affairs and who therefore naturally should be expected to bear the risk of failure or proof or persuasion"]; C. Mueller & L. Kirkpatrick, Evidence § 3.1, p. 104 (3d ed. 2003) ["Perhaps the broadest and most accepted idea is that the person who seeks court action should justify the request, which means that the plaintiffs bear the burdens on the elements in their claims"]. The commenters (91.1, 97.1, 127.1) stated that while the Supreme Court has recognized exceptions such as affirmative defenses, courts retain the authority to establish such rules unless Congress acts to delegate that authority; and argued in this instance, that EPA has not provided any justification for requiring a source to

prove its innocence; in fact, to fully demonstrate its innocence within 30 days of the event, without even being charged. The commenter (91.1) argued that if EPA adopts an approach along the lines of the proposed affirmative defense, it should be stated instead in terms that, once a source has claimed that its excess emissions were related to a malfunction, it will not be considered to be in violation of the standards unless the enforcement authority demonstrates that the source is not entitled to claim the malfunction.

Response: EPA recognizes the competing concerns of the commenters. On the one hand, citizen enforcers are concerned about additional complications in their enforcement actions against alleged violators. On the other hand, industrial sources are concerned about being penalized for violations caused by malfunctions that could not have prevented and were otherwise appropriately handled (as reflected in the affirmative defense criteria). EPA has utilized its Section 301(a)(1) authority to issue regulations necessary to carry out the Act in a manner that appropriately balances these competing concerns. *See, e.g.*, *Arizona Pub. Serv. Co. v. EPA*, 562 F.3d 1116, 1120, 1129-30 (10th Cir. 2009) (rejecting industry challenge to EPA's use of an affirmative defense to address excess emissions during malfunction events.).

EPA disagrees with the commenters who alleged that the affirmative defense provision for malfunctions is inconsistent with the section 113(e) and sections 304 of the Act. Section 304 gives district courts jurisdiction "to apply appropriate civil penalties." Section 113(e)(1) identifies the factors that the Administrator or a court shall take into consideration in determining the amount of a penalty to be assessed, once it has been determined that a penalty is appropriate. The affirmative defense regulatory provision is not relevant to the amount of any penalty to be assessed. If a court determines that the affirmative defense elements have been established, then a penalty is not appropriate and penalty assessment pursuant to the section 113(e)(1) factors does not occur.

EPA also disagrees that the affirmative defense provision will hamper citizen enforcement. First, injunctive relief is still available and the threat of penalties would not deter violations in cases where all of the conditions of the affirmative defense have been satisfied. Further, litigating whether the affirmative defense is or is not available will not burden citizen groups any more or less than would litigating the appropriate penalty amount in the penalty assessment stage of a citizen suit enforcement action, because the 113(e) penalty assessment criteria and the affirmative defense criteria are similar and in fact overlap. For example, the requirement that the Administrator or the court consider "good faith efforts to comply" is bound

to generate the type of fact-intensive disputes that the commenter complains of. In addition, several of the affirmative defense criteria are exactly the type of criteria the Administrator or Court might consider in determining whether a source made "good faith efforts to comply." For example, to take advantage of the affirmative defense, the source must prove by a preponderance of the evidence that, among other things, the excess emissions "were caused by an unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner" and "could not have been prevented through careful planning, proper design or better operation and maintenance practices" and "did not stem from any activity or event that could have been foreseen and avoided, or planned for."

Thus, EPA does not expect the affirmative defense provision to significantly alter the burden of bringing a citizen enforcement action. For those cases that do proceed to trial, even in the absence of this affirmative defense, sources generally raise equitable arguments to argue for a low penalty and citizens often rebut such arguments. Therefore, as a practical matter, EPA does not expect the affirmative defense provision to materially affect the practice of Clean Air Act enforcement.

Additionally, EPA disagrees with commenters who asserted that the affirmative defense is not a reasonable interpretation of the statute. EPA's judgment is that the affirmative defense criteria capture the appropriate considerations in determining whether penalties are appropriate when a violation occurs as the result of a malfunction. As noted above, the affirmative defense criteria overlap to some extent with the penalty assessment criteria set forth in section 113(e), but are not identical. For example, size of business is one of the factors listed in section 113(e), but is not reflected in EPA's affirmative defense. This reflects EPA's view that when a violation is caused by a malfunction, the size of the business is not relevant to whether penalties should be excused. If the violation was unavoidable and could not have been prevented, EPA's view is that it would be unfair to impose a penalty no matter the size of the business.

EPA also disagrees that the affirmative defense provision inappropriately shifts the burden of proving or disproving the elements of a violation to the regulated source. The affirmative defense does not change the burden of proof with respect to establishing a violation. The burden of proof remains with the plaintiff in an enforcement action. The affirmative defense is relevant only after a violation has been established.

With respect to the comment that the affirmative defense "should be stated instead in terms that, once a source has claimed that its excess emissions were related to a malfunction, it

will not be considered to be in violation of the standards unless the enforcement authority demonstrates that the source is not entitled to claim the malfunction," EPA's does not agree that the affirmative defense should operate as the commenter suggests. The commenter improperly seeks to shift the burden of proof from the source to EPA. It is the source, not EPA, that has the information relevant to assess whether a particular event qualifies as a malfunction and meets the affirmative defense. Furthermore, commenter's suggested approach appears to be similar to the scheme that the court vacated in the *Sierra Club* case, in that there would be no violation unless the enforcing party (EPA or a citizen), established that the event in question was not a malfunction.

Comment: One commenter (91.1) stated that it is not clear what the affirmative defense covers. In the Proposed Rule, EPA states that the affirmative defense is "to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined in section 60.2." The commenter (91.1) asked whether the term "civil penalties," which is not defined in the Proposed Rule, is intended to apply as well to a "civil administrative penalty" imposed by EPA under CAA section 113(d) (the term "civil penalty" in other contexts means only penalties imposed by a court). The commenter (91.1) also asked whether the affirmative defense apply to "noncompliance penalties" under CAA section 120 (which apply, inter alia, to noncompliance with a section 111 NSPS). The commenter (91.1) stated that to meet the purported purpose of the affirmative defense, which is to provide relief from emission limitations that cannot be met at times even with equipment that is properly designed and maintained (see 75 Fed. Reg. 63,283 col. 2), the affirmative defense would need to apply to civil and administrative penalties, including noncompliance penalties.

Response: The affirmative defense applies to civil penalties, including civil administrative penalties and penalties under section 120, but does not apply to injunctive relief.

Comment: One commenter (91.1) stated that the reference in 40 CFR 60.4861 (noting that nearly identical language is also included in proposed Subpart MMMM) to the definition of "malfunction" in section 60.2 is confusing, and its purpose is unclear, given that the proposed SSI standards themselves contain a definition of "malfunction" (see proposed 40 CFR 60.4930). The commenter (91.1) argued that the definition in itself is unclear, since it states that: "During periods of malfunction the operator shall operate within established emissions and operating limits and shall continue monitoring of all applicable operating parameters until all waste has been combusted or until the malfunction ceases, whichever comes first." The commenter (91.1)

stated that this language, indicating that an event can only be a malfunction if the source operates within its normal emission limitations, is circular and nonsensical and must be removed.

Response: We have revised the definition of malfunction in 60.4930 to be the same as the definition of malfunction in 60.2. We made similar changes to the Emission Guidelines.

Comment: One commenter (91.1) stated that it is unclear how the affirmative defense would apply to enforcement actions by state and local governments, or to private citizen enforcement actions under CAA section 304. The commenter (91.1) stated that the preamble to the Proposed Rule, for example, speaks only in terms of application of the affirmative defense in an EPA enforcement action (See, e.g., 75 Fed. Reg. at 63,283 co. 2). The commenter (91.1) recommended that an affirmative defense should clearly state that it is applicable to enforcement actions by states or citizen-suit plaintiffs, as well.

Response: The affirmative defense is available in any action to enforce the standards set forth in this rule, whether such action is brought by EPA, a state or local authority or a citizen. Although the preamble's reference to the "Administrator" may have caused some confusion, there is nothing in the language of the regulatory text establishing the affirmative defense that suggests that the affirmative defense is limited to EPA enforcement actions.

Comment: One commenter (91.1) pointed out that the preamble to the Proposed Rule does not give any explanation for why the affirmative defense would not apply to injunctive relief. The commenter (91.1) added that if in fact the excess emissions associated with the equipment or process failure are not reasonably preventable, then there is no apparent reason why injunctive relief should be available either. The commenter (91.1) stated, as a matter of law, injunctive relief may not be available in cases where a civil penalty cannot be imposed (See Sierra Club v. Otter Tail Power Co., 615 F.3d 1008 (8th Cir. 2010)); under concurrent remedy doctrine, injunctive relief for a CAA violation is barred when civil penalty is barred by statute of limitations. The commenter (91.1) argued that maintaining liability for injunctive relief renders the affirmative defense particularly ineffective with respect to citizen suits. The commenter (91.1) stated that if the source is even potentially subject to injunctive relief, and therefore could be required to pay the citizen¬plaintiff's attorneys fees even if the source successfully demonstrated that it otherwise qualified for the affirmative defense, then the affirmative defense would not accomplish EPA's stated objective of providing relief in situations where the emission limitations cannot be met despite proper design and operation of process and control equipment. Moreover, the commenter (91.1) contended that EPA has provided no analysis that would

supersede its previous and long-standing determination that it is not desirable to rely on enforcement, rather than regulatory language, to address the inability to comply with section 111 performance standards during SSM events (referenced 37 Fed. Reg. 17,214, 17,214 (Aug. 25, 1972). See also Marathon Oil Co. v. EPA, 564 F.2d at 1273). The commenter (91.1) recommended EPA, at a minimum, state that the affirmative defense applies to civil penalties, civil administrative penalties, noncompliance penalties, and injunctive relief. The commenter (91.1) also recommended that EPA reword the "affirmative defense," so that it states that a source "will not be deemed in violation of" the Part LLLL or Part MMMM standards for excess emissions unless the event, and the source's response to the event, do not meet the criteria spelled out in the regulations (referenced Cf. 40 CFR §80.613); configured in that way, this provision for malfunction should be called something other than an "affirmative defense," such as an "alternative standard for SSM events". The commenter (91.1) stated that if EPA refuses to set alternative emission standards that apply during SSM periods and continues to rely instead on the proposed affirmative defense, the affirmative defense must be substantially modified for it to provide any significant relief. The commenter (91.1) stated that the affirmative defense needs to state clearly that a source that qualifies for the affirmative defense shall not be deemed to have violated the applicable standards during that time; if EPA does that, it may be unnecessary to state also that the affirmative defense relieves the source from liability for all types of penalties and injunctive relief (save criminal penalties), but that should be the clear effect of qualifying for the affirmative defense.

Response: EPA agrees that in some cases, injunctive relief may not be appropriate if all the criteria of the affirmative defense have been satisfied. In such cases, liability for attorney's fees is not a real issue. However, some form of injunctive relief may be appropriate. The *Sierra Club v. Otter Tail Power C.o* case cited by commenters is not on point and does not undermine EPA's ability to limit the affirmative defense to penalty claims. The concurrent remedy doctrine provides that where a party's legal remedies are time-barred a party's concurrent equitable claims generally are barred. The affirmative defense is not a time-bar to civil penalties.

EPA does not agree with commenters that the affirmative defense should operate such that if the criteria are met, there is no violation and thus should be re-labeled as an alternative standard for malfunction periods. For the reasons discussed in the preamble and elsewhere is this response to comment document, EPA is not setting alternative standards for malfunctions. The federal register notice cited by commenters is almost four decades old and does not reflect

subsequent amendments to the Clean Air Act and court decisions. In any event, the federal register notice merely states EPA's preference at that time for adopting regulations in order to formalize an approach to excess emissions caused by malfunctions. EPA explained its view that such an approach was preferable to an informal enforcement discretion approach for the following reasons: "First, the existence of a formal process better informs the public of the policy and factual issues which will underlie enforcement of the standards. Second, affected industries which are making good-faith efforts to meet the standards will on the whole welcome a regularized means of informing the Agency in detail of the circumstances surrounding unavoidable emission excesses. Third, the Agency expects to benefit substantially from the information it will gain about the operation of the processes in question, for both future enforcement and standard setting." 37 Fed. Reg. 17,214, 17,214-15 (Aug. 25, 1972).

The affirmative defense is not an informal enforcement discretion approach of the type that EPA rejected in 1972 and provides the benefits associated with the formalized approach that EPA identified in its 1972 proposal. The Marathon Oil decision cited by commenters interprets provisions of the Clean Water Act that are different in nature than provisions governing standards under section 129 of the Clean Air Act. However, Marathon Oil merely rejected an informal enforcement discretion approach and suggested that EPA's approach be formalized. (Marathon Oil Co. v. EPA, 564 F.2d at 1273). In fact, the affirmative defense comports with the court's suggestion in Marathon Oil that EPA "place the burden on the permit holder of producing the relevant data and proving that the upset could not have been prevented." Id.

15.8 Operating Modes

Comment: One commenter (91.1) argued that EPA provides no explanation of how it determined that malfunctions are not a distinct operating mode; and EPA offers no explanation of how it determined that, even though it believes malfunctions are not a distinct operating mode, emissions during malfunctions should not be used to characterize the source's operating mode. The commenter (91.1) agreed with EPA's conclusion that the factual complexity of differing processes and of the severity, frequency, and duration of malfunctions makes standard-setting difficult. The commenter (91.1) stated that it is often impossible to gather emission data during malfunctions (either for standard-setting or for compliance demonstration purposes). The commenter (91.1) stated that malfunctions are by definition unexpected, so it is not possible to plan to have test equipment in place to measure emissions when one occurs; and even if test or

monitoring equipment is in place, emissions during malfunctions often are not routed to a stack where they can be measured, and upsets during stack testing invalidate the test results under EPA‘s approved test methods. Another commenter (97.1, 127.1) disagreed with EPA’s newly articulated view that malfunctions are not distinct operating conditions from steady-state operations. The commenter (97.1, 127.1) stated that SSI operators must treat malfunctions as very distinct events from steady-state operations, depending on the severity of the malfunction requiring anything from shutdown of the unit to emergency fire response actions. The commenter (97.1, 127.1) stated that depending on the nature and severity of the malfunction event, emissions often are not capable of being captured and routed to a stack for control and/or measurement and, when they are, test methods do not adequately account for the often short-term and unstable characteristics of the malfunction event.

One commenter (76.1) does not agree that 129 standards should apply during a scheduled startup, shutdown, or break down. However, the commenter (76.1) agreed with EPA that a malfunction is not a distinct operating mode and that 129 standards should apply during a malfunction. The commenter (76.1) stated that this is consistent with the local Bay Area Air Quality Management District (BAAQMD) enforcement policy such that if a malfunction was unforeseen and not caused by a negligent act, BAAQMD has a procedure in place to grant relief from the emission limit, called "Breakdown Relief". The commenter (76.1) said that instances of break down are rare and usually include an inspection from local regulators, thus making the break down relief designation a verifiable non-negligent designation for a true failure. The commenter (76.1) recommended EPA grant relief for startup, shutdown, and breakdown because even the best run plants have unforeseen conditions and "Acts of God" that create a need for break down relief.

Response: EPA’s rationale for its treatment of malfunctions is explained in the preamble and elsewhere in this response to comment document. For the reasons described in the above responses, EPA’s approach to malfunctions is consistent with section 129 and is a reasonable interpretation of the statute. EPA does not disagree with commenters statements concerning how operators react to malfunctions or the issues associated with treatment or control of emissions associated with malfunctions. EPA has structured the affirmative defense to take into account these issues and to provide relief from civil penalties where appropriate.

Comment: Some commenters (118.1, 122, 123) stated that the definitions in the proposed rule for startup and shutdown seem to be somewhat confusing and potentially

burdensome, and could result in significant undue wear and maintenance on equipment. The commenters (118.1, 122, 123) stated that in a MH SSI system, when sludge is not being fed to the incinerator for reasons such as preventative maintenance or simply lack of sludge, the best procedure or condition for "coasting" the incinerator during those periods of time is to reduce the temperatures in the incinerator to a level lower than temperatures during actual combustion, and to cease the flow of air through the pollution control equipment (this is considered "warm stand-by"). The commenters (118.1, 122, 123) said that continuing to keep the hearths warm, and in particular the refractory, prevents the contraction and expansion of these components during a cold startup and a total shutdown that would include the constant cessation and commencement of burner firing. The commenters (118.1, 122, 123) contended that all MH manufacturers' will confirm that the "warm stand-by" mode enhances and lengthens the life of the incinerator and reduces costly maintenance and downtime. The commenters (118.1, 122, 123) stated that the definition of startup infers that the burners are off, and that as soon as the burners are turned on, all pollution control equipment must already be operational; and argued that this is contradictory and confusing in that the definition of shutdown does not include the de-activation of the burners (therefore, the indication is that once the sludge has been combusted, we have shutdown and should no longer be required to monitor). The commenters (118.1, 122, 123) noted that EPA's definition of shutdown does not suggest that it is necessary to de-activate the auxiliary fuel burners; and stated that since the major concern of the emission guidelines is the removal of pollutants from the exhaust gases caused by the combustion of sludge, this definition appears sufficient and appropriate, and the monitoring and averaging of emissions and operational data should stop once the sludge is no longer being charged to the incinerator. The commenters (118.1, 122, 123) recommended to not include the activation of the burners in the definition of startup, but rather to use a definition that defines startup as that period of time when sludge is first charged to the incinerator.

Response: In the proposed and final rules we have required that emission limits apply at all times, including startup and shutdown. Shutdown has been defined as the period of time after all sewage sludge has been combusted in the primary chamber. Startup means the period of time between the activation, including the firing of fuels (e.g., natural gas or distillate oil), of the system and the first sewage sludge feed to the unit. We maintain these are appropriate, and neither definition prevents operators from running SSI units on “warm stand-by” mode.

16.0 DELEGATION OF AUTHORITY

Comment: In regards to proposed §60.5045 (the provision that would allow states to request delegation of the Federal Plan), the commenter (55) stated that they generally prefer for the state (not EPA) to be the implementing agency for federal standards. The commenter (55) stated that they often have only one or two existing facilities that are subject to Emission Guidelines promulgated by EPA; and provided examples of affected facilities that closed because of certain Emission Guidelines that were adopted via a state plan (approved by EPA). The commenter (55) stated that if proposed rule §60.5045 is promulgated, they will have the option of requesting delegation of the federal plan eliminating the time consuming path of adopting rules and preparing a state plan, yet still allowing states the implementing authority.

Response: The commenter is correct that EPA will develop a federal plan the states can use.

17.0 STATE PLANS

Comment: One commenter (57, 597) stated that they operate two multiple hearth incinerators that have a CO concentration permit limit imposed by New Jersey Department of Environmental Protection (NJDEP) of 100 ppm @ 7% O_2 based on a rolling one hour limit. The commenter (57, 597) is concerned that the proposed emission limit of 3,900 ppmvd @ 7% O_2 is less stringent than the existing NJDEP imposed limit and it would be considered "antibacksliding".

Response: State and local regulatory agencies may have stricter emission limits based on state and local needs. The final emission standards are based on emissions information gathered from facilities located in a mix of northern, southern, eastern, and western states, and represent the emissions achievable by the best-performing of these facilities on a national level.

18.0 IMPACTS ANALYSIS (EXCLUDING SMALL BUSINESS AND LANDFILLLING IMPACTS)

18.1 Total Cost is Incorrect

Comment: Several commenters (61.1, 83.1, 96.1) stated that EPA overstated the benefits of the proposed standards or that the cost, cost-benefit, and operational impacts were flawed. Many commenters (61.1, 83.1, 89.1, 90.1, 113.1, 132.1, 136.1) stated that EPA underestimated the emission control costs and overestimated the baseline emissions from existing SSIs. Some commenters (61.1, 83.1) stated that EPA understated the compliance costs; specifically, commenters (83.1, 138) stated that the $225 million capital cost estimate provided by EPA was too low, and one commenter (83.1) provided an estimate of $8-10 million (capital cost) for an individual facility. The commenter (83.1) noted that due to costs, the estimated benefit makes implementation of the new rules unreasonable. Other commenters (83.1, 102.1, 116.1) stated the belief that EPA is basing the rule on faulty data and/or improper assumptions and stated that the emission calculations are off by an order of magnitude; these commenters requested that EPA reissue the cost-benefit analysis. One commenter (48.1) contended that the cost estimate for response to the regulation could not be correct. The commenter cited the estimated cost that would be incurred at their facility in comparison to the total estimated cost. Another commenter (134.1) provided their own estimate of the total cost for all incineration facilities to comply. The commenter (134.1) stated that the total capital cost provided, $2.6 billion, accounts for the addition of caustic to existing wet scrubbers, a wet electrostatic precipitator for fine particulate removal, a heat recovery device to increase the flue gas temperature above the dew point, and an increase in the size of the ID fan.

Response: EPA has re-evaluated the control options for SSI units and has incorporated data corrections and methodology revisions into revised cost analyses. Please see the preamble to the final SSI rule, and the memoranda "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology", "Revised Cost and Emission Reduction of the MACT Floor Level of Control", and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for further discussion regarding the revised cost estimates and control considerations.

Comment: A commenter (48.1) stated that the cost of compliance for the 112 facilities was stated as $105 million, but that there was no time value associated with the cost. The

commenter added that at a minimum a cost estimate should have a clear and consistent accounting of the number of facilities to which costs would be incurred.

Response: Both capital and annual compliance costs were estimated and the $105 million was the annual cost, in dollars per year, estimated for facilities to comply with the proposed standards. EPA has re-evaluated the control options for SSI units and has incorporated data corrections and methodology revisions into revised cost analyses. The annual cost for compliance with the revised standards is approximately $17.8 million/yr. The cost estimates account for costs expected to be incurred for each unit to comply with the proposed standards. Please see the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" (EPA-HQ-OAR-2009-0559) for further discussion regarding the revised cost estimates and control considerations. The tables associated with this memo list cost details for all facilities in the known SSI inventory.

18.2 Compliance Assumptions are not Representative of Current Facilities

Comment: Some commenters (71.1, 138) stated that EPA used assumptions and other factors from other rules for units that have no similarity to SSIs and that burn wastes that are not similar to sewage sludge in the development of the proposed rule. Commenters asserted that this has resulted in an underestimation of compliance costs and local financial impacts. One commenter (48.1) specifically stated that considering sewage sludge as a solid waste mandates that the waste be subject to the best available control technology (BACT) for solid waste; the commenter (48.1) urged the Agency to consider the compatibility of BACT used for the solid waste designation with the sewage sludge incineration processes, for which, the commenter indicates, the BACT were never intended.

Response: EPA disagrees with the commenters. Cost algorithms were modified to be applicable to SSIs. The commenter is mistaken regarding the use of BACT. Please refer to the Section 129 requirements of the CAA.

Comment: One commenter (129.1) asserted that EPA personnel have incorrectly indicated that all of the existing SSIs will meet all of the proposed emissions guidelines. The commenter (129.1) stated that the data used to determined compliance with the current regulatory emission limits is extremely old and is not reflective of the number of improvements that have been made to SSI operating systems; the commenter (129.1) stated that this makes it very difficult to determine how many existing SSIs will be impacted by the proposed emission

guidelines. The commenter (129.1) provided results for testing conducted on their multiple hearth incinerators in the mid 1990s, and remarked that the units were not in compliance with the proposed cadmium, mercury, oxides of nitrogen, lead and sulfur dioxide limits; the commenter stated that new testing would be required to determine compliance with the proposed limits.

Response: EPA disagrees with the commenter. Emissions data used to determine the MACT floor limits came from tests conducted from 2000 to 2010; most of the tests were conducted from 2009 through 2010. EPA expects that many units would be able to comply with the proposed limits, and that those who cannot would be able to meet them after installing the appropriate pollution control systems.

Comment: One commenter (134.1) stated that the proposed impacts are not representative of an 8760 hour annual operating time and fail to include variations in wastewater solids quantity and quality, normal operating variations, and variances during startup, shutdown, and malfunction.

Response: EPA notes that the proposed costs and impacts are estimates. Based on data received during the ICR process and the comment response period, many SSI facilities do not run their incinerators full time (8760 hours per year). The impacts (emission reductions, secondary impacts, and compliance costs) estimated for the standards are based on the annual operating hours provided by surveyed facilities in addition to data received during the comment periods. The development of the parameters used in the emissions and cost analyses are explained in the memorandum "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology" (EPA-HQ-OAR-2009-0559). EPA does not have any data on wastewater variability.

18.3 Cost per Pound of Pollutant is Too Low

Comment: Commenters (83.1, 76.1, 87.1) stated that because emissions were over-estimated, the cost per pound of pollutant reduced is too low. One commenter (83.1) added that this issue, in and of itself, is a sufficient basis to withdraw the Proposed Rule. One commenter (138) stated that although the proposed rule estimates the incremental cost of adding activated carbon to all multiple hearth incinerators to be six thousand dollars ($6,000) per pound removed, their own costs estimates reflect a value of one hundred thousand dollars ($100,000) per pound removed or higher. Another commenter (138) stated that EPA's cost data for mercury controls is unreasonably low at $6,000 per pound of mercury removed and a total annualized cost of

$105,000,000 for all currently operating units to comply with the proposed standards. The commenter (138) also predicted the cost of mercury removal to be one hundred twenty-five thousand dollars ($125,000) per pound of mercury removed. The commenter stated that using this cost results in an annual cost of almost four million dollars ($4,000,000) to remove thirty-one point five (31.5) pounds of mercury. The commenter also stated that the actual costs of compliance are expected to be more than twenty (20) times those estimated by the EPA. Other commenters (105.1, 118.1) stated that based on the initial calculations of one utility, additional mercury reductions from current levels could cost more than $190 million per ton. One commenter (93.1) provided a conservative estimate of a cost effectiveness of $39.6 million per ton of mercury removed.

Another commenter (76.1) stated that EPA did not provide a cost benefit analysis for the reduction in mercury. The commenter (76.1) estimated the cost for mercury reduction to beyond the MACT floor as $334,797 per pound of mercury reduced with the actual total cost for mercury reduction by all SSIs in the Unites States at $1,042,959,614. Commenters (76.1) stated that if they were accurate, it is likely that EPA costs for social benefits would drop because those costs were based on numbers that were estimated too high. The commenter (76.1) recalculated the social benefit for this regulation at $181,708,953, stating that the cost to comply is 5.73 times the estimated social benefit, making the rule unreasonable.

Additionally, one commenter (138) stated that the EPA analysis does not justify the additional mercury removal or the installation of a carbon system. The commenter (138) provided a capital cost for one carbon system for five facilities of $2.5 million per unit, which is equivalent to the cost of $57.7 million per ton removed. The commenter (138) stated that the mercury removal cost is potentially five to ten (5-10) times low. Another commenter (97.1, 127.1) stated that the average mercury removal cost for them would be more than $100,000 per pound of mercury removed. The commenter (97.1, 127.1) stated that the City of Palo Alto Regional Water Quality Control Plant conducted a similar cost analysis that put the national cost of mercury removal at nearly $190,000 per pound, and over $400,000 per pound for the City based on its actual emissions level.

Response: After revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its baseline emission estimates (see the memorandum “Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units”(EPA-HQ-OAR-2009-0559) for details). Consequently,

emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for mercury. Please see Section V, Part E of the preamble for EPA's more detailed response to these concerns.

Comment: One commenter (138) is concerned about the proposed requirement to use a beyond the MACT floor mercury concentration limit of 0.02 milligrams of mercury for the existing MH furnaces, and stated that the limit is 85% below the MACT floor mercury concentration limit. The commenter (138) suggests the below the MACT floor mercury concentration limit is far more costly than noted in the proposed rule, and is not justified by any scientific documentation provided to the public as part of the rulemaking process. One commenter (90.1) claimed that the beyond the floor limit for mercury must not be in the final rule because the cost per ton removed is not defensible given that the risk estimated by EPA due to mercury exposure is grossly overstated.

Response: After revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its baseline emission estimates (see the memorandum "Revised Estimation of Baseline Emissions from Existing Sewage Sludge Incineration Units"(EPA-HQ-OAR-2009-0559) and "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology"(EPA-HQ-OAR-2009-0559)for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for mercury. Please see Section V, Part E of the preamble for EPA's more detailed response to these concerns.

18.4 Assumed Level of Control for Metals is Too High

Comment: One commenter (145.1) stated that the 95% removal efficiency used for a combination of venturi and impingement plate scrubbers is unrealistic. The commenter stated that the EPA cost estimates assumed that all MH incinerators equipped with a combination of venturi and impingement plate scrubbers have an average Cd controlled emission rate of 0.044557 mg/dscm, which is lower than the MACT standard of 0.095 mg/dscm. The commenter noted that this was back-calculated from the assumed uncontrolled concentration of Cd with an

assumed control efficiency of 95% for a combination of venturi and impingement plate scrubber. The commenter is of the opinion that the 95% removal efficiency for a combination of a venturi and impingement plate scrubbers is too optimistic for some MH incinerators, especially those located in the industrial areas. Another commenter (145.1) questioned if technology exists for the 90% to 95% mercury removal from flue gases exiting from primary scrubbers.

Another commenter (49.1) stated that outdated venturi scrubbers were installed on multiple hearth and fluid bed incinerators in the 1960's thru early 1980's and are not effective in removing submicron particles, which are enriched with high concentrations of heavy metals. The commenter (49.1) stated that new scrubbers are needed to reduce submicron particles and metal emissions. The commenter estimated that if electrostatic precipitators or high efficiency Venturi-Pak are installed on MH incinerators, then heavy metal emissions can be reduced by 90%.

Response: The commenter did not provide data for EPA to revise its estimates. When data corrections were provided by commenters, we incorporated them into our analyses where appropriate. We have revised our analysis of MACT and beyond-the-floor control options; please see the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details.

18.5 Required Controls and Associated Costs are Inaccurate

Comment: Some commenters (68.1) stated that EPA has made blanket assumptions regarding applicability of emissions controls for all SSI installations which may not be appropriate for specific facilities. Several commenters (87.1, 74.1, 78.1, 81.1, 68.1, 69.1, 108.1, 103.1, 102.1, 116.1, 113.1, 114.1, 105.1, 112.1, 129.1) asserted that EPA has underestimated the cost of the emissions controls that will be necessary to meet the proposed standards. Commenters (87.1, 74.1, 78.1, 81.1, 68.1, 70.1, 69.1, 103.1, 102.1, 116.1, 113.1, 114.1, 115.1, 83.1, 105.1, 112.1) stated that EPA has incorrectly assumed that existing multiple hearth incinerators will only need to inject activated carbon into the exhaust system to reduce mercury and dioxin emissions. Commenters (134.1) stated that numerous facilities have reviewed past emission test results and have indicated that they would require additional emission control equipment. At least two commenters (87.1, 112.1) provided actual emissions data indicating that their WWTP incinerators would most likely not reliably meet the proposed standards for NOx, SO2, Pb, Cd and Hg. The commenters also provided data for the anticipated additional control systems that

would be required for control of SO_2, Pb, Cd, and Hg and the associated equipment costs. Commenters (121.1) stated that the emission controls to decrease pollutant concentrations to the required levels will necessitate multiple technologies, will be very costly, and still may produce discharges that are unable to meet the proposed standards.

At least six commenters (87.1, 70.1, 69.1, 102.1, 116.1, 113.1, 114.1, 83.1, 105.1, 112.1) stated that their SSIs would also need a contact chamber, fabric filter, and additional ductwork, or alternatively another emission control altogether to achieve the proposed levels of mercury emissions. One commenter (138) asserted that they would actually need to install a powdered activated carbon injection system, a fabric filter baghouse, a high efficiency condensing scrubber, and a granular activated carbon packed bed in order to meet the mercury limits. One commenter (76.1) believed that all of their MHFs would need modified afterburners, activated carbon injection systems, fabric filters, and packed bed scrubbers to control mercury to beyond-the-MACT-floor limit. One commenter (103.1) indicated that mercury control will also require a mechanism to remove the carbon without recycling back to liquids treatment (baghouse or equivalent) and some mechanism to cool the gas prior to the baghouse; the commenter provided a cost estimate of $25 million for adding this equipment to existing incinerators. Another commenter (105.1) provided estimates for construction costs of a carbon injection based system including a heat recovery system (noting that this would be necessary to cool the flue gas) and fabric filters of $21,528,000; the commenter also estimated construction costs for fixed-bed carbon adsorption with pre-conditioning system at $4,352,000. One commenter (114.1) stated that mercury controls for their facility are preliminarily estimated at a capital cost of $1-52 million. One commenter (116.1) provided an estimate of $4.8 million for a carbon adsorption system, secondary heat exchanger, fans, and other applicable flue piping, with design and installation costs of $9-10 million for one fluidized bed incinerator. One commenter (106.1) provided that the proposed standards would require the addition of a large activated carbon bed, an SNCR for NO_x, a wet ESP to remove submicron particulates, and the addition of caustic to the existing water scrubber to meet the mercury, NO_x, Lead, Cadmium and SO_2 limits; the commenter stated that this would require an investment of over $20 million and have substantial annual operating costs for replacement of the carbon, higher electrical consumption, and other chemicals. Another commenter (110.1) stated that for carbon injection to function their SSI unit would also require a fabric filter, two heat exchangers, and a boiler. One commenter (71.1) stated that an upgraded PM control system, an acid gas control system, and possibly a NO_x reduction

system would be needed to meet the proposed standards ; the commenter (71.1) believed that the costs of these upgraded emission controls would be substantial and in the millions of dollars. One commenter (121.1) expressed concern that their facility would require activated carbon injection, a baghouse, a venturi pak or ring jet scrubbers, and wet electro static precipitator controls, or an impingement tray scrubber, a wet electro static precipitator, and an activated carbon polishing step to meet the proposed standards. Another commenter (138) stated that they would require advance emission controls for both mercury and new opacity limits. Commenters (122, 123) stated that the proposed standards would require the expenditure of significant funds to install additional pollution control equipment that is either untested, marginally effective, or impossible to install due to the design configuration of the existing equipment.

Response: EPA has revised emission limits, as well as the associated beyond-the-floor analysis. Please see Section V Part F of the preamble for EPA's response to the concerns of these commenters. At proposal, and for the final standards, EPA estimated costs and emissions reductions based on the best information available. EPA acknowledges that the inventory database did not have complete information for all SSI units. Consequently, EPA developed defaults for flue gas flow rate, hours of operation, sludge capacity, and other inputs for the proposed rule. EPA has updated analyses using data provided by the commenters. However, for a number of inputs, EPA has still assigned default values where data were not available for each SSI. For the final rule, EPA has correlated some of the defaults to populations served by the facilities in order to better estimate costs and emission reductions more specifically to each facility. Sources will have the best idea of the costs of controls for their site specific conditions. For some sources, the costs and emission reductions estimated by EPA may be higher than what the source estimates, and for others they will be less. EPA's estimates are estimates based on the best information available to us. We also note that the MACT floor costs and emission reductions, and determination of the number of sources estimated to require control, estimated for the final rule are also based on the revised MACT floor limits.

Comment: One commenter (102.1, 116.1) stated that the estimates for control costs provided by EPA were "not on target" for costs associated with compliance or costs on the capital construction side. The commenter (102.1, 116.1) stated that the estimate by EPA to achieve compliance is $200,000; the commenter (102.1, 116.1) provided a cost estimate for carbon adsorption systems and peripheral support equipment of $4.8 million, with total capital costs in the $8-10 million range. Another commenter (138) provided equipment cost estimates of

$5 million for an activated carbon injection system, with design and installation costs adding another $5 million. The commenters (102.1, 116.1, 138) stated that if they are among the top 12% and facing $8-10 million in capital costs, there is a high degree of likelihood that other FBI sites will face higher capital investments to achieve full compliance with the proposed standards.

Response: At proposal, and for the final standards, EPA estimated costs and emissions reductions based on the best information available. EPA acknowledges that the inventory database did not have complete information for all SSI units. Consequently, EPA developed defaults for flue gas flow rate, hours of operation, sludge capacity, and other inputs for the proposed rule. EPA has updated analyses using data provided by the commenters. However, for a number of inputs, EPA has still assigned default values where data were not available for each SSI. For the final rule, EPA has correlated some of the defaults to populations served by the facilities in order to better estimate costs and emission reductions more specifically to each facility. For the final standards we have also revised the types of controls costed to meet the MACT floor limits. For SSI's that we estimate will need further control of PM, Cd, or Pb to meet the MACT floor, we have costed out wet ESP as a more appropriate PM control for high moisture streams. We have also costed out SNCR for SSI's that we estimate will need further control of NO_x to meet the MACT floor limits. As at proposal, we have costed out packed scrubbers for SSI's that we estimate will need further control of HCl or SO_2. At the MACT floor level, we do not estimate that any SSI's will need to add control for Hg, PCDD/PCDF, or CO. A detailed discussion of the costs and emissions reductions estimates for the final standards is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Sources will have the best idea of the costs of controls for their site specific conditions. For some sources, the costs and emission reductions estimated by EPA may be higher than what the source estimates, and for others they will be less. EPA's estimates are estimates based on the best information available to us. We also note that the MACT floor costs and emission reductions, and determination of the number of sources estimated to require control, estimated for the final rule are also based on the revised MACT floor limits.

18.6 Actual Costs to Upgrade are Too High

Comment: Several commenters (58, 102.1, 116.1) claimed their costs to upgrade their incinerators would be too high. Two commenters (102.1, 116.1) stated that several facilities will be required to install extremely high dollar advanced control technology solutions on the exhaust systems of currently existing incineration units in order to meet the proposed standards. The commenters (102.1, 116.1) provided equipment supplier and engineering estimates indicating capital improvements on the order of $28-32,000,000 to equip units with the control technology required to meet the stringent requirements of the Proposed Standard. One commenter (72.1) estimated that the costs for adding the advanced control equipment that was used for the St. Paul, MN and the Ypsilanti, MI applications for fluid bed incinerators is estimated to be about $6.6 million for a single new fluid bed incinerator burning 72 dry ton/day of sewage sludge. Another commenter (73.1) estimated in-house upgrades to cost approximately $5MM per process train, and expressed concerns regarding the available space at the facilities to install such upgrades. One commenter (103.1) provided annual operating costs for chemicals (carbon and ammonia), O&M (additional air pollution control equipment and support systems) and capital costs associated with major modifications to two multiple hearth incinerators (estimated at $25 million capital and $200,000 per year O&M). Another commenter (138) provided a cost estimate of $60,000,000 for advanced emissions control for ten (10) incinerators.

One commenter (102.1) expressed concerns regarding the cost of upgrades for the Metropolitan Sewerage District of Buncombe County, NC, based on the unique nature of their process, including the high nitrogen content in their sludge residuals as well as the use of natural gas as a supplemental fuel source. The commenter (102.1) provided anticipated costs for the upgrade to a carbon injection/absorption and fabric filter system to the order of $5+ million for equipment and $10+ million for design and installation. Another commenter (115.1) remarked that the proposed SSI regulations will add $5-10M to construction costs. The commenter (115.1) stated that future operational and maintenance costs of the air pollution control equipment required to meet proposed standards are expected to be significant and are a tremendous burden, as they add to existing costs already required for flood recovery and normal operations and maintenance.

One commenter (69.1) cited current control costs of close to one billion dollars over the twenty to twenty five-years based on a consent order for CSO abatement and storm water. The commenter (69.1) stated that the SSI regulation provides an additional cost burden that

exacerbates the cost in sewer fees borne by already economically depressed communities. Another commenter (75.1) stated that their facility already needed major upgrades, which exceed one billion dollars, to an aging and undersized wastewater infrastructure to prevent sewer overflows, and that EPA estimated that this proposed regulation will cost an additional 3.4 million dollars in annualized costs. The commenter noted that facilities would need to implement rate increases to cover costs. The commenter (75.1) stated that it is imperative that EPA be sure its SSI emission estimates and assumptions are accurate as possible to avoid costly upgrades that provide little benefit.

One commenter (67.1) stated that their district is currently 90% complete on the design of an $81 million water pollution control facility upgrade for nitrogen removal and related improvements which were initiated in 2009, including a new state-of-the-art fluidized bed incinerator to replace its aging, 24 year old fluidized bed incinerator. The commenter (67.1) stated that the proposed new regulations would impose an additional $6.2 million in emissions control capital improvements as well as the costs to install these improvements.

One commenter (114.1) stated if the proposed rules are implemented, the facility will deflect to maintain existing technology rather than implementing newer technology with the higher costs of greater removal requirements. The commenter (114.1) stated that under the proposed standards, the 35+ year old MH incinerator is compliant with all emission limits but mercury. The commenter (114.1) stated that removing the additional mercury will cost more to ratepayers, and only ends up changing the media where it will occur (water vs. soil).

One commenter (126.1) provided annual operating and maintenance costs. The commenter (126.1) stated that, for a 20 year recovery for capital funding at an interest rate of 4%, the annual operating and maintenance cost of the equipment required for continuous compliance with the proposed NSPS for existing MHF SSIs at their facility is $1,474,678. The commenter (126.1) further provided that the annualized cost of new APC equipment ($1,474,678) divided by the amount of mercury removed each year (0.00701 TPY) equated to an annual present worth of $210 million per ton of mercury removed.

<u>Response:</u> EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. Please refer to the memoranda “Revised Cost and Emission Reduction of the MACT Floor Level of Control” and “Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor

Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants.

Comment: Commenters (131.1) stated that EPA greatly underestimated compliance costs and local financial impacts of the proposed rule. At least one commenter (83.1) stated that if EPA designates sewage sludge as a solid waste and requires the incinerators to comply with CAA §129, many POTWs will lack the financial ability to upgrade their incinerators or will be forced to shift to other options that are more costly than current requirements (for example, landfilling or land application). The commenter (83.1) asserted that sewage sludge is already currently highly regulated under EPA's existing Part 503 and CAA regulations. Another commenter (83.1) provided a research brief and survey to emphasize that local city and county governments currently suffer with tightening local budgets and reduced in the economic downtown. The commenter (83.1) stated that to require ratepayers to bear the burden of incinerator upgrades or other higher-cost options is unreasonable, and that the proposed rule does an inadequate job of considering these local impacts. Another commenter (67.1) stated that should not EPA finalize these proposed standards, they would impose an additional financial burden upon The District and its served communities, in particular the City of New Britain, Connecticut, a distressed community and The District's largest customer, representing 65% of The District's budget.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants.

18.7 Costs of Activated Carbon Injection are Inaccurate

Comment: Two commenters (97.1, 127.1) stated that EPA's cost data assumes that activated carbon can be injected upstream of existing particulate control devices, and does not account for the installation of new fabric filters for each activated carbon injection system installed. Commenters (97.1, 127.1) stated that activated carbon injection systems will require baghouses to collect the carbon injected, and heat exchangers and/or boilers to reduce the exhaust gas temperature below 400 degrees Fahrenheit. The commenter (97.1, 127.1) noted that no existing MHIs are equipped with baghouses for particulate control; rather, the commenter stated that existing MHI units employ wet scrubbers. Some commenters (134.1) expressed concern that EPA did not include the cost of waste heat boilers, condensers, deaerators, boiler feed water pumps, boiler feed water treatment or auxiliary equipment in those cases where a fabric filter was added. The commenters (134.1) further remarked that unlike HMIWI, which can cool their small flue gas volumes by bringing in ambient air or using water conditioning sprays, a SSI must use a waste heat boiler to reliably cool its flue gas. The commenter (134.1) noted that waste heat boilers are used on the three SSIs with fabric filters at the St. Paul Metro WWTP, but were not included in the economic cost analysis.

One commenter (97.1, 127.1) further iterated that wet scrubbers can become clogged by the injected carbon, and this carbon can also be released back into the POTW system through the recycling of the scrubber water to the POTW headworks; the commenter stated that any units equipped with ACIs will require the addition of a fan to pull the exhaust through the fabric filters and a bag leak detection monitor. The commenter (97.1, 127.1) noted that EPA does not account for these capital costs in its beyond-the-floor cost effectiveness analysis for mercury. The commenter (97.1, 127.1) asserted that EPA must consider the annual operating costs of a baghouse, the cost of replacement bags, the cost of electricity to operate fans large enough to pull the exhaust through the fabric filters, and the mercury and other air emissions associated with the generation of this electricity. The commenter (97.1, 127.1) estimated actual capital costs for multiple hearth units will exceed $4 million per incinerator.

Another commenter (101.1) also noted that in EPA's cost estimate for mercury control, particulate matter (PM) control devices for the removal of activated carbon injected into the SSI exhaust were assumed to be already in place. The commenter (101.1) stated that wet scrubbing with plant effluent water is the means of PM and acid gas control for most SSIs. The commenter (101.1) further remarked that EPA failed to consider that the particulate captured is returned to

the wastewater treatment plant's influent, therefore, mercury and other pollutants captured are either lost to the effluent or recycled with the sludge back to the incinerator. The commenter (101.1) stated that the cost estimate should include a fabric filter for all activated carbon injection systems.

Commenters (97.1, 127.1) also stated that EPA failed to account for other costs associated with mercury controls, including additional ductwork, heat exchangers and boilers, and contact chambers. The commenter (97.1, 127.1) estimated $8-10 million for the minimum equipment necessary: a carbon contact chamber and a baghouse for each incinerator, with total capital costs for the 161 MH incinerators in the range of $1.3 - 1.6 billion or higher. The commenter states that applying these mercury control costs to the actual site-specific mercury content reveals extremely high cost effectiveness ratios. The commenter provided an average mercury removal cost of more than $100,000 per pound of mercury removed.

One commenter (129.1) stated that EPA's estimate for the total cost to add simple activated carbon injection for 163 multiple hearth incinerators (roughly $5 million) is unrealistic for an entire activated carbon injection system, consisting of an activated carbon injection system, carbon contact chamber, baghouse and heat exchangers and boilers to reduce the exhaust gas temperature to below 350 deg-F prior to the injection point. The commenter (129.1) provided cost information for the installation of a new fluidized bed incinerator equipped with a proprietary activated carbon adsorbing system at the Ypsilanti, Michigan WWTP to reduce mercury emissions; the capital cost to procure and install the system was roughly $3.5 - $4 million per incinerator (2009$). The commenter stated that the activated carbon would have to be replaced once every three years. The commenter also provided an adjusted estimate (accounting for increases in corrosion resistant metal costs and construction costs) for an activated carbon injection system/baghouse of up to $8-10 million per system, based on bids at Metropolitan WWTP in St. Paul, Minnesota. The commenter stated that these estimates do not include the cost of additional space in a new facility, the cost to renovate or expand an existing facility, the cost to revise the air pollution control train, or the cost to procure and install heat exchangers and/or boilers to reduced the exhaust gas temperature prior to the activated carbon injection point below 350 deg-F. The commenter stated that the total costs for a carbon injection system, carbon contact chamber and baghouse, or the carbon adsorber as contained in the docket for the proposed SSI rule (Docket ID # 2009-0059-0015), do not address these additional costs.

Another commenter (117.1) expressed concerns regarding the design and installation costs of a mercury removal system. The commenter stated that not only will they need to hire an engineer to design a system, but they will need to do it at the same time that other agencies in the country are looking to the same few incinerator consultants. The commenter (117.1) asserted that this cost will be burdensome to the facility, as it does not have the same financial resources that other larger jurisdictions may have.

Response: We have reviewed the commenters' concerns regarding Hg control technologies and agree that applying carbon injection to existing scrubbers has not been demonstrated to be effective at removing Hg. Please refer to the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559). For other combustion sources, carbon injection in combination with a FF has proven to be highly effective in removing Hg. However, we also agree that for high moisture flue gas streams, such as emitted from SSI units, the use of FFs is problematic due to plugging/fouling. In order to use carbon injection with a FF with high moisture streams, a waste heat boiler, RTO, or afterburner is necessary to maintain a high enough temperature to keep the stream above the dew point prior to sending the stream to the FF.

Beyond-the-floor cost analyses were revised based on data corrections received during the comment period, and after re-evaluating the cost effectiveness and environmental impacts of additional mercury control beyond the floor, EPA is not going beyond-the-floor for the final mercury standards. EPA does not expect that units will need to install additional mercury control to meet the final standards.

Comment: One commenter (97.1, 127.1) stated that carbon adsorption for mercury control is a costly option. The commenter provided estimates for activated carbon adsorbers of $3.5 - 4 million per incinerator, and a total capital cost in of $564 - $644 million for the 161 MH incinerators evaluated in the beyond-the-floor analysis. The commenter (97.1, 127.1) stated that the cost to expand existing incineration facilities, add new ductwork and controls, and engineering related design and construction management costs could easily raise the cost of these units. The commenter (97.1, 127.1) stated that there are no U.S. manufacturers of carbon adsorbers and they would have to be imported from overseas. The commenter (97.1, 127.1) also stated that carbon adsorption polishing must be placed after the particulate control device. The commenter (97.1, 127.1) reiterates that the most common existing particulate control for MHIs are wet scrubbers, which generate significant amounts of steam and moisture that are

incompatible with carbon adsorption, and that the exhaust must be heated so that moisture does not condense as it moves through the carbon adsorption system. The commenter (97.1, 127.1) provides the capital costs for an exhaust heater and carbon adsorption system Edmonds, Washington ($1,500,000) and an annualized cost per pound of over $100,000 per pound of mercury removed. The commenter (97.1, 127.1) stated that due to these costs, EPA cannot justify carbon adsorption as a beyond the floor mercury control.

Response: For the final rules, EPA has determined that is it not appropriate to go beyond-the-floor for mercury control.

Comment: A commenter (132.1) who claimed experience using ACI noted EPA has significantly underestimated the cost of the emissions controls that will be necessary to meet the proposed standards. The commenter (126.1) stated that carbon in general requires low flue gas moisture, which has been a challenge to control with a "wet" control system or with the relatively high moisture content of sewage sludge flue gas in general. The commenter (126.1) stated that they have replaced component parts (not the carbon itself) of the system once, with another upcoming replacement projected in the coming months, both instances much sooner than the vendor-stated equipment life, with an additional cost of approximately $400,000 including contract labor. The commenter noted that the scheduled and unscheduled shutdowns have averaged 60 days per component replacement episode, during which they landfilled biosolids. The commenter stated that the carbon that is designed for Hg removal is also only available through European sources and will have been replaced three times in little over 4 years for an additional cost of $190,000. The commenter requested that these costs be considered when projecting the future costs to regulated sources to comply with Hg standards at or beyond the MACT floor.

Response: After evaluating the revised emissions dataset (see the memorandum “Post-Proposal SSI Database Revisions and Data Gap Filling Methodology” (EPA-HQ-OAR-2009-0559) for further details) to determine a revised MACT floor mercury limit and reconsidering the types of controls needed to go beyond-the-floor, it was determined that it would not be appropriate to go beyond-the-floor for any of the pollutants based on cost, emission reductions, and other non-air impacts. Please refer to the preamble to the final SSI rule for a more detailed discussion.

18.8 Additional NO_x Controls

Comment: At least one commenter (75.1) stated that EPA's analysis incorrectly assumes that existing units may meet the proposed NO_x limits. The commenter (75.1) states that due to local permitting stipulations and EPA's determination that add-on NO_x controls are inappropriate for SSI units, that the existing MH and FB units at the facility could not comply with the proposed NO_x limitations. Another commenter (80.1) asserted that SNCR or SCR would be necessary to meet NO_x standards; the commenter stated that add-on controls were necessary because EPA has not accurately accounted for the inverse relationship of CO and NO_x in its MACT floor methodology. One commenter (129.1) stated that while the use of internal afterburners may result in reduced carbon monoxide emissions, most if not all of the POTWs that practice incineration will be required to install external afterburners to meet the potential MACT Standards. The commenter (129.1) provided costs estimates for the procurement and installment of an external afterburning system, along with all appurtenances, engineering services and building space, in the range of $3 - 4 million per unit (not including the cost to renovate or expand an existing facility). The commenter (129.1) also argued that the proposed rule requires the burning of substantial quantities of fossil fuel, will result in a substantial increase in oxides of nitrogen emissions and greenhouse gas emissions. At least three commenters (67.1, 105.1, 137.1) stated that SNCR or SCR may be necessary to meet the proposed NO_x standard even though EPA has assumed that SNCR or SCR would not be necessary. The commenters (67.1, 105.1, 137.1) stated that the inverse relationship between CO and NO_x has not been adequately taken into account when setting the NO_x standard.

At least two commenters (87.1, 112.1) also stated that there are no practical means for controlling NO_x emissions from their existing MHI units. The commenters (87.1, 112.1) remarked that the NO_x content of incinerator exhaust gas is influenced by nitrogen content of the sludge being burned and the amount and type of auxiliary fuel utilized to control combustion. The commenters calculated that approximately 80% of their current NO_X is from combustion of the sewage sludge and not from combustion of the auxiliary fuel. The commenters (87.1, 112.1) concluded that burner modifications (low-NO_X burners) for the incinerators would be unlikely to bring the incinerator into compliance with the proposed NO_x standard.

Response: Based on available emissions data, including additional data and data corrections received during the comment period, EPA expects that the majority of SSI units will be able to meet the final CO standards (3,800 ppmvd for MH units and 64 ppmvd for FB units)

without having to install additional CO control. EPA acknowledges the inverse relationship of NO_x and CO emissions (in terms of the additional NO_x emitted when using supplemental fuel for the afterburner); however, EPA maintains that it is incumbent upon the SSI facility to determine whether combustion conditions can be adjusted to meet both CO and NO_X standards and, if not, install NO_X controls as necessary (e.g., SNCR systems, SCR systems, FGR, or low NO_X burners). In the proposed rule, EPA conjectured reasons why SCR and SNCR were not used or may not be able to be used at SSI units. While we are not aware of any SSI unit that currently uses SNCR or SCR, we also do not know of technical reason why they could not be used. Given the limited data available on SSI units with FGR, we could not definitely determine how effective the technology was on SSI units. However, we also do not know of a technical reason why they could not be used, if necessary, to meet NO_x limits.

Comment: One commenter (145.1) rejected the determination in the proposed regulations that the use of an afterburner or regenerative thermal oxidizer (RTO) could require as much as 1,700 million cubic feet of natural gas a year to be burned and result in NO_x and CO emissions of 84 and 70 TPY, respectively. The commenter argues that although conventional afterburners require enormous quantities of auxiliary fuel, RTO's require very little fuel. The commenter stated that a recent upgrade for a couple of MH incinerators indicated that with the installation of an RTO, the overall auxiliary fuel consumption for the entire incineration system is expected to be reduced. The commenter also stated that, using CO concentration as a surrogate for dioxin and furans, the installation of RTOs would also reduce these pollutants. In addition, the commenter asserted that with the use of a combination of a wet ESP and RTO, flue gases will be very low in particulate and organic matter. The commenter further stated that due to reduced concentrations of pollutants in the flue gas from the RTO, the activated carbon system is expected to last for a reasonable period of time. The commenter provided a total cost for the engineering, equipment, installation, and testing of an RTO at about $4,500,000.

Response: EPA’s estimate of 1,700 million cubic feet of natural gas required per year applies to the proposed beyond-the-floor option of adding an afterburner to all MH units not already having an afterburner or RTO. This estimate was based on the natural gas usage of conventional afterburner retrofits, not RTO systems. We did not include cost estimates for RTOs given space considerations and higher capital costs when compared to afterburner retrofits. The annualized cost for RTO’s was estimated to be four to six times the annualized cost of an afterburner.

Comment: One commenter (145.1) provided flue gas recirculation as an option for the reduction of NO_x emissions. The commenter stated that, when properly operated, flue gas recirculation may significantly reduce NO_x emissions from MH incinerators. The commenter cited stack emission tests conducted at New Haven, CT indicating that with flue gas recirculation installed, the NO_x emission rate could be reduced to about 50 ppmvd @ 7% oxygen or about 2 lb NO_x per ton dry sludge incinerated.

Response: EPA thanks the commenter for their feedback and agrees that flue gas recirculation could be a viable option for the reduction of NO_x emissions. Given the limited data available on SSI units with FGR, we could not definitely determine how effective the technology was on SSI units. However, we also do not know of a technical reason why they could not be used, if necessary, to meet NO_x limits.

Comment: One commenter (129.1) provided cost estimates for the addition of either urea or ammonia to the exhaust gases leaving the incinerator, in order to reduce oxides of nitrogen emissions; the cost to design, procure and install a urea injection system were estimated to be $1.5 - $2 million per incinerator. The commenter stated that use of urea and ammonia results in the conversion of the oxides of nitrogen to nitrous oxide (N_2O), a greenhouse gas.

Response: EPA thanks the commenter for their input. We would need additional information regarding cost and performance to fully evaluate these other technologies.

18.9 Additional Heavy Metal Controls

Comment: One commenter (129.1) stated that an advanced scrubbing system might be required to reduce particulate matter and some of the particulate based cadmium, lead, and mercury. The commenter provided a total cost estimate of $1.25 - $1.75 million/unit (2009$) for the delivery, installment, instrumentation, controls, electrical modifications, and engineering services for a Venturi Pack scrubbing system. The commenter provided projected costs for a wet electrostatic precipitator (WESP) averaging $2.5 - $3 million per wet ESP (2009 $). The commenter added that for their new fluidized bed incineration project, approximately 15 feet would have to be added onto the new facility to house the wet ESPs and associated equipment.

Response: EPA has re-evaluated the control options for particulate matter and metals and agrees with commenters that, for SSI units, venturi scrubbers and WESP systems would be more effective control options than fabric filters. WESP costs have been incorporated into EPA's revised cost estimates for units already having venturi scrubbers but still expected to need

additional control. The capital costs ranged from $2.3 to $2.8 million (2008$), which is in keeping with the commenter's estimate. Please see the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" (EPA-HQ-OAR-2009-0559) for further details. For units requiring further control that do not already have venturi scrubbers, costs for venturi scrubbers were estimated and incorporated into the total compliance cost.

18.10 Additional SO_2 Controls

Comment: One commenter (129.1) also provided cost estimates for the reduction of sulfur dioxide and oxides of nitrogen emissions. The commenter provided costs for the addition of sodium hydroxide to the wet scrubbing systems; the costs to design, procure and install a sodium hydroxide addition system were estimated to be $0.25 - $ 0.3 million per incinerator (2009$).

Response: The cost algorithms used for EPA's analyses include the equipment and materials necessary to operate packed bed scrubbers. EPA notes that we are not going beyond the floor for these pollutants.

18.11 Unfair Impacts for Existing Fluidized Bed Incinerators

Comment: Some commenters (80.1, 137.1) stated that the proposed standards represent a penalty for facilities that have replaced aging MHI with far more efficient and lower polluting FBI. The commenter (80.1) stated that newer FBI units generally have better emissions controls than MHI units, therefore, the emissions test data for FBIs used by EPA to establish MACT floors were generally significantly lower than those for MHIs. The commenters (80.1, 137.1) stated that existing MHIs will likely meet the applicable, less stringent, standards with the exception of mercury, which can be met by retrofitting activated carbon adsorption. The commenters (80.1, 137.1) stated that the more stringent standards for existing FBIs may require modifications to the existing wet scrubbers and/or additional wet scrubbers (e.g., packed towers) to meet HCl and SO_2 limits, and addition of WESPs where venturi scrubbers are currently used to meet Cd, Pb and PM limits, in addition to carbon adsorption systems to meet proposed Hg standards.

Response: EPA acknowledges that FB units have more stringent limits to meet, but this is because, as the commenter notes, they are generally more efficient and lower polluting. The

MACT floor limits are intended to represent the best performing units. Please refer to Section V, Part C of the preamble for EPA's response to MACT floor methodology concerns.

18.12 Regulation Forces Incinerator Closures

Comment: Several commenters (87.1, 74.1, 68.1, 58, 69.1, 61.1, 78.1, 63.1, 94.1, 70.1, 67.1, 107.1, 106.1, 102.1, 116.1, 114.1, 121.1, 120.1, 115.1, 138, 73.1, 89.1, 93.1, 101.1, 109.1, 105.1, 117.1, 118.1, 126.1, 136.1) stated that EPA's proposed new source performance standards could effectively eliminate the construction of new sewage sludge incinerators (SSIs), and the standards for existing SSIs could force many communities to abandon incineration as early as 2016. One commenter (72.1) stated that due to bond financing, their facilities would need to abandon incineration by 2014. At least one commenter (81.1) stated that due to the cost, the proposed standards would eliminate planned incinerator improvements and may result in the de-commissioning of units currently in operation. These commenters (87.1, 74.1, 68.1, 58, 69.1, 61.1, 78.1, 63.1, 94.1, 70.1, 67.1, 107.1, 106.1, 120.1116.1, 114.1, 120.1, 115.1, 73.1, 93.1, 101.1, 109.1, 105.1, 117.1, 118.1, 126.1, 136.1) stated that loss of incineration as a viable management option will have major economic consequences (72.1, 81.1, 103.1, 89.1), eliminate a major green energy source (94.1, 68.1, 69.1, 107.1, 106.1, 103.1, 102.1, 116.1, 114.1, 120.1, 115.1), and result in a transfer of emissions from SSIs, which are already controlled under the Clean Water Act Part 503 regulations, to the tens of thousands of trucks that will be needed to haul the Nation's sludge to landfills across the country (72.1, 81.1, 94.1, 68.1, 70.1, 70.1, 67.1, 69.1, 107.1, 106.1, 103.1, 102.1, 116.1, 114.1, 120.1, 115.1). Another commenter (73.1) stated that the trucks are notorious major sources of NOx, VOC, and green house gas emissions, including fugitive methane.

At least one commenter (126.1) stated that the proposed standards would severely restrict a POTW's ability to modify existing multiple hearth incinerators, including modifications to improve combustion efficiency or provide energy recovery for electricity generation and virtually eliminate all new MHF SSI construction. Another commenter (49.1) argued that EPA should not force closure of the 160+ MH incinerators that were built before 1980 and currently use outdated control equipment. The commenter (49.1) stated that, for existing MH units, upgrading the scrubber and dewatering devices could result in better MH performance, while being able to keep the buildings, HVAC, piping and MH infrastructure. The commenter (49.1) asserted that it is unfair that the citizens of communities whom have invested hundreds of

millions of dollars in capital be forced to abandon major MH incinerator infrastructure without being given the knowledge and cost about appropriate dewatering and scrubber equipment upgrades. One commenter (107.1) stated that the proposed regulations will force small entities to treat sewage sludge to meet the land application requirements of 40 CFR Part 503; the commenter noted that this will require a capital investment of several million dollars.

Several commenters (97.1, 127.1, 110.1, 118.1, 121.1, 128.1, 90.1) stated that the promulgation of the proposed emission limits for SSIs will significantly discourage incineration as a sludge management option. One commenter (118.1) specifically stated that due to increased costs for incineration for upgraded scrubber equipment, new CEMS equipment, increased stack test frequency and increased record keeping requirements, they would have to reconsider using incineration as a sludge disposal option. Commenters (128.1, 90.1) stated that EPA must consider that POTWs have limited options to manage their sewage sludge (i.e., incineration, land application, composting, energy production, and landfilling) and must develop a comprehensive view of how sewage sludge waste should be handled throughout the United States. Some commenters (85.1, 97.1, 127.1, 110.1) noted that there are state and local restrictions that prevent the landfilling of biosolids, which further restricts options for POTWs. Another commenter (97.1, 127.1) stated that EPA should consider incineration as a local option for residuals management and as an emerging renewable energy source for generating electricity and steam.

Response: At proposal for the MH new source subcategory, we considered the best-performing FB incinerator to be the best-performing similar source because we were not aware of any new MH sources that have been constructed in the last 20 years, and information provided by the industry indicates that future units that will be constructed are likely to be FB incinerators. We have re-evaluated our decision. Although few MH units have been constructed over the last 20 years, there is no technical reason that would preclude a source from constructing a MH unit. Therefore, we are setting separate standards for MH units at new sources in order to not limit potential options POTW can use to dispose of waste. We still believe that new SSI units constructed will be FB units because of the many advantageous of FB units over MH units.

The definition of "modification" is from Section 129 of the CAA. The addition of pollution controls in order to meet limits is not considered a modification. Our responses to modification concerns are addressed in section 3.0 of this document.

EPA notes that the emission limits have been revised since proposal. Limits are based on data collected, following established procedures that incorporate variability.

EPA would like to clarify that at proposal, we were not requiring facilities to landfill; landfilling was merely considered as a potential alternative disposal option for facilities unable to meet the limits without installing additional pollutant control. In our revised cost analyses, we re-evaluated the landfilling option and determined that it was not appropriate or cost effective for most facilities.

Comment: One commenter (48.1) stated that a seven year period from the start of a Request for Proposals to being able to abandon the use of their multiple hearth incinerators would be realistic. The commenter (48.1) is concerned about an additional 30 million dollar solids handing system that would be required for them to be compliant with the schedule of the current rulemaking in addition to their recent mandated treatment-plant expansion (to be completed by 2014) to address secondary treatment requirements which is costing their ratepayers over 40 million dollars. Similarly, another commenter (138) is concerned about the additional costs that would be passed on to their customers should they become subject to the proposed rule (by meeting the definition of modification) by making wet weather improvements to their incinerators.

Response: EPA would like to clarify that at proposal, we were not requiring facilities to landfill; landfilling was merely considered as a potential alternative disposal option for facilities unable to meet the limits without installing additional pollutant control. In our revised cost analyses, we re-evaluated the landfilling option and determined that it was not appropriate or cost effective for most facilities.

At proposal for the MH new source subcategory, we considered the best-performing FB incinerator to be the best-performing similar source because we were not aware of any new MH sources that have been constructed in the last 20 years, and information provided by the industry indicates that future units that will be constructed are likely to be FB incinerators.
We have re-evaluated our decision. Although few MH units have been constructed over the last 20 years, there is no technical reason that would preclude a source from constructing a MH unit. Therefore, we are setting separate standards for MH units at new sources in order to not limit potential options POTW can use to dispose of waste. We still believe that new SSI units constructed will be FB units because of the many advantageous of FB units over MH units. The definition of “modification” is from Section 129 of the CAA. The addition of pollution controls

in order to meet limits is not considered a modification. EPA notes that the emission limits have been revised since proposal. Limits are based on data collected, following established procedures that incorporate variability.

18.13 Space Constraints

Comment: Several commenters (80.1, 69.1, 121.1, 73.1, 96.1, 129.1, 134.1) provided that their facility is already space constrained; reconfiguring or adding additional controls in the limited space would either be very costly or cost prohibitive. One commenter (111.1) specifically stated that there is no space available to install additional emission control systems, providing that local ordinances include building height restrictions. One commenter (134.1) stated that an afterburner would be required to burn out the unburned carbon and soot that exit a typical MH unit. The commenter (134.1) asserted that the space required for the afterburner, waste heat boiler, and fabric filter would be approximately three times the space of the existing MH unit, stating that the concept of adding afterburners, waste heat boilers, and fabric filters to existing MHs is impractical, and in most cases, physically impossible. Another commenter (69.1) stated that site facilities are limited in grounds available for expansion due to geographical constraints - rivers, state borders, and railroads. Specifically, one commenter (126.1) asserted that their original incinerators were built to take up a minimal footprint; thus, the space within and around the incinerator building are already severely constrained. The commenter (126.1) estimates that the modifications required for additional controls would therefore incur significant cost. The commenter (126.1) stated that a new air pollution control equipment train (including WESP, RTO with FD fan, carbon polisher and free standing exhaust stack) must be located approximately 350 feet away from the MHF SSIs due to existing space limitations and site constraints, and a second active carbon polisher (for mercury removal from the exhaust gas exiting the existing RTO) must be located approximately 50 feet away from the existing equipment. The commenter (126.1) provided a total estimated current capital cost for the modifications to the existing MHF SSIs of $9,600,000.

At least one commenter contended (65.1) that further modifications are estimated to incur significant cost due to the restriction on available space. One commenter (134.1) stated that due to the lack of adequate space, the proposed regulation could lead to the closure of several SSI facilities.

Response: Based on our revised analyses, we believe that many SSI's will be able to comply with the final rules without the addition of multiple control technologies. Additionally, the control cost algorithms used in these analyses include retrofit factors that take into account space considerations.

18.14 Additional Cost Concerns

Comment: At least one commenter (76.1) requested justification for increased monitoring costs. The commenter (76.1) stated that monitoring costs must consider new parametric monitoring, monitoring carbon flow rate and carrier gas flow rate for carbon injection, monitoring of scrubber pH and scrubber water flow rate for use of a wet scrubber to remove HCI, and particulate monitors for ash handling. One commenter (89.1) requested that EPA calculate the increased economic and resource burden to facilities regarding the recordkeeping and reporting requirements under the Proposed Standards. Another commenter (93.1) identified additional costs in permitting, testing, training and administrative efforts in being regulated under the proposed rule at $130,000 per year.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. EPA is required to incorporate continuous compliance requirements into its MACT standards, such as CEMS or continuous parametric monitoring. The revised costs include the incorporation of relevant monitoring requirements for the final rule. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants. EPA has also prepared a burden estimate for affected sources of the recordkeeping and reporting requirements. The results of the burden estimate are summarized in the preamble to the final SSI rules and in the supporting statement to EPA's OMB-83 form.

Comment: One commenter (76.1) contended that there will be significant impact on small entities including new equipment costs, increased O&M costs, and increased labor costs.

Furthermore, the commenter (76.1) asserted that EPA's determination that using CEMS is more cost effective than an annual source test is not true given the full time equivalent personnel necessary to keep CEMS calibrated and online. The commenter (76.1) stated that the decision to use all CEMS or a combination of CEMS and annual source testing is site specific, and requested that flexibility be built into the regulation for appropriate site specific monitoring as determined by the POTW.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. These revisions include the incorporation of relevant monitoring requirements for the final rule. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants.

EPA would also like to clarify that CEMS are optional except for CO CEMS for new sources. Our small entity analysis is also discussed in the preamble the final SSI rules.

18.15 Greenhouse Gases and Fossil Fuel Use Would Increase

Comment: A commenter (121.1) argued that GHG emissions would increase since the beyond-the-floor limits are cost prohibitive. The commenter stated that their facility captures waste heat from the incineration process and uses it in the wastewater treatment process, and if incineration is stopped that energy requirement will be supplied by the electric utility. The commenter indicated that incineration has been shown by Metropolitan St. Louis Sewer District as the last GHG producing method of disposal compared to landfill disposal.

One commenter (97.1, 127.1) stated that EPA is required to consider energy impacts as part of its beyond the floor analysis. The commenter (97.1, 127.1) asserted that EPA should consider the projects currently underway that generate electricity from the heat produced by SSIs, noting that electricity generated by the SSI reduces the POTW demand for electricity from the grid. The commenter stated that reduced demand for electricity from the grid means less coal

combustion and less of the emissions that coal would have generated, including less mercury emissions and less reliance on fossil fuels. The commenter was of the opinion that the proposed beyond the floor controls could discourage this advanced energy option, resulting in more coal combustion and more mercury emissions.

Response: Beyond-the-floor cost analyses were revised based on data corrections received during the comment period. After re-evaluating the cost effectiveness and environmental impacts of additional control beyond the floor, EPA is not going beyond-the-floor for the final standards. Energy generated by SSI units was not incorporated into the beyond-the-floor analysis because we did not have energy generation data available; however, estimated energy usage required for beyond-the-floor controls was considered. Please refer to the memorandum "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for further details.

18.16 Environmental Benefits of Incineration

Comment: Several commenters (72.1, 58, 62.1, 63.1, 67.1, 68.1, 69.1, 70.1, 74.1, 78.1, 81.1, 102.1, 103.1, 106.1, 107.1, 114.1, 115.1, 116.1, 120.1, 61.1, 73.1) stated that EPA must develop environmentally and economically sound standards by considering energy recovery options. Specifically, these commenters (72.1, 58, 62.1, 63.1, 67.1, 68.1, 69.1, 70.1, 74.1, 78.1, 81.1, 102.1, 103.1, 106.1, 107.1, 114.1, 115.1, 116.1, 120.1, 61.1, 111.1, 121.1, 101.1, 109.1, 105.1, 112.1, 117.1, 118.1) stated that EPA has underestimated emission control costs and overestimated the baseline emissions from existing SSI. Many of these commenters stated that based on these costs, the proposed standards, if implemented, would result in many wastewater utilities sending sludge, an energy-rich secondary material, for disposal in a landfill. At least one of these commenters (58) stated that the proposed regulation would limit municipalities sludge management options and greatly increase sludge disposal costs. Commenters (58, 62.1, 63.1, 67.1, 68.1, 69.1, 70.1, 74.1, 78.1, 81.1, 102.1, 103.1, 106.1, 107.1, 114.1, 115.1, 116.1, 120.1, 61.1, 75.1, 101.1, 93.1, 105.1, 109.1, 112.1, 117.1, 118.1) were of the opinion that the proposed standards should encourage upgrades to newer, cleaner incinerators with energy recovery that would offset the energy needs for treating wastewater. The commenters (58, 62.1, 63.1, 67.1, 68.1, 69.1, 70.1, 74.1, 78.1, 81.1, 102.1, 103.1, 106.1, 107.1, 114.1, 115.1, 116.1, 120.1, 61.1, 74.1, 72.1, 90.1, 113.1, 94.1, 73.1, 89.1, 109.1, 105.1) stated that, given that increasing economic challenges and expanding regulation, EPA must ensure its policies are environmentally and

economically sound, and that those policies should allow municipalities to engage in practices that can maximize their resources and limit their carbon footprint.

One commenter (129.1) stated that greenhouse gas emissions from sewage sludge incinerators can be substantially lower than the greenhouse gas emissions associated with other sewage sludge management options. Other commenters (108.1, 134.1) stated that EPA should reconsider the use of biosolids as a renewable fuel source in developing the proposed standards. One commenter (134.1) requested that EPA clarify the impact of the rule on technologies that focus on reuse of wastewater solids for energy production and recovery, such as gasification, pyrolysis, boilers, and fluid bed combustors.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants. EPA would like to clarify that at proposal, we were not requiring facilities to landfill; landfilling was merely considered as a potential alternative disposal option for facilities unable to meet the limits without installing additional pollutant control. In our revised cost analyses, we re-evaluated the landfilling option and determined that it was not appropriate or cost effective for most facilities. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

EPA has clarified in the final rule that sewage sludge that is not burned in an SSI unit located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to other section 129 standards, such as the CISWI standards (40 CFR part 60, subparts CCCC and DDDD of this part), the OSWI standards (40 CFR part 60, subparts EEEE and FFFF), the MWC standards (40 CFR part 60, subparts Ea, Eb, Cb,AAAA, and BBBB of this part) or the Hazardous

Waste Combustor rule (40 CFR part 63 subpart EEE). Facilities that are unsure if their process is a combustion process, are welcome to submit a formal applicability determination to the Agency.

18.17 Energy Recovery Would be Reduced

Comment: One commenter (108.1) stated that the proposed ruling effectively bans recovery of the energy resources inherent in biosolids and appears to promote landfilling. Commenters (48.1) claimed that the Proposed Regulation will end their efforts towards energy recovery from their incineration and solids handling practice. One commenter (108.1) specifically claimed that the proposed standards will eliminate an existing biomass incinerator as an option to generate electricity from biosolids. Another commenter (108.1) stated that in addition to the potential elimination of energy recovery options (including using gasification to produce a syngas that can be combusted to produce energy in a generator, steam reformation to produce a hydrogen gas that can be used as a liquid transportation fuel, and conversion of biosolids to a solid fuel that can be used as an alternative feedstock at a biomass to energy facility), there is a negative perception created by the proposed rule's suggested alternative of landfilling.

At least one commenter (75.1) argued that incineration is a necessary part of managing sludge at their facility, especially during the winter and early spring. The commenter (75.1) stated that their energy recovery (incineration) system offsets a significant portion of the electricity and natural gas consumption by utilizing the steam produced from incineration to heat the majority of all plant facilities and to satisfy domestic and process hot water needs. The commenter noted that during winter and early spring, approximately 90% of biosolids are hauled to the landfill or incinerated, stating that there is no storage capacity at the facility. One commenter (97.1, 127.1) stated that incineration provides them with an option for energy recovery, which will offset approximately 25 percent of the current demand for electricity each year. The commenter (97.1, 127.1) concluded that this demand reduction reduces the mercury emissions and other air contaminants associated with utility coal combustion. The commenter (97.1, 127.1) also provided that many states, such as Ohio and California, recognize the generation of electricity from sewage sludge as eligible for renewable energy credit, which provides additional economic incentives to invest in the electric-generating equipment for SSIs.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period,

EPA has revised its cost estimates for MACT and beyond-the-floor control options. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants.

EPA would like to clarify that at proposal, we were not requiring or even encouraging facilities to landfill; landfilling was merely considered as a potential alternative disposal option for facilities unable to meet the limits without installing additional pollutant control. In our revised cost analyses, we re-evaluated the landfilling option and determined that it was not appropriate or cost effective for most facilities. Emission limits have been revised since proposal, and this may alleviate some of the commenters' concerns.

18.18 Other

Comment: One commenter (48.1) questioned the number of facilities (112) presented on the Fact Sheet compared to the earlier value of 196 facilities.

Response: Based on additional data received during the comment period, EPA has revised its inventory of SSI facilities and units. The revised inventory comprises a total of 204 units (60 FB and 144 MH) at 110 facilities. The 196 value the commenter notes is likely an outdated unit count, rather than a facility count. Please refer to the memorandum "Post-Proposal SSI Database Revisions and Data Gap Filling Methodology" (EPA-HQ-OAR-2009-0559) for further details on the unit inventory revisions.

Comment: One commenter (96.1) requested that the EPA not rush to finalize the rules; the commenter stated that more time is needed to understand the implications of setting mercury limits below the MACT limits, utilities alternates, the true costs for utilities and the time allowed for compliance. The commenter (96.1) stated that failing to do so will result in higher costs and unintended social and environmental impacts.

Response: EPA has taken the time to revise the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control

options. Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details.

Comment: Several commenters (129.1, 102.1, 116.1, 138) stated that the projected benefits would be lower than estimated. One commenter (84.1, 119.1) stated that while the proposed rule would have significant reductions in annual mercury and dioxin emissions, reductions in other emissions are less substantial. The commenter (84.1, 119.1) stated that proposed rule will reduce emissions of lead, cadmium, and particulate matter by less than half and would have virtually no effect on NOx emissions. Some commenters (129.1, 138) specifically expressed concern that the projected health related cost savings estimated by EPA were "substantially overestimated". Several commenters (61.1, 88.1, 90.1, 132.1, 136.1) suggested that EPA should consider energy-recovery and/or renewable energy generation as an option. One commenter (129.1) stated that the proposed cost-benefit analysis does not adequately address the concerns raised during the Federalism conference call.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its impacts analyses for MACT and beyond-the-floor control options. We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. Please refer to Section V, Part F of the preamble for further information regarding the revised health/benefits analysis.

Comment: Two commenters (122, 123) stated that they were extremely concerned that numerous provisions of the proposed Guidelines result in over regulation and unachievable control of emissions. Another commenter (108.1) suggested that the proposed sewage sludge incineration standards are the most restrictive in the world and stated that the limits will not be achievable or supported by the equipment manufacturers. The same commenter (108.1) said that the implications to the wastewater industry will be significant and will likely result in greater environmental impacts and additional financial burden for the public.

Response: EPA has revised the limits for existing and new sources and believes, given the available emissions data, that the limits are achievable with the installation of appropriate controls where needed.

Comment: One commenter (138) points out that the EPA press release dated October 1st, 2010 states that EPA estimated the proposed ruling would yield health benefits ranging from 130,000,000 to 320,000,000 in 2015. Commenters (76.1, 138) are concerned about the pathway claimed in the press release (that the mercury emitted from the incinerators deposits in the water where it changes into methyl-mercury which can then bioaccumulate in fish – and when these fish are consumed by humans, particularly children or pregnant women, there is a risk of damage to the developing brain). The commenters (76.1 138) want to know whether a health risk assessment had been done to demonstrate this pathway and calculate the actual health risks; and if so, where is this information published such that the public can review and comment on it. One commenter (76.1) stated that the Agency should provide this published information to the scientific and regulated community for review and use the proper costs to calculate the social benefit.

Response: The health benefits assessment is available in the Regulatory Impact Analysis developed for the proposed rule, which is available at http://www.epa.gov/ttn/ecas/ria.html. Due to time limitations under the court-ordered schedule, EPA was unable to analyze the mercury deposition, methylation, bioaccumulation in fish tissue, and human consumption of mercury-contaminated fish that would be needed in order to estimates the human health benefits from reducing mercury emissions. However, this analysis did estimate the monetized health benefits from reducing fine particles and particle precursors such as NOx and SO_2. Although the monetized benefits are likely an underestimate of the total benefits, the extent of the underestimate is unclear.

Comment: Some commenters (88.1, 129.1) stated that EPA did not adequately address additional impacts, including the potential loss of human life and injuries associated with the significant increases in transportation to and from the disposal of the sewage sludge at municipal solid waste landfills or land application sites, increased air pollution and noise, additional criteria, toxic, and greenhouse gas pollutant emissions from increased trucking.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. Table 14 of the preamble summarizes the revised costs and impacts of this alternative if small entities choose to

landfill rather than incinerate sewage sludge. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (82.1) stated EPA should commit to providing guidance and technical assistance to POTWs in implementing the proposed rule. The commenter (82.1) is concerned for smaller facilities that are already implementing a number of requirements under the Clean Water Act with limited staff and resources. The commenter (82.1) stated that implementing requirements of the Clean Air Act will be unfamiliar territory and can be done more effectively with assistance from EPA.

Response: EPA plans to provide guidance after the rule is finalized.

19.0 IMPACTS ANALYSIS –SMALL BUSINESS

Comment: One commenter (51.14) wanted to know the basis for EPA's determination that the Proposed Standards will not have a "significant economic impact" on a substantial number of small entities.

Response: Small entities include small businesses, small organizations, and small governmental jurisdictions. For purposes of assessing the impacts of this action on small entities, a small entity is defined as follows: 1) a small business as defined by the SBA regulations at 13 CFR 121.201; 2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; or 3) a small organization that is any not-for-profit enterprise that is independently-owned and operated and is not dominant in its field. In the proposal, EPA certified that there would not be a significant economic impact on a substantial number of small entities. The economic analysis conducted at proposal identified 18 small entities, none of which had cost-revenue-ratios greater than one percent. The cost analysis for the final standards showed a significant decrease (35 to 98 percent) in all costs for 11 of the 18 small entities and the same decrease in annualized costs for the remaining small entities while their estimated capital costs stayed at the same level as those estimated at proposal. Therefore, given the decrease in costs from the proposed rule, we consider the final rule to have no significant impact on a substantial number of small entities. Please refer to the preamble to the final rule and the RIA for a more detailed description of the small entity analysis.

The cost-revenue-ratios were again estimated using the costs for the final rule and the same revenue estimates used in the proposal screening analysis. The revenue estimates were obtained using census average per capita revenue numbers ($1,696 for entities with populations between 10 thousand and 25 thousand and $1,677 for entities with populations between 25 thousand and 50 thousand) The resulting cost-revenue-ratios ranged between 0.04% and 0.5. Thus all cost-revenue-ratios were well below 1%.

Comment: The commenter (97.1, 127.1) is concerned about the small entity impacts discussed in EPA's Option 3 of the Regulatory Impacts Analysis. In particular, the commenter (97.1, 127.1) is concerned about the beyond the floor mercury controls as EPA identified that it will significantly affect 16 of 18 small entities at greater than 1 percent of their cost-revenue ratios and three of those at greater than 3 percent. The commenter (97.1, 127.1) stated that these

levels of impact would require a more thorough consideration of small entity impacts based on EPA's Final Guidance for EPA Rulewriters: Regulatory Flexibility Act as Amended by the Small Business and Regulatory Enforcement Fairness Act (November 2006) (disallowing a presumption of No SISNOSE at these levels of impact). The commenter (97.1, 127.1) stated that only by assuming the cost-effective landfill alternative for small entities could the Administrator presume No SISNOSE under this guidance and shortcut the administrative protections that the RFA and Small Business Regulatory Fairness Act ("SBREFA") provide for small governments.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details. The economic analysis conducted at proposal identified 18 small entities, none of which had cost-revenue-ratios greater than one percent. The cost analysis for the final standards showed a significant decrease (35 to 98 percent) in all costs for 11 of the 18 small entities and the same decrease in annualized costs for the remaining small entities while their estimated capital costs stayed at the same level as those estimated at proposal. Therefore, given the decrease in costs from the proposed rule, we consider the final rule to have no significant impact on a substantial number of small entities.

The cost-revenue-ratios were again estimated using the costs for the final rule and the same revenue estimates used in the proposal screening analysis. The revenue estimates were obtained using census average per capita revenue numbers ($1,696 for entities with populations between 10 thousand and 25 thousand and $1,677 for entities with populations between 25 thousand and 50 thousand) The resulting cost-revenue-ratios ranged between 0.04% and 0.5. Thus all cost-revenue-ratios were well below 1%.

Comment: One commenter (97.1, 127.1) urged EPA to abandon the landfill alternative presumption that it used to shortcut small government relief under RFA and UMRA. Instead, the commenter (97.1, 127.1) recommended that EPA consider the full cost of its proposed control

technology on small entities and engage in the appropriate RFA/UMRA processes to evaluate ways to mitigate the burden of this rule on these small entities. The commenter (97.1, 127.1) stated that EPA's fundamental misconception about the nature of sewage sludge affects many aspects of the Proposed Rule. The commenter (97.1, 127.1) said that it is confident that when EPA corrects its cost analysis for small entities, the landfill alternative will not be cost-effective for many if not all of the small entities. As an example, the commenter (97.1, 127.1) said that the City of Edmonds, a small government entity located in Washington State, has reported that it has no intention of trucking its sewage sludge to a landfill, the closest of which is 270 road miles away. The commenter (97.1, 127.1) provided the following to support their argument:

- The commenter (97.1, 127.1) stated that EPA's cost analysis for the landfill alternative is based on dry tons of sludge, which underestimates the amount of sludge being sent to a landfill by a factor of three to five.
- The commenter (97.1, 127.1) purported that the landfill alternative requires as many as five times more truck loads, and argued that EPA overestimated the amount of sludge a single truck can hold. The commenter (97.1, 127.1) stated that EPA estimated that 34 tons of sewage sludge can be hauled in each truck, when in reality only 15-20 tons can be hauled per truck based on the 80,000 pound total truck weight limit for roadways in Ohio. The commenter (97.1, 127.1) indicated that this alone doubles the cost that EPA assumed to be associated with trucking sewage sludge to landfill.
- The commenter (97.1, 127.1) argued that the landfill alternative requires five times more landfill tipping fees, and five times as much on-site storage and loading capacity.
- The commenter (97.1, 127.1) argued that EPA assumed that onsite storage capacity would require a cement pad with a railing, instead of the more costly tankage necessary to contain sludge that is 70-80 percent water.
- The commenter (97.1, 127.1) argued that EPA failed to consider the cost and limitations associated with landfills rejecting wet sludge due to capacity restrictions and moisture limitations. The commenter (97.1, 127.1) stated that POTWs will have to transport sludge farther in search of landfill capacity willing and able to take wet sewage sludge.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. Table 14 of the preamble summarizes the revised costs and impacts of this alternative if small entities choose to landfill rather than incinerate sewage sludge. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (107.1) said that the City of Anacortes, a small government entity located in Washington State, would be forced by this regulation to abandon the investment of approximately 3.5 million dollars (1992) in structures and equipment to incinerate sewage sludge; this will necessitate an investment in another method of sewage sludge disposal. The commenter (107.1) stated that while land filling (the disposal option identified by EPA) may be what Anacortes would initially rely upon, it is very unlikely that land filling would be a viable long term disposal option; especially when the other SSIs that likely will be forced to make the same decision are taken into account.

Response: EPA has revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details. Additionally, in our revised cost analyses, we re-evaluated the landfilling option and determined that it would not appropriate or cost effective for most facilities. EPA notes that the commenter's concern may be alleviated with the revised emission limits.

Comment: One commenter (58) stated that their facility is a "small entity" serving a population of only 50,000. The commenter (58) is concerned that these proposed standards will increase the cost of sewage sludge management for their residents and local industry.

Response: In the proposal, EPA certified that there would not be a significant economic impact on a substantial number of small entities. The economic analysis conducted at proposal identified 18 small entities, none of which had cost-revenue-ratios greater than one percent. The cost analysis for the final standards showed a significant decrease (35 to 98 percent) in all costs for 11 of the 18 small entities and the same decrease in annualized costs for the remaining small entities while their estimated capital costs stayed at the same level as those estimated at proposal. Therefore, given the decrease in costs from the proposed rule, we consider the final rule to have no significant impact on a substantial number of small entities. The cost-revenue-ratios were again estimated using the costs for the final rule and the same revenue estimates used in the proposal screening analysis. The revenue estimates were obtained using census average per capita revenue numbers ($1,696 for entities with populations between 10 thousand and 25 thousand and $1,677 for entities with populations between 25 thousand and 50 thousand) The resulting cost-revenue-ratios ranged between 0.04% and 0.5. Thus all cost-revenue-ratios were well below 1%.

Comment: One commenter (54.1, 60.1) disagreed with EPA's assumption described on page 63288, Part 5 (B.5) that "all fine particles, regardless of their chemical composition, are equally potent in causing premature mortality because there is no clear scientific evidence that would support the development of differential effects estimates by particle type." The commenter (54.1, 60.1) argued that PM mass should not be used as a surrogate for toxicity and health effects because major components have been shown to be innocuous; and trace components such as metals have been shown to be highly toxic. The commenter (54.1, 60.1) stated that ambient air PM is a chemically non-specific pollutant; it is a collection of compounds, aerosols, elements, etc, with widely varying potencies and sources.

Response: EPA's Integrated Science Assessment on Particulate Matter (U.S. EPA, 2009), which was reviewed by EPA's Clean Air Scientific Advisory Committee, concluded, "Overall, the results indicate that many constituents of PM can be linked with differing health effects and the evidence is not yet sufficient to allow differentiation of those constituents or sources that are more closely related to specific health outcomes." In addition, the Health Effects Subcommittee (HES) of EPA's Advisory Council on Clean Air Compliance Analysis concluded in 2009, "The

HES agrees that the scientific evidence does not currently support this sort of assessment. Additionally, the HES finds that differential assessment, even if feasible – would not lead to substantially different results." Therefore, EPA assumes that all fine particles are equally potent until the scientific literature clearly supports the development of a different methodology.

20.0 IMPACTS ANALYSIS –LANDFILLING COSTS

20.1 Landfill Disposal Cost Basis

Comment: One commenter (90.1) stated that every POTW has a different way of determining its cost to incinerate and the data collected through EPA's information collection request did not include enough information to accurately determine unit costs. The commenter (90.1) recommended that EPA conduct a more accurate analysis of the actual costs to incinerate versus the cost to landfill needs. Other commenters (58, 61.1, 63.1, 65.1, 68.1, 69.1, 70.1, 71.1, 72.1, 73.1, 74.1, 75.1, 78.1, 83.1, 87.1, 89.1, 90.1, 93.1, 94.1, 96.1, 97.1, 127.1, 101.1, 102.1, 103.1, 105.1, 106.1, 107.1, 109.1, 110.1, 111.1, 112.1, 114.1, 115.1, 116.1, 118.1, 120.1, 121.1, 126.1, 128.1, 129.1, 132.1, 136.1, 138, 117.1) stated that EPA incorrectly developed costs on a dry ton basis, instead of a wet ton basis, so the actual landfill disposal costs would be 3 to 10 times higher than EPA estimates (the stated amount/increase varied between commenters). One commenter (97.1, 127.1) provided that EPA incorrectly presumed that the 100 dry ton/day SSI would feed and combust 100 tons of sewage sludge per day (EPA presumes incorrectly that the material fed into an SSI is dry and does not contain moisture). The commenter (97.1, 127.1) asserted that sewage sludge is typically only 20-30 percent solids and 70-80 percent moisture; and while SSIs are rated based on the number of dry tons per day they can combust, the sewage sludge being fed into the incinerator is not dry. The commenter (97.1, 127.1) stated that when sewage enters the POTW headworks it is over 99 percent water; and the POTW processes increase the solids content to about 4 percent before it is “dewatered.”

Numerous commenters (69.1, 70.1, 72.1, 87.1, 93.1, 97.1, 127.1, 102.1, 112.1, 116.1, 118.1, 121.1, 49.1, 111.1, 129.1, 117.1) performed their own cost analysis of land filling sludge versus incineration. One commenter (69.1) said that landfill costs would be $108 per dry ton, while incineration costs are $37 per dry ton. Another commenter (70.1) estimated a cost of $1.4 million per year (2009 dollars) for trucking and disposal of wet sludge cake at a landfill in their geographic area based on actual costs incurred when landfill disposal was required for a short period of time. Another commenter (87.1) stated that their cost for landfilling sewage sludge has increased significantly in recent years up to the present rate of over $70 per wet ton (over $330 per dry ton) including hauling and disposal fees. Another commenter (93.1) stated that the cost for land filling its sludge would be $57.70 per wet ton based on the disposal options available

and costs applicable within this region (2010 costs). The commenter (93.1) stated that at current processing rates, the city's landfill costs would be $1.4 million annually if it were to abandon its SSI versus the cost of operation of the FBF at $0.8 million annually. Another commenter (97.1, 127.1) estimated that its annual cost to landfill is $9 million more than incineration. Another commenter (102.1, 116.1) said that based on typical transportation and disposal costs of ~$1,500 -$2,100 for an average truck load of 22-23 wet tons of sludge (depending on distance traveled), they would be facing annual average operating expenses in excess of $7,500,000 for landfill disposal (which does not include the capital investment necessary for truck loading systems). Another commenter (118.1) stated that they would have sent 57,635 wet tons to landfill instead of the 15,792 dry tons used in the EPA cost analysis; and their landfill disposal costs are twice what were used in the EPA estimate (actual cost for landfill is $84.56/ton (wet ton), while the analysis used $41/ton). One commenter (49.1) estimated costs for landfilling based on a local city landfill fee of $87/wet ton (~$111,500,000/yr) and the use of high solid centrifuges to get dry biosolids of 28% TS ($142,000,000/yr); the commenter (49.1) stated that upgrading incinerator air pollution controls may be less expensive. One commenter (96.1) stated that the memo "Cost and Emission Reduction of the MACT Floor Level of Control" (dated June 2010) estimates their MSD's solids production at 84,480 dry tons per year, while their actual production is approximately 53,655 dry tons per year (5-year average). The commenter (96.1) stated that the memo under-estimates the actual cost for landfill disposal at $3.7M when the actual landfill disposal cost would approach $9.3M. The commenter (96.1) also noted that the MSD estimated landfill costs are based on actual hauling and disposal rates and have not been inflated to account for potential future cost increases associated with having to procure multiple sources of disposal. One commenter (115.1) spoke about a June 13, 2008 flood that severely damaged the multiple hearth incinerator and many other processes. The commenter (115.1) stated that without incineration as a primary sludge disposal option during flood recovery, their facility experienced additional operational expenses at a rate of $7M per year on a total budget of $30M. One commenter (81.1) stated that during incinerator upgrades to achieve compliance with the Part 503 regulations, sludge was disposed by landfilling and the associated trucking and disposal cost were more than twice that of incineration.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. Table 14 of the preamble to the final rule summarizes the revised costs and impacts of this alternative, if small

entities choose to landfill rather than incinerate sewage sludge. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: Several commenters (61.1, 88.1, 132.1, 136.1) expressed the belief that due to underestimated costs, the Proposed Standards would result in wastewater utilities bypassing incineration and simply sending material for disposal at a landfill. Another commenter (75.1) stated that the proposed regulations would have a "severe negative impact" on already limited disposal options and would threaten facilities' ability to treat wastewater effectively. Some commenters (65.1, 101.1, 126.1) argued that the cost to haul and landfill is based on competition with the facilities that burn and disagreed with EPA that it is cheaper to landfill sludge. These commenters (65.1, 101.1, 126.1) stated that facilities continue incineration because it is presently cheaper than landfill or other options, noting that, historically, the usage of SSIs has fluctuated with the cost of landfilling, which increased when available space decreased. These commenters (65.1, 101.1, 126.1) stated that many sites are now regional facilities burning sludge from neighboring communities, and that eliminating these regional incinerators would increase cost to existing, non burning facilities who must haul further. Another commenter (131.1) stated that landfill space is a limited resource; and if landfill disposal became the predominant method, costs would undoubtedly increase further. One commenter (61.1) is concerned about the increase in landfill tipping fees to dispose of sewage sludge.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is

often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: Some commenters (129.1, 138) argued that EPA substantially underestimated the number of trucks required to haul the sludge to municipal solid waste landfills and the truck emissions. One commenter (129.1) stated that each truck can only hold 15 - 20 wet tons of sludge due to the 80,000 pound road loading limitations. The commenter (129.1) also noted that some states require the sludge to be lime stabilized before it can be land filled; requiring trucks to haul in lime and increase the number of trucks required and truck emissions. The commenter (129.1) stated that land filling all of the sewage sludge from one of their facilities starting in 2013 would require approximately 10,500 truck loads per year, making a 130-mile round trip to the closest current landfill, and would annually cost their customers $9 million more than incineration. One commenter (73.1) also stated that EPA should be well aware that sewage sludge tendered by the municipalities to landfills are typically between only 20% to 25% solids, making transportation costs significant when considering the amount of water (as contained in the material) being hauled along with the sewage sludge.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

20.2 Landfill Availability Concerns

Comment: Several commenters (61.1, 68.1, 107.1, 71.1, 73.1, 76.1, 83.1, 89.1, 90.1, 93.1, 97.1, 127.1, 106.1, 109.1, 110.1, 111.1, 117.1, 105.1, 103.1, 107.1, 115.1, 120.1, 121.1,

64.1, 68.1, 70.1, 129.1, 134.1, 102.1, 116.1, 138, 94.1) are concerned about the availability of a landfill to a POTW including landfill capacity and/or the long haul distances and truck traffic that may be required. One commenter (68.1) stated the EPA appears to have assumed that landfills are readily available to all POTWs, and was concerned because landfills are found few and far between in most of the north eastern Unites States. Another commenter (107.1) is concerned about whether EPA considered the distances involved and the total number of vehicle miles required annually to transport sewage sludge to a landfill. One commenter (71.1) stated that their landfill is approximately 50 miles away round trip. Another commenter (90.1) stated that sewage sludge has to be mixed with other wastes when being placed into a landfill cell, for stability purposes, and landfills have daily limits on the total quantity of waste that they can manage. Another commenter (97.1, 127.1) stated that they would need to dispose of an additional 600 tons per day of sewage sludge that is 75 percent water after pressing/dewatering, and that their closest landfill (65 miles away) will not be able to handle all of its sludge and they have not been able to identify a landfill that will accept the necessary volume or type (wet) of biosolids. Other commenters (67.1, 105.1) stated that there is insufficient landfill capacity in CT for disposal of wastewater treatment plant sludge, which would necessitate trucking of sludge to out-of-state landfills. One commenter (110.1) asserted that EPA did not take into consideration the scarcity of landfills capable of accepting large quantities of sewage sludge. One commenter (105.1) is concerned that if they were to abandon incineration it could result in approximately 80 to 100 trucks per week hauling sludge out of the state; and the Connecticut DEP has expressed significant concerns with the additional truck traffic in the state since Connecticut has been classified as non-attainment for ozone. Another commenter (106.1) stated that they would need to send out more than one truck per hour, 24 hours a day, 7 days a week. Two commenters (111.1, 117.1) stated that the landfill that is willing to accept their biosolids is 270 miles away. The commenters (111.1, 117.1) asserted that a container would sit in our parking lot to be hauled away each day by the company managing the landfill; the container would be hauled by semi truck to downtown Seattle, where it would be put on a rail car and taken to the landfill by train. One commenter (103.1) is concerned that landfill stabilized sludge from their facilities would require 24,000 truck shipments per year, or 96 loads per weekday. Another commenter (120.1) stated that there is not enough landfill capacity within a 100-mile radius to handle their average of 188 wet tons/day of dewatered sludge. The commenter (120.1) stated that at the current cost of $80.00 per wet ton, the cost to landfill all of their dewatered sludge would be approximately

$5.48 million per year (this is in comparison to an estimated cost of $1.75 million per year for the incinerating the same volume of dewatered sludge). Another commenter (121.1) said that it is approximately 70 miles round trip for them to the nearest landfill and would result in 850 truck loads per year and close to 60,000 miles of truck travel. Another commenter (58) stated that the state of New Jersey would need to allow additional landfills to open to provide competition in the market, in order to avoid price gouging by the limited existing landfills and haulers. One commenter (64.1) performed an analysis of existing landfills that are used by current New Jersey authorities, and reported that the closest available landfills being utilized are in Ohio and Virginia, over 400 miles and over 300 miles away respectively. One commenter (68.1) stated that landfills are remote and available opportunities for land application are essentially nonexistent in southern New England. The commenter (68.1) stated that sewage sludge combustion is the only cost-effective alternative open to southern New England, and in turn, they are about the only option available to the nearly twenty other Massachusetts and New England communities they provide solids management to. One commenter (70.1) stated that trucking sludge from the northeast corner of New Jersey across the entire state to landfills in Pennsylvania (the closest disposal location) would be prohibitively expensive and an inappropriate environmental approach. Another commenter (73.1) stated that if the SSIs operated by Synagro and others in Rhode Island, Massachusetts and Connecticut, were shut down, the result will be approximately 3000 wet tons per day of sewage sludge being hauled hundreds of miles to landfills outside of the Northeast due to the lack of local landfill capacity to manage this material. One commenter (67.1) is concerned because their district has no other options because there are no longer any feasible environmentally friendly, cost-effective sludge disposal options in Connecticut. The commenter (67.1) estimated that the cost to truck its dewatered sludge to another incinerator is estimated at $2 million per year, and to an out-of-state landfill it is estimated at $4 million per year: seven trailer trucks per day, seven days per week. The commenter (67.1) stated that two years of landfilling exceeds the costs of these additional emissions control systems arguing that it is obvious that landfilling sewage sludge at an out-of-state landfill is not a more economically advantageous option to operating their SSI. Another commenter (81.1) stated that during recovery from a 2009 500-year flood disaster, landfill disposal of sludge was utilized exclusively, which not only increased costs but also presented capacity limitations on the sludge disposal quantities.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. EPA recognizes that the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

20.3 Odor Concerns

Comment: Several commenters (96.1, 106.1, 107.1, 109.1, 132.1, 97.1, 127.1, 138) are concerned about the odor that will be created by hauling and/or land filling sewage sludge. One commenter (96.1) stated that the memo titled "Cost and Emission Reduction of the MACT Floor Level of Control" dated June 2010 fails to consider the negative social impact of a hauling and landfill alternative to incineration. The commenter (96.1) stated that it currently sends approximately 15% of its solids to a landfill and occasionally receives complaints regarding odors emanating from tractor trailers hauling the material; the landfill owner and operations staffs have expressed resistance at accepting even this amount of sludge due to odor issues and other concerns. The commenter (96.1) is concerned the landfill will not accept anymore volume and they will be forced to find multiple sources of disposal sites, some of which are located well outside our metropolitan area, requiring longer drives. One commenter (107.1) stated that nearby landfills are not interested in taking all of the sludge produced at their facilities due to odor concerns and the potential for landfill instability. Another commenter (106.1) stated that there is not one community or transportation route that is going to tolerate for very long the volume of smelly truck traffic required get all of this sludge to a landfill. Another commenter (132.1) stated that they have experienced bans from local landfills due to biosolids odor, forcing them to use landfills at greater distance to the facility (adding to their disposal cost when incineration was not available due to scheduled or unscheduled shutdowns). Conversely, one commenter (129.1)

stated that their incinerator capacity allows for the immediate processing of all of its sewage sludge without significant storage thus reducing odors.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. EPA recognizes that the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

20.4 State Land Filling Regulation Concerns

Comment: Some commenters (75.1, 71.1, 110.1, 107.1) are concerned about the additional costs for specific State land filling regulations that EPA did not consider. One commenter (75.1) stated that Pennsylvania Code Chapter 273 Section 513 requires that sewage sludge be treated with one of the processes to meet Class B pathogen requirements as well as vector attraction reduction before being accepted by a landfill. One commenter (71.1) is concerned that Virginia regulations require that all sewage sludge must be lime stabilized before it can be accepted at a landfill. The commenter (71.1) estimated $2 million per year for lime stabilization and hauling (excluding the cost of installing a lime silo, pug mill, conveyors, sludge storage, etc.). Another commenter (121.1) also mentioned they would need to add lime or other chemicals to the sludge as part of the process to meet stabilization requirements, which in turn also adds to the weight of solids disposed at a landfill. Other commenters (101.1, 110.1, 67.1, 117.1) are concerned about State and local regulations that are in place to restrict land filling of sewage sludge. One commenter (107.1) pointed out that in the State of Washington land filling of sewage sludge is currently permitted only in emergency circumstances. Another commenter (110.1) pointed out that in California and other states there are statutory requirements to divert organic material like sewage sludge away from landfills. One commenter (67.1) stated that a major factor limiting wastewater sludge management options in Connecticut are regulatory

constraints which make land application and composting unfeasible. The commenter (67.1) stated that there are no regional landfills left in Connecticut, Massachusetts and Rhode Island that can accept wastewater sludge. Another commenter (117.1) stated that their State policy considers sewage sludge not a solid waste. One commenter (68.1) stated that they invested in a combustion system based on the set of regulations that were in place under part 503 standards and on Massachusetts air pollution control standards. The commenter (68.1) argued that their investment was intended to provide a long term solution for sewage sludge management in central Massachusetts where there are very few alternative management options.

Some commenters (101.1, 126.1) stated that land filling (of sewage sludge) is illegal in New Jersey and there is limited space available for land application. One commenter (64.1) referred to New Jersey's Statewide Sludge Management Plan and stated that it is the Department's Policy to prohibit the landfill disposal of sewage sludge because land filling is a land-intensive waste disposal mode which commits land areas for the foreseeable future. The commenter (64.1) stated that the plan does permit landfill disposal of sewage sludge only on a short-term basis under limited overriding circumstances as determined by the Department under the terms of an Administrative Consent Order. In addition, the commenter (64.1) pointed out that it is the Department's Policy that sewage sludge thermal reduction facilities are an integral and necessary part of the State's diversified sewage sludge management strategy; dedicated sewage sludge thermal reduction facilities impart a vast volume reduction on the sewage sludge introduced into the facilities, do not require significant land commitment for disposal, operate in all seasons, safely manage one quarter of the State's sewage sludge production without nuisance, and are fully regulated by the Department's Air Pollution Control Program.

Response: EPA thanks the commenters for their input. EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. EPA recognizes that the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. We incorporated data provided by commenters on the availability of landfills in our assumptions on trucking distances. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic

constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

20.5 Additional Expenditures and Site Constraints

Comment: Some commenters (83.1, 90.1, 93.1, 94.1, 96.1, 97.1, 127.1, 115.1, 121.1, 129.1, 134.1, 102.1, 116.1, 138) are concerned that EPA did not consider the need for additional capital and/or infrastructure expenditures for on-site storage, odor control, materials handling, truck loading, etc. One commenter (83.1) is concerned about pad storage to house materials until they can be sent to the landfill—if storage on-site is even an option given the footprint of the facility. One commenter (102.1) noted that wastewater treatment plants operate 24/7/365, while landfills typically operate on a more traditional 8 hours/day – 5 day/week schedule. Another commenter (115.1) noted that the additional operational expenses (such as storage options) would be necessary to address the fact that landfills are open only 5 or maybe 5.5 days per week and sludge is generated 7 days per week regardless of weekends, winter, or prolonged wet weather. Another commenter (93.1) stated that it would need to abandon its SSI and add anaerobic digestion or similar process to produce a biosolids product resulting in capital expenditures in the tens of millions of dollars and increased operating costs. Another commenter (94.1) stated that their 2-story, 13,860 sq. ft., incineration building was erected in 1995 and is valued at $12,000,000 dollars; their process includes state-of-the-art emissions controls valued alone at over $700,000 which does not include a separate odor control tower and associated equipment as well as a 140' by 160' poured concrete ash settling basin. Another commenter (96.1) stated that the memo significantly under-estimates the capital cost associated with constructing load-out and odor control facilities for a landfill disposal operation. Other commenters (97.1, 127.1, 129.1) stated that there would be additional costs, estimated to cost over $50 million, for a loading and storage facility that can accommodate up to 12 trucks per hour for their facility. The commenter (97.1, 127.1) argued that these additional costs are difficult to justify when they do not reduce emissions and they eliminate the opportunity to use sewage sludge as a viable alternative energy source for electricity and steam generation. One commenter (121.1) stated that their facility will need to be retrofitted for additional dewatered sludge conveyance and storage, loading facilities, and due to the high volume of sludge to be transported, supplementary sludge hauling equipment (trucks) would also be required. Another

commenter (129.1) stated that in order to land apply their sewage sludge, a new alkaline stabilization facility would have to be constructed, since their facility does not have digesters, nor does it have the room to construct digesters. The commenter (129.1) stated that land application of an alkaline stabilized Class A product would require 13,700 - 14,700 truck loads per year, making a round trip of at least 150- miles to land application sites and would annually cost customers $ 10 - 11 million more than incineration. Another commenter (134.1) was also concerned that EPA has not taken into account the cost for stabilization and on-site storage of dewatered solids. The commenter (134.1) stated that many landfills require stabilization that will require the addition of digestion, thermal drying, or lime stabilization that will greatly affect the capital and operating costs.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). The revisions include updated costs for storage and waste management equipment. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: Two commenters (111.1, 117.1) are concerned about site constraints because there is no location within their plant to construct a sludge loading area for a container, and the facility is hemmed in on all sides. Another commenter (129.1) said that their three WWTPs do not have the available land space to construct facilities to store liquid and dewatered sewage sludge. The commenters (111.1, 117.1) stated that the only location for a sludge container would be in the parking lot with employee and visitor cars. The commenters (111.1, 117.1) stated that even if it was determined acceptable to leave a huge container in the middle of the parking lot every day for the life of the facility, scheduling the hauling of the container makes the idea impractical (as the container would need to be removed daily to keep up with sludge production, including weekends and holidays). The commenters (111.1, 117.1) pointed out that on days when snow and ice would prevent the hauler from removing the container, the City has no means

of moving the massive containers, and no place to move it to until the road conditions improved for the contract hauler to pick it up. The commenters (111.1, 117.1) asserted that choosing to rely on moving sludge containers from the only parking lot in the plant for the next 50 years causes an unacceptable amount of liability and risk to the City.

One commenter (117.1) stated that as a small utility serving a population of 50,000, they would significantly impacted by the proposed standards. The commenter (117.1) stated that they would be required to add additional equipment to remove the small amount of mercury and other listed contaminants that pass through our incinerator, as well as provide additional staffing and training to maintain the equipment and prepare the required reports. The commenter (117.1) stated that due to the geography of their location, access to the facility is limited by a long, narrow, winding and steep driveway (making trucking unreliable), and that the site is completely built out with little room to add additional processes or equipment. The commenter (117.1) asserted that these challenges make the options of trucking sludge to a landfill or drying sludge not viable. The commenter (117.1) also noted that the sludge produced at the facility is wet (~ 24% solids), not easily transported, and not accepted at any landfill within a hundred mile radius.

Response: EPA thanks the commenter for their input. EPA recognizes that the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. We have also revised the final emission limits and impacts analysis. Additionally, we are not selecting any beyond-the-floor options for the final rule. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

20.6 Greenhouse Gas Emissions and Environmental Concerns

Comment: Several commenters (96.1, 97.1, 127.1, 129.1, 102.1, 116.1, 138) argued that incineration actually produces much less greenhouse gas emissions than land filling. One commenter (129.1) stated that for a number of pollutants, the environmental burden is lower with

on-site incineration of sewage sludge than with additional processing and off site management. One commenter (96.1) provided a table showing that greenhouse gas production for a landfill option will be 4 times greater than for MHF incineration, and 9 times greater than for FB incineration. The commenter (96.1) argued that greenhouse gas emissions will be significantly greater due to the volume increase from hauling, and methane release from cake solids applied to a landfill has 21 times the greenhouse gas forming potential of carbon dioxide. One commenter (85.1) argued that EPA did not consider environmental impacts and consequences of land filling sewage sludge. Another commenter (129.1) asserted that land application and land filling may actually result in higher emissions than those produced during incineration because of the distances sewage sludge must be transported. The commenter (129.1) provided a table containing air emissions from three incinerators and trucks used to transport the sludge to landfill or land application sites; the table shows that emissions of carbon monoxide, oxides of nitrogen, sulfur dioxide and organics from three new fluidized bed incinerators being constructed at a WWTP will be lower or equal to the emission levels from land application and land filling. One commenter (75.1) reasoned that the potential harm to the environment would be greater than the air quality improvements to be achieved. Another commenter (102.1, 116.1) said that the carbon footprint is likely to be much larger for landfill disposal than the incineration process. Another commenter (138) stated that for their multiple hearth incinerators, greenhouse gas emissions equate to 7,300 ton equivalents, and land filling would generate 27,000 ton equivalents.

One commenter (128.1) argued that the transport of sewage sludge for land application and land filling creates additional vehicle emissions, and the increased sewage sludge in landfills generates added methane emissions. Commenters (97.1, 127.1) stated that air emissions associated with trucking sewage sludge to landfill exceed the air emissions from incineration, and asserted that additional environmental benefits accrue when incineration is used to generate steam and/or electricity that offsets the need to burn fossil fuels. The commenters (97.1, 127.1) stated that incineration was the "greener" option for their POTW, and provided a comparison of estimates of criteria emissions from truck traffic and incineration. One commenter (107.1) expressed concerns about the anaerobic decomposition of hundreds of thousands of tons of sewage sludge because it is going to generate significant quantities of gasses, which the commenter stated would add to the deleterious effects on the atmosphere of the fuel burned to transport the sludge. Other commenters (107.1) argued that the effect on human health of the all of the vehicle emissions that will be produced to transport hundreds of thousands of tons of

sludge, hundreds of thousands of miles annually needs to be compared against the actual reduction of pollutants emitted by the SSIs.

One commenter (128.1) stated that incineration is a more cost-effective option for many communities; and produces environmental benefits by reducing odors from storage and loading, destroying pathogens at high temperature, and by displacing fossil fuel otherwise needed to generate steam and increasingly to produce electricity. One commenter (73.1) stated that high temperature associated with incineration ensures the destruction of pathogens, odors, other organic compounds in the sewage sludge. Another commenter (76.1) argued that EPA has not considered the potential GHG emissions that will occur if all the sludge currently incinerated is suddenly placed in a landfill or land applied. The commenter (76.1) stated that incineration has been shown by Metropolitan St. Louis Sewer District as the least GHG producing method of disposal. The commenter (76.1) stated that they recycle methane gas from a closed landfill in combination with the plant generated sludge as energy sources in the MHF process. The commenter (76.1) stated that heat created in this process is utilized to create enough steam necessary to provide oxygen to the microbes in the biological treatment process at the plant, essentially removing load from the power grid. The commenter (76.1) urged EPA to consider if the proposed limits are reasonable from a non-air quality standpoint and if the limits are reasonable considering energy requirements such as truck hauling and the associated GHG emissions from surface placement of methane producing sludge to determine if landfill placement is a viable alternative to incineration.

One commenter (125) argued that EPA should encourage the use of sewage sludge as a renewable energy to combat climate change. The commenter (125) asserted that even the most efficient landfill gas systems are predicted to capture only 90% of the generated landfill gas; and older gas collection systems are predicted to capture only 75% of the created landfill gas. The commenter (125) stated that methane emissions are 21 times more harmful than carbon dioxide based on their global warming potential; and argued that the method of thermal processing biosolids would have a net environmental benefit [compared to land filling]. The commenter (125) added that if local thermal processing facilities could be used to treat sewage sludge as opposed to land filling, there would be a reduction in truck emissions because some of the landfills used by Southern California waste water treatment plants are located hundreds of miles away in Arizona or Kern County. One commenter (134.1) requested that EPA include both

fugitive and captured landfill gas emissions in its comparison emission calculations. The commenter (134.1) stated that the effect on GHG emissions should not be ignored.

Response: At proposal, we evaluated landfilling as an alternative disposal method. We have revised our costs and impacts of this alternative based on comments received on the proposal and corrections made to the analysis. We have also revised the final emission limits and impacts analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). Additionally, we are not selecting any beyond-the-floor options for the final rule. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (112.1) stated that land filling was identified as the least-preferred disposal option in the Solids Treatment and Utilization Master Plan (STUMP), drafted in 2009. The commenter (112.1) pointed out that the STUMP identified incineration as an essential component of the future biosolids management program for the City of Columbus, Ohio, Department of Public Utilities. The commenter (112.1) stated that the STUMP was developed with guidance from agricultural, commercial, and utility stakeholders and utilized a comprehensive material flow optimization framework to optimize operations to minimize cost, energy usage, and GHG emissions. Another commenter (73.1) argued that land filling of a valuable, recyclable material runs contrary to the mandates of many jurisdictions seeking to meet both landfill diversion and greenhouse gas emission goals by reducing their volume of waste being disposed of in landfills as they are faced with decreasing amount of available landfill space.

Response: EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. We have revised our costs and impacts of this alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). Additionally, we are not selecting any beyond-the-floor options for the final rule.

Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (129.1) is concerned that the proposed rule could have a significant impact on energy supply, distribution or use. The commenter (129.1) stated that if POTWs are forced to shut down their incinerators and haul their sludge to a landfill, the use of diesel fuel will significantly increase since the trucks average four (4) miles per gallon. As a result, the commenter would specifically use a minimum of 350,000 gallons of diesel fuel to transport its sludge to landfill and a minimum of 600,000 gallons of diesel fuel to transport the Class A product to land application sites. The commenter (129.1) stated that this does not include the diesel fuel that would be used by the trucks required to haul lime from the quarries to our plants or carbon from the processing plants to our plants.

Response: EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. We have revised our costs and impacts of this alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). We have revised the fuel emission limits and impacts analysis. Additionally, we are not selecting any beyond-the-floor options for the final rule. Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

20.7 Other

Comment: Several commenters (58, 63.1, 68.1, 69.1, 70.1, 74.1, 78.1, 81.1, 87.1, 94.1, 101.1, 103.1, 105.1, 106.1, 111.1, 113.1, 114.1, 115.1, 118.1, 120.1, 126.1, 129.1, 132.1, 138, 72.1, 76.1, 90.1 93.1, 61.1) stated that selection of a management option for sewage sludge is a

local decision […] based on environmental protection concerns, community needs, geographic constraints, economic conditions and many other considerations. Other commenters (105.1, 137.1) stated that EPA should evaluate the various disposal options on a regional basis because costs vary by location and region. These commenters (105.1) stated that in the Northeast, landfills are generally much more expensive than other areas of the country, do not have the long term capacity, and they are not always located close to facilities with SSIs. Commenter (101.1, 126.1) argued that incineration is the environmentally appropriate, as well as, cost effective manner in which to dispose of sewage sludge. One commenter (71.1) stated 80 percent of the wastewater treated at their facility originated from industrial sources, noting that because of the high industrial mix of their wastewater, incineration was chosen as the best management option for sludge. A number of commenters (75.1, 78.1) stated they maintain multiple options for sewage sludge disposal such as incineration, land application, and land filling. One commenter (138) added that they incinerate about 85 percent of their solids, but did not indicate how they handle the balance. One commenter (134.1) requested that EPA confirm that the "haul to landfill" option was only used as an example, and that wastewater plants need to select the solids management practice most effective for their local conditions.

Response: EPA recognizes the selection of a management option for sewage sludge is often a local decision. EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). The revisions included storage, mileage, and cost data provided by commenters.

Comment: One commenter (73.1) stated that the incineration process results in a 90 - 95% reduction in volume and the production of a non-hazardous, non-toxic, ash that is beneficially reused throughout the U.S. Another commenter (138) provided information about their cost benefits for ash reuse. The commenter (138) stated that with their land application permit, they are able to save about $400,000 over a three year period as their costs for ash reuse is $134,000 over a three year period while land filling is estimated to cost them $534,000 over a three year period. One commenter (110.1) believes more consideration should have been given to land application as an alternative option.

Response: EPA thanks the commenter for their input. Our revisions to landfill impacts include revisions to transportation and storage needs, which would be applicable to land treatment. Table 14 of the preamble to the final rule summarizes the revised costs and impacts of this alternative, if small entities choose to landfill rather than incinerate sewage sludge. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). Based on the revised impacts, it is unlikely that many sources will find landfilling an appropriate alternative. However, the selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, EPA recognizes that for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (64.1) disputed USEPA's assumption that "incineration continues to be utilized to dispose of sewage sludge, but is increasingly becoming less common." The commenter (64.1) stated that in New Jersey, for calendar year 2009, management by sewage sludge incineration accounted for about 24 percent of the state's sludge production (the total amount of sludge managed via sewage sludge incineration in 2009 was over 52,000 dry metric tons), and this was an increase over 2008 when about 21 percent of the state's sludge production was managed via incineration, and only a slight decrease from ten years ago when about 26 percent of the state's sludge production was managed via incineration. The commenter (64.1) stated that there are eight sewage sludge incinerators operating in the State, and there are an additional 107 domestic treatment works that rely on these incinerators for sewage sludge disposal. The commenter (64.1) is concerned that a potential loss of one-quarter of the state's current sludge disposal alternatives (and a much larger percent of the state's available capacity) could have potential negative economic impacts beyond the eight operators of sewage sludge incinerators. The commenter (64.1) urged the EPA to carefully consider all costs and the benefits derived, versus the potential negative consequences, prior to finalizing the proposed rule.

Response: EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option provided. EPA has considered commenters' concerns and revised the cost and impacts analysis accordingly. Table 14 of the preamble to the final rule summarizes the revised costs and impacts of this alternative, if small entities choose to landfill rather than incinerate sewage sludge. A detailed discussion of the landfilling alternative analysis is provided in the

memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). Based on the revised impacts (as discussed above), it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: Some commenters (65.1, 101.1, 126.1) are concerned about the debt that some SSI systems may have to continue pay even though the equipment would be no longer in use (should the site be required to landfill sludge). The commenters (65.1, 126.1) provided an example where a site with a new renovation would still have to repay the $5,000,000 debt to the State and bondholders even if it were forced into land filling the sludge.

Response: EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. For some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (102.1, 116.1) asked how any insurance carrier or municipality will predict and account for the liabilities of over the road transportation accidents where sewage sludge will inevitably be discharged onto ground and water surfaces.

Response: EPA is not requiring landfilling and did not require it in the NPRM; it is an alternative option evaluated. We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). The revisions included storage, mileage, and cost data provided by commenters. Based on the revised impacts (as discussed above), it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (82.1) stated that if facilities decide to switch to landfilling or land applying sludge as a result of this rule, they would also benefit from technical assistance in setting up a new program for sludge disposal.

Response: We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). Based on the revised impacts (as discussed above), it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

21.0 RELATIONSHIP TO CAA SECTIONS 112(C)(3) AND 112(K)(3)(B)(II) (AREA SOURCES)

Comment: One commenter (84.1, 119.1) agreed with EPA's conclusion that the Clean Air Act unambiguously requires it to set §129 standards for SSI (see 75 Fed. Reg. at 63263-63264). The commenter (84.1, 119.1) stated that the agency's previous attempts to avoid setting such standards contravened §129's mandate to set §129 standards for all solid waste incineration units and definition of such units to include any facility that burns any solid waste material at all other than those types of unit that § 129(g)(1) expressly excludes. The commenter (84.1, 119.1) stated that if EPA did not set §129 standards for SSIs, the agency would leave a major category of polluters without necessary controls. The commenter (84.1, 119.1) argued that few, if any, SSI are "major" sources for the purposes of §112, even though EPA's baseline emissions estimates show that SSI are dangerous toxic polluters both as a category and individually; therefore, attempting to regulate SSI under §112 instead of §129 would not only be flatly unlawful but would leave these polluters operating without meaningful control, monitoring and reporting requirements. The commenter (84.1, 119.1) stated that it is precisely because all incinerators – including SSI – are so dangerous, that the Clean Air Act §129 requires MACT standards and Title V permits for all incinerators. The commenter (84.1, 119.1) argued that EPA's GACT standards (for sources that are not "major" for §112) have achieved only minimal reductions in emissions, and exempting sources from Title V permitting would deprive neighboring communities of the benefits Title V permits provide; citizens in those communities would be unable to learn the identity and quantity of the toxic emissions to which they are being exposed by a specific facility, and to determine whether that facility is in or out of compliance with its emission standards. The commenter (84.1, 119.1) purported that industry groups are effectively seeking to avoid any meaningful obligation to control, monitor, or report their toxic emissions – a position that is both devoid of legal merit and deplorable. The commenter (84.1, 119.1) agreed with EPA's rejection to the industry group's arguments regarding this issue, and incorporated by reference the response comments on EPA's previous SSI proposal (see August 14, 2006 Comments of Earthjustice and Sierra Club).

Response: EPA thanks the commenter for their input.

22.0 RELATIONSHIP TO OTHER SSI RULES FOR THE USE OR DISPOSAL OF SEWAGE SLUDGE

Comment: Several commenters (64.1, 82.1, 134.1) noted that establishing the proposed rule under 40 CFR part 60 would subject SSIs to two sets of requirements (numerical standards, operational standards, monitoring, recordkeeping and reporting) under both the Clean Water Act (40 CFR Part 503) and the Clean Air Act (40 CFR Part 60). One commenter (64.1) noted, as acknowledged in the proposed rule, that the emission limits for inorganic pollutants under Part 503 are risk-based numbers, while the Clean Air Act MACT standards are technology-based, and created an additional burden for these facilities. Several of these commenters (64.1, 82.1, 110.1) requested that EPA coordinate and consolidate the rule processes prior to finalizing the proposed rule, in order to reduce the burden on facilities, reduce conflict between rules, and to minimize risk from the incineration of sewage sludge.

Response: As the commenter noted, EPA acknowledged the differences between the part 503 regulations and the proposed standards in the NPRM, and discussed the potential impacts to current SSI facilities that may arise because they are regulated under both part 503 and the proposed standards. Based on a revised analysis for the final rule, we still expect that the regulation of sewage sludge under CAA section 129 would result in stricter emission standards than under the current CWA rule. EPA plans to evaluate the requirements under the CWA to determine what changes, if any, should be made to the part 503 regulations.

Comment: One commenter (48.1) stated that POTWs are subject to numerous regulations with recordkeeping and reporting requirements including permits on effluent discharge, air discharge, and site stormwater. The commenter (48.1) stated that EPA must consider that numerous unfunded mandates continue to be developed for the industry in a time of economic hardship. The commenter (48.1) stated that the proposed rule needs to be coordinated in concert with funding mechanisms in order for utilities to meet the mandated activities. The commenter (48.1) also stated that in order to abandon the use of multiple hearth incinerators, a seven year period from the start of a Request for Proposals would be realistic.

Response: EPA thanks the commenter for their suggestions and concerns however this rule does not contain a federal mandate that may result in expenditures of $100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, this final rule is not subject to the requirements of sections 202 or 205 of UMRA. This

final rule is not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. Because this final rule's requirements apply equally to SSI units owned and/or operated by governments or SSI units owned and/or operated by private entities, there would be no requirements that uniquely apply to such government or impose any disproportionate impacts on them. EPA believes that all existing SSI units will choose to comply with the final rules and the timeline for compliance is realistic.

Comment: Some commenter (134.1) stated that the proposed rule is redundant. One commenter (134.1) stated that all of the pollutants covered by the proposed regulation have been adequately managed under the limits and technological requirements of the EPA 503 regulations, coupled with NESHAPS, NSPS and parallel regulations in individual jurisdictions. The commenter (134.1) stated that a full complement of data needs to be collected and a valid cost-benefit analysis needs to be conducted with these regulations considered. Other commenters (135.1, 129.1) noted that SSIs are currently regulated under 40 CFR part 503, NSPS 40 CFR part 60 subpart O, the mercury and beryllium NESHAPS, and state permit requirements, and must comply with site specific limits for arsenic, cadmium, chromium, lead, and nickel. One commenter (129.1) requested that EPA adhere to the Part 503 program, stating that the Part 503 regulations are risk based and therefore protective of human health and the environment. Another commenter (135.1) stated EPA should consider consolidation or vacating redundant rules that complicate compliance, stated that these rules would no longer provide an additional environmental benefit for regulated facilities. One commenter (51.1) specifically requested if facilities would be subject to the proposed rule and 40 CFR 60, Subpart O following promulgation, or if the proposed rules would replaced Subpart O.

Response: EPA disagrees that regulation of SSI units under section 129 is unnecessary because SSI units are already regulated under section 405 of the CWA. As explained in section VI of the preamble, the final rule will achieve reductions of the section 129 pollutants from SSI units. Please see Section V.A of the preamble for a more complete discussion of these issues.

Comment: One commenter (129.1) stated that there are a number of POTWs that practice incineration that are located in areas that are not in attainment with the Clean Air Act requirements for particulate matter, ozone, oxides of nitrogen or sulfur dioxide. The commenter (129.1) noted that these POTWS are required to limit the emissions of the pollutants and their precursors, and expressed concern that the proposed rule would add an additional burden as these

units would be subject to a significant number of differing Federal, State and local emission limits.

Response: Section 129 of the CAA requires EPA to emission standards for SSI units. Section 129 standards do not allow EPA to differentiate between sources in non-attainment and attainment areas. However, we have tried to reduce the burden of complying with the final standards by allowing less frequent testing and minimizing monitoring, recordkeeping and reporting requirements, to what we believe to be necessary to assure compliance with the final emission limits.

Comment: One commenter (134.1) specifically stated that the 503 regulations use total hydrocarbons (THC) or carbon monoxide (CO) as a surrogate for complete combustion, whereas the proposed regulations require both THC and CO continuous emission monitors for existing multiple hearth SSIs. The commenter (134.1) requested that EPA resolve this conflict prior to promulgation, and not after, as discussed in the preamble to the proposed rule.

Response: In the final rule, we are not incorporating the alternative THC compliance requirement. Section 129 requires that limits be set for each of the 9 regulated pollutants. Surrogates, such as THC, cannot be used in place of the regulated pollutants.

Comment: One commenter (97.1, 127.1) stated that under the Clean Water Act, POTWs maintain the power to choose a residual management option that best meets the needs of the local community. The commenter (97.1, 127.1) suggests that, likewise, EPA should use the authority Congress granted under Section 112 of the CAA to regulate the remaining HAP in a way that preserves incineration as a viable residuals management option.

Response: EPA thanks the commenter for their input. EPA is not requiring landfilling and did not propose to require it in the NPRM. However, EPA did analyze the costs and impacts of landfilling as an alternative option used for sludge disposal. We have revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). The revisions included storage, mileage, and cost data provided by commenters. Based on the revised impacts (as discussed above), it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full

evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

EPA has also revised the final limits, and after revising the emissions data set and associated default parameters based on data corrections submitted during the comment period, EPA has revised its cost estimates for MACT and beyond-the-floor control options. Please refer to the memoranda "Revised Cost and Emission Reduction of the MACT Floor Level of Control" and "Revised Analysis of Beyond the Maximum Achievable Control Technology (MACT) Floor Controls for Existing SSI Units" (EPA-HQ-OAR-2009-0559) for details). Consequently, emission reduction estimates and cost-effectiveness were also re-evaluated for the MACT floor and beyond-the-floor options. Additionally, EPA has re-evaluated the applicable control options for each pollutant. Based on these results, EPA has decided not to go beyond-the-floor for any of the pollutants.

23.0 STATUTORY AND EXECUTIVE ORDER REVIEWS

Comment: One commenter (89.1) urged EPA to revise its Regulatory Impact Analysis and resubmit this document to OMB for further review under Executive Order 12866, based upon EPA's apparent miscalculation of certain costs critical to the Proposed Standards (e.g., cost for SSIs to meet the Proposed Standards and cost of landfilling). The commenter (89.1) also recommended EPA withdraw the Proposed Standards to fully consider the correct cost data.

Response: We have revised our costs and impacts to incorporate corrections to the SSI database, corrections to the calculation methodology, and revisions to the controls costed for sources to meet the final standards. We have also revised our costs and impacts of the landfill alternative based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the landfilling alternative analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559). The revisions included storage, mileage, and cost data provided by commenters. Based on the revised impacts (as discussed above), it is unlikely that many sources will find landfilling an appropriate alternative. The selection of a management option for sewage sludge is often a local decision that is based on environmental protection concerns, community needs, geographic constraints, and economic conditions. Given a full evaluation of these factors, for some sources, landfilling or land treatment may be a better management option than incineration.

Comment: One commenter (130.1) stated that EPA failed to assess the potential impacts of SSI units on the nation's Tribes. The commenter (130.1) argued that apart from the anticipated impact that the SSI Rule could have on Indian Tribes, EPA failed to adequately consult with Tribes. The commenter (130.1) stated that in making a determination as to when consultation with such Tribes is appropriate, the guiding principles for the Agency are encapsulated in Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments. The commenter (130.1) disagreed (based on its understanding of the EO) with EPA's finding that the SSI Rule does not have Tribal implications as none of the nation's 218 SSI units are owned by Tribes or located in Indian Country. The commenter (130.1) purported that EPA assumed consultation with Tribes is only required when a federal action is expected to impose substantial direct compliance costs on one or more Tribes. The commenter (130.1) stated that this is a false presumption on the part of the EPA because any federal action having Tribal

implications warrants consultation between the federal government and Tribes, particularly the regulations being put forth as part of the Rule at hand. The commenter (130.1) argued that for the EPA to limit its consultation with only those Indian Tribes owning SSI units or having SSI units on Tribal lands ignores the large number of Tribes with potential exposures to the toxins from emissions of SSI units such as mercury, lead, cadmium, hydrogen chloride, particulate matter, carbon monoxide, dioxins/furans, nitrogen oxides, and sulfur dioxide. The commenter (130.1) stated that these toxins can be carried into the atmosphere and transported great distances onto Tribal land; the toxins can also enter waterways on which many Tribes depend for their cultural and subsistence practices. The commenter (130.1) stated that fish, being one of the primary subsistence foods for a number of these Tribes, are particularly at risk to mercury, a toxin known to cause severe health risks to pregnant women. The commenter (130.1) argued that because of this and the likelihood that some of these fish will be consumed by Tribal members, the Agency must obligate itself to consult with Tribes based on this unique exposure pathway for toxins (e.g., through cultural and subsistence practices). The commenter (130.1) asserted that EPA has failed to follow the edicts of both the EO and Agency's Indian Policy, and has therefore failed to fully protect and preserve federal treaty trust resources important to Tribes such as hunting and fishing rights, with such rights considered integral to many Tribes' continued existence. The commenter (130.1) recommended EPA conduct meaningful consultation with the nation's Tribes regarding the SSI Rule.

Response: During proposal EPA was not aware of any SSI owned or operated by an Indian tribe or tribal governments, thus, Executive Order 13175 did not appear to have implications. However as specified in Executive Order 13175, (65 FR 67249, November 9, 2000), EPA has attempted to outreach and discuss possible SSI implications with tribal contacts. EPA presented information on the SSI proposal and specifically solicited additional comment on the proposed action from tribal contacts in the proposal period via the NTAA conference calls. EPA participated on two NTAA conference calls to discuss the rule development process, first to provide general information on the development of the SSI standards and second providing more specific background information on the purpose of the rulemaking, number and locations of units, and unit types. EPA allowed time for clarifying questions and requested information if any NTAA members were aware of any type of incinerator burning sewage sludge in Indian Country.

Comment: One commenter (130.1) requested EPA provide a better understanding as to the actual location of these sites so the commenter can actively engage with the federal

government and others to mitigate any and all adverse impacts that they may face from the toxins contained at such sites. Using a memo dated June 2010 entitled "Development of the Inventory Database for the Sewage Sludge Incinerator Source Category", the commenter (130.1) identified SSI units in Alaska, Michigan, New York, Washington State and Wisconsin with potential impacts from being sited near Tribal lands. The commenter (130.1) asserted that since these facilities are near Tribal lands, Tribal members have the potential to incur exposure to SSI unit emissions depending on many factors like meteorological conditions. The commenter (130.1) recommended EPA needs to give its greatest attention to these tribes (those which are impacted by off-reservation SSI unit emissions). The commenter (130.1) is concerned about how Tribes are to know if the federal government's trust responsibility has been met in the context of the SSI Rule when the Agency has failed to account for the impact of off-reservation SSI units on Tribal lands such as transport of mercury emission into fishing habitats serving as cultural subsistence sources for Tribes. The commenter (130.1) recommended that the Agency provide a map overlay that accounts for both SSI units and Tribal lands so Tribes can acquire a better understanding on how they might be affected by such sites and the Rule in general.

Response: EPA has attempted to outreach and discuss possible SSI implications with tribal contacts. EPA presented information on the SSI proposal and specifically solicited additional comment on the proposed action from tribal contacts in the proposal period via the NTAA conference calls. EPA participated on two NTAA conference calls to discuss the rule development process, first to provide general information on the development of the SSI standards and second providing more specific background information on the purpose of the rulemaking, number and locations of units, and unit types. EPA allowed time for clarifying questions and requested information if any NTAA members were aware of any type of incinerator burning sewage sludge in Indian Country. EPA will provide a map overlay for the SSI docket so that tribes can acquire a better understanding on how they might be affected by SSI sites and the standards in general.

24.0 DURATION OF COMMENT PERIOD

Comment: Several commenters (65.1, 109.1, 138) requested more time to review the proposed package. One commenter (65.1) stated that forty-five calendar days (review period: October 14 through November 29) was not enough time to perform much more than a cursory overview of the data, and needed more time to adequately review and comment in the data presented. Another commenter (109.1) requested EPA allow a minimum of an additional 45 days for the comment period stating that the source emission profiles of SSIs in POTWs are quite complicated, and significantly vary by locality, equipment configurations, operating modes, and sludge cake quality conditions. Another commenter (138) requested that EPA extend the public comment period for an additional thirty (30) days beyond November 29th. One commenter (138) said that the comment period's November 29th deadline is far too short for generating the additional data and required analysis.

Response: Given the court-ordered deadline for EPA to issue the final SSI rule, it was not possible to extend the comment period.

Comment: Some commenters (76.1, 83.1, 129.1) urged EPA to seek an extension of the court order to promulgate emission standards by January 16, 2011. One commenter (76.1) stated that serious procedural mistakes by EPA staff and major calculation errors in the technical attachments has resulted in hundreds of comments on the draft rule as well as set the stage for definite legal action. The commenter (76.1) is concerned that some significant deficiencies may have been missed that will impair them from continuing to provide incineration as the most cost effective means of sludge handling for the citizens they serve. The commenter (76.1) urged EPA to not use this deadline to justify the use of insufficient emission data, flawed emission calculations, and incorrect economic analysis in determining the MACT floor or beyond-the-floor emissions limits. The commenter (76.1) also requested EPA provide another comment period to allow the regulated community the opportunity to review a document that does not have such a massive number of errors. Another commenter (83.1) requested an explanation if EPA is not planning to seek such an extension. One commenter (129.1) argued that EPA should request additional time from the Court to properly review and revise the proposed rule because of the following reasons:

- Inaccurate assumptions made by EPA and its contractors in developing the proposed rule and the resulting incorrect determinations,

- Lack of proper consideration of the variability of the composition of sewage sludge from POTW to POTW and within a POTW from season to season and even week to week,
- Lack of a proper variability analysis on the limited amount of SSI air emissions test data that was collected during the Information Collection Request,
- Proposed new source performance standards that no new SSI will not be able to continuously meet,
- Sewage sludge is substantially different than the hospital, medical and infection wastes on which the proposed rules are based and it is not homogeneous,
- SSIs will not be able to continuously comply with the proposed operational standards and a number of the other proposed requirements,
- Major impacts that the proposed SSI rule will have on POTWs and their customers, and
- Lack of time (45-days) that the POTWs that practice incineration had to review this very complex proposed rule and the voluminous back-up information contained within the docket.

Response: EPA requested and received a 30-day extension to address public comments in the final rule. As stated above, EPA is required by court order to issue these regulations by Feb. 21, 2011. EPA has responded to the commenters concerns in the preamble to the final rule and in this response to comments document.

Comment: At least one commenter (97.1, 127.1) stated that EPA's request for additional stack test data is an inappropriate burden for sources at this stage of the rulemaking. The commenter (97.1, 127.1) stated that EPA has primary responsibility for gathering the data. The commenter (97.1, 127.1) stated that asking sources to provide additional stack test data during the 45-day public comment period undermines the source's ability to comment on the proposed options for regulation. Furthermore, the commenter (97.1, 127.1) asserts that EPA offered insufficient time to conduct the stack tests, quality assure the data and submit it for consideration.

Response: EPA's request for additional stack data was intended to encourage sources to submit any existing data as well as any other relevant data and information they were able to provide for the purpose of establishing these emissions standards. Such requests are commonly made by EPA when it proposes regulations that rely on available information, and that request

was not a requirement that sources test their SSIs. As summarized in sections 8.0 and 9.0 of this document, many commenters compared EPA's emission estimates to results from their most recent tests. While some commenters summarized their test data, no commenters provided any of the test reports on which the data were based. Without the actual test reports, which are necessary to extract information and verify tests were properly conducted using approved EPA test methods and without problems, EPA was unable to use any of the test data summarized in the comments.

Comment: Some commenters (97.1, 127.1, 111.1, 121.1, 128.1, 83.1) requested that EPA withdraw or postpone the rulemaking until additional data could be gathered. One commenter (111.1) specifically requested that EPA delay the rulemaking until two years after EPA's rulemaking regarding amalgam separators becomes effective.

Response: EPA is ordered by the Court to satisfy its obligation under CAA section 112(c)(3) and (k)(3)(B)(ii) by February 21, 2011 (Sierra Club v. Jackson; D.D.C. No. 1:01CV0153).

Comment: One commenter (48.1) stated that they do not understand why the approximately 150 municipalities to which this proposed rulemaking affects were not notified by the Agency. The commenter (48.1) said they learned of this current (and final) opportunity to comment on this action via a salesman who markets incineration emission control devices. To get commentary from the entities this proposed rulemaking directly affects, the commenter (48.1) recommended that effort be made by EPA to contact the regulated community. The commenter (48.1) stated that the regulated community makes the necessary effort to contact EPA at least annually to submit compliance reports.

Response: EPA began data collection efforts in 2009 for the SSI rulemaking, in which EPA sent an ICR to affected sources. The industry trade group, NACWA, has been aware of EPA's SSI rule and its schedule, and even suggested sources to be tested. Given the court-ordered deadline for EPA to issue the final SSI rule, it was not possible to undertake the time-consuming process of sending an ICR to all the affected SSI units consistent with the requirements of the PRA.

Comment: One commenter (83.1) stated that EPA's rush to issue this rule has put enormous and unwarranted pressure on the municipal wastewater industry to form an understanding of the impacts of this rule and respond accordingly; the fact that we are still

discovering potentially negative and costly impacts at the eleventh hour should be cause for concern by EPA.

Response: EPA thanks the commenter for their input. EPA has made all efforts to address public comments and concerns. Furthermore, we conducted one public hearing to allow the public to comment on the proposed rulemaking. In response to these comments, EPA is has revised the standards accordingly.

25.0 ELECTRONIC DATA SUBMITTAL

Comment: At least two commenters (62.1, 76.1) stated that requiring submission of reports via ERT database is burdensome, and confusing. One commenter (76.1) stated that the existing ERT is very cumbersome and difficult to use, and should be updated with special attention to the user interface. The commenter claimed that if EPA does not revise the ERT user interface, many agencies will elect to not use electronic reporting and submit data on hardcopy.

Response: EPA thanks the commenters for their suggestions and feedback. As with any new tool, it may take some practice before a new user will get familiar with the ERT. Since the initial distribution of version 3-1 of the ERT there have been 26 revisions to address interface and other issues identified by users. Additional improvements are planned for the product to expand the product and to streamline data entry. The ERT contains fields for entering data that is typically contained in a test report. It does not require any additional or superfluous reporting. The ERT will allow EPA to collect data consistently from sources across the board. Also, EPA is working with State and local agencies to ensure that reporting needs are met.

EPA believes that industry, regulatory agencies and the public benefit from electronic data collection in that it increases the accessibility and transparency of these data, provides the potential for reducing regulatory review resources and not increase resources for submitting the data. In conducting performance test data for required reviews, EPA has found it ineffective and time consuming, not only for us, but also for regulatory agencies and source owners and operators to locate, collect, and submit emissions test data because of varied locations for data storage and varied data storage methods. In this final rule, EPA is taking a step to improve data accessibility and increase the ease and efficiency of reporting for sources. EPA has also worked with industry sectors to answer questions and provide assistance in using the ERT.

The ERT was developed with input from stack testing companies who generally collect and compile performance test data electronically and offices within state and local agencies that perform field test assessments. The ERT is currently available at http://www.epa.gov/ttn/chief/ert/ert_tool.html, and access to direct data submittal to EPA's electronic emissions database (WebFIRE) will become available by December 31, 2011. On the ERT website, there are numerous User Help documents including training guides and webinars available.

We believe industry will benefit from development of improved emission factors, fewer follow-up information requests, and better regulation development as discussed below. One major advantage of submitting source test data through the ERT is a standardized method to compile and store much of the documentation required to be reported by this rule that also clearly states what testing information would be required. Another important benefit of submitting these data to EPA at the time the source test is conducted is that it should substantially reduce the effort involved in data collection activities in the future. When EPA has source category performance test data in hand, there will likely be fewer or less substantial data collection requests in conjunction with prospective required residual risk assessments or technology reviews. This results in a reduced burden on both affected facilities (in terms of reduced manpower to respond to data collection requests) and EPA (in terms of preparing and distributing data collection requests and assessing the results).

State/local/tribal agencies may also benefit in that their review may be more streamlined and accurate because they would not have to re-enter the data to assess the calculations and verify the data entry. Finally, another benefit of submitting these data to WebFIRE electronically is that these data will greatly improve the overall quality of the existing and new emission factors by supplementing the pool of emissions test data upon which the emission factor is based and by ensuring that data are more representative of current industry operational procedures. In summary, in addition to supporting regulation development, control strategy development, and other air pollution control activities, receiving test data already collected and using them in the emissions factors development program will save industry, state/local/tribal agencies, and EPA significant time, money, and effort while improving the quality of emission inventories and related regulatory decisions.

Comment: One commenter (76.1) recommended EPA upgrade the Electronic Reporting Tool (ERT) into a spreadsheet format to eliminate the possibility of additional errors during data transposition. The commenter (76.1) stated that the ICR survey, which incorporated the ERT, was formatted as a questionnaire rather than a series of spreadsheets; the information reported had to be transposed to a spreadsheet in order to be used effectively in a database. The commenter (76.1) purported that the use of spreadsheets would have made the ICR experience less cumbersome and could avoid errors in the processing of data transposition into the EPA database.

Response: EPA thanks the commenters for their suggestions and feedback. In developing the ERT, we evaluated the use of spreadsheet applications and determined that this was inefficient. We recognize that many source test contractors used their own field data spreadsheets rather than the one we provide with the ERT to record data. While we provided directions to copy field data from their field data spreadsheet into the ERT avoiding transcription errors, we understand that a few users continued to have difficulties. In future updates of the ERT user manual, we will include directions for modifying company specific spreadsheets to allow for easier and more consistent importing field data. We will also evaluate and revise if necessary the existing directions for manual importing of field data.

26.0 STATUTORY BASIS FOR REGULATING SSIS UNDER SECTION 129 (E.G., VS. 111)

Comment: Numerous commenters (83.1, 58, 61.1, 63.1, 67.1, 68.1, 69.1, 70.1, 71.1, 72.1, 73.1, 74.1, 78.1, 81.1, 83.1, 87.1, 89.1, 90.1, 93.1, 94.1, 96.1, 97.1, 127.1 101.1, 102.1, 103.1, 105.1, 106.1, 107.1, 109.1, 111.1, 112.1, 113.1, 114.1, 115.1, 116.1, 117.1, 118.1, 120.1, 126.1, 131.1, 132.1, 136.1, 138, 129.1) argued that SSIs are within the scope of the Clean Water Act definition of POTWs; therefore, according to Section 112(e)(5) of the Clean Air Act, EPA must regulate SSIs under Section 112(d), and not Section 129. Several of these commenters (58, 63.1, 67.1, 68.1, 69.1, 71.1, 74.1, 83.1, 87.1, 90.1, 90.1, 94.1, 97.1, 127.1, 103.1, 105.1, 109.1, 111.1, 112.1, 114.1, 115.1, 118.1, 120.1, 126.1, 138) stated that they (or others) have upgraded or constructed their SSIs using Clean Water Act Construction Grant Funding. Many of these commenters (58, 61.1, 63.1, 67.1, 68.1, 69.1, 70.1, 71.1, 72.1, 74.1, 81.1, 87.1, 90.1, 93.1, 101.1, 102.1, 103.1, 105.1, 106.1, 107.1, 109.1, 110.1, 110.1, 111.1, 112.1, 113.1, 114.1, 115.1, 116.1, 117.1, 118.1, 120.1, 126.1, 132.1, 136.1, 129.1) emphasized that their SSIs are located within each respective POTW and are wholly integrated into the solids handling and treatment processes at each respective POTW. Other commenter (97.1, 127.1) argued that all SSIs are located within the boundaries of a POTW and nearly all are owned and operated by the municipalities that own and operate the POTW. One commenter (120.1) is specifically concerned that if SSIs become regulated under Section 129 of the Clean Air Act, a potential long term impact could be an interpretation that they are not eligible for funding under the Clean Water Fund Loan program because they are not regulated under Section 112(e) of the Clean Air Act. Another commenter (138) stated that the preamble to the MACT rule provides no legal basis for ignoring decades of EPA actions under the construction grants program that treated SSIs as part of the POTW.

Response: Please refer to Section V.A. of the SSI preamble for the response to these comments.

Comment: One commenter (120.1) is specifically concerned that if SSIs become regulated under Section 129 of the Clean Air Act, a potential long term impact could be an interpretation that they are not eligible for funding under the Clean Water Fund Loan program because they are not regulated under Section 112(e) of the Clean Air Act. Another commenter

(138) stated that the preamble to the MACT rule provides no legal basis for ignoring decades of EPA actions under the construction grants program that treated SSIs as part of the POTW.

Response: The Clean Water Fund Loan program is outside the scope of this rulemaking.

Comment: Some commenters (83.1, 97.1, 127.1) stated that EPA resisted Section 112(e)(5) of the CAA in its Proposed Rule by arguing that it did not include SSI emission standards in its 1999 POTW emissions rule because it intended to regulate SSIs as "other solid waste incineration units" ("OSWI") under CAA Section 129. The commenters (83.1, 97.1, 127.1) stated that EPA's statement is belied by the fact that it subsequently excluded SSIs from regulation as OSWI, and stated specifically that it had "decided not to regulate SSI under the OSWI rules. We are developing regulations for SSI under CAA section 112." One commenter (97.1, 127.1) stated that in February 2002, EPA revised its list of source categories under §112 to delete SSIs, not because they were not covered by §112, but because there were no major sources in that category (See 67 Fed. Reg. 6521 (Feb. 12, 2002)). The commenters (97.1, 127.1) stated that EPA then added SSIs to the list of area source categories under §§112(c) and 112(k) of the CAA (See 67 Fed. Reg. 43112 (Jun. 26, 2002); and 67 Fed. Reg. 70427 (Nov. 22, 2002)).

One commenter (97.1, 127.1) argued that the legislative history of CAA §129 is silent to both POTWs and SSIs, and no public health or environmental benefit will be realized from including SSIs under CAA §129. The commenter (97.1, 127.1) argued that EPA has already regulated SSIs as intended under CAA §112 by identifying SSIs as an area source category under this section. The commenter (97.1, 127.1) stated that EPA examined the issue of the CAA regulation of SSIs in 1992, when it issued its initial list of major and area source categories under §112 (See 57 Fed. Reg. 31576 (July 16, 1992)). The commenter (97.1, 127.1) stated that the initial list included SSIs as a §112 source category, and in this notice EPA expressly states “the Agency does not consider sewage sludge incineration units to be covered under §129 so it has authority to list and set standards for these units under §112.” See also 58 Fed. Reg. 9248, 9262, 9276-77 (Feb. 19, 1993) (noting that SSIs are regulated under §112 of the CAA).

Commenters (83.1) argued that EPA's determination that it is bound by the NRDC case to regulate SSIs at POTWs under Section 129 of the CAA is based upon an overly broad reading of that case. The commenters (83.1) stated that they do not read the NRDC case as directly on point with regard to this issue because the case does not make any holdings about the proper definition of solid waste or regarding the proper regulation of SSIs that are a part of POTWs. Another commenter (97.1, 127.1) stated that the court in the NRDC case did not address §112(e)(5), nor

did it specifically address the regulation of POTWs or SSIs, so the decision in that case has no bearing on how SSIs are to be regulated under the CAA.

Other commenters (73.1, 121.1, 97.1, 127.1) stated that EPA has the discretion and authority to preserve the current framework for regulating sewage sludge under §405 of the Clean Water Act and urged this authority be exercised. One commenter (73.1) stated that this would retain the risk based approach and maintain the effective regulatory approach under 40 CFR part 503 and §112 of the CAA. Another commenter (97.1, 127.1) stated that emissions from SSIs are already regulated by other Congressionally-mandated, comprehensive regulations that are adequately protective of human health and the environment, and provided a detailed history of this regulation including section 405(d) of the CWA and 40 CFR Part 503 standards.

Response: Please refer to the SSI preamble for the response to these comments.

Comment: One commenter (97.1, 127.1) said that EPA does not explain how it reached the conclusion that SSIs are not covered by the expansive CWA definition of "treatment works" incorporated into CAA §112(e)(5), how its interpretation is possible in light of the integral role SSIs play in the management of sewage sludge, or how SSIs could have been built and improved using CWA Title II funds if they are not part of the CWA definition of "treatment works."

Response: Please refer to the SSI preamble for the response to these comments.

Comment: One commenter (97.1, 127.1) contended that EPA fails to recognize its own contrary statements and actions, stating that shortly after EPA promulgated the POTW NESHAP, EPA reversed its position and expressly stated that SSIs would be regulated under §112 instead of §129 (See Unified Agenda 65 Fed. Reg. 23459-01 (Apr. 24, 2000)).

Response: Please refer the SSI preamble for the response to these comments.

Comment: One commenter (97.1, 127.1) stated that EPA faces legal obstacles to using §129 to regulate SSIs because they do not fit the statutory definition of "solid waste incineration unit." Two commenters (138, 97.1, 127.1) stated that EPA cannot ignore the language in section 129(g)(1) in that POTW sewage sludge is not from a commercial or industrial establishment or the general public. The commenters (138, 97.1, 127.1) contended that SSIs cannot be regulated under §129 because they are combusting a material that is generated by the POTW, which is neither a commercial or industrial establishment nor the general public. The commenter (138) pointed out that, based on the proposed definition of solid waste, even if they had a new point of generation within the POTW where they are generating solid waste, the POTW sewage sludge is from a municipal source and does not pass the broad applicability for solid waste incineration

under section 129. The commenter (97.1, 127.1) pointed out that Section 129(a)(1)(B)-(C) also directs EPA to set standards for "solid waste incineration units [of specified sizes] combusting municipal waste ... ." But to qualify as a unit combusting "municipal waste" the unit must first be a "solid waste incineration unit," which does not include SSIs.

Response: Please refer to the SSI preamble for the response to these comments.

Comment: One commenter (101.1) stated that that EPA's Proposed Standards for SSIs, as advanced under Section 129 of the CAA, are not rationally related to the goal of environmental protection sought to be achieved; the Proposed Standards will result in the expenditure of significant amounts of public funds at a time when such resources are in scarce supply, and that the Proposed Standards, if adopted, would undermine the goals of the CAA. Commenters (83.1) opposed the designation of sewage sludge as a solid waste because subjecting incineration to much more costly Section 129 CAA mandates would effectively close the door on incineration as a viable management option. Two commenters (102.1, 116.1) are concerned that they will be impacted in extreme and adverse ways if sewage sludge is regulated as a solid waste and SSIs are required to comply with the proposed Section 129 standards.

Response: EPA disagrees. First, EPA is required by section 129 of the CAA to issue emissions standards for SSIs. Further, as explained in section VI of the preamble, the final rules will achieve reductions of the section 129 pollutants from SSI units. We have revised the costs and impacts in the final rule based on comments received on the proposal and corrections made to the analysis. A detailed discussion of the analysis is provided in the memorandum "Revised Cost and Emission Reduction of the MACT Floor Level of Control" in the SSI docket (EPA-HQ-OAR-2009-0559).

Comment: One commenter (51.1) is concerned that 40 CFR Part 503 and Clean Water Act requirements are insufficient to control variations in charged wastes (75 FR 63270). The commenter (51.1) provided as an example a SSI unit at a WWTP that makes occasional requests for approval to combust non-sewage sludge waste materials, without pretreatment, either directly, or by blending with sewage sludge. The commenter (51.1) stated that these waste materials, which may include food processing wastes, waste from biofuel recyclers, oil and grease trap residues, and paper mill sludge, are not subject to the requirements of Part 503 as they are often not treated at the WWTP prior to incineration.

Response: Section 129 defines solid waste incineration unit to include any unit combusting any solid waste. Therefore, EPA is not setting de minimus levels for solid waste

burned in incinerators. Any amount of sewage sludge combusted in an incinerator located at a wastewater treatment facility designed to treat domestic sewage sludge is subject to the final SSI standards. Section 129 of the CAA requires EPA to set emission standards for SSIs. The final standards for SSI's provide assurance that emissions from any wastes combusted at SSI's, such as the wastes listed by the commenter, will be controlled and reduced.

Comment: One commenter (89.1) stated that implementation of the Proposed Standards would subject SSIs to potentially two sets of regulatory requirements, 40 CFR Part 503 and 40 CFR Part 60, which is contrary to Congressional intent.

Response: EPA notes that section 405 of the CWA expressly provides that nothing in that section is intended to waive more stringent requirements of any other law. Therefore, Congress clearly did not intend for regulation of SSI units under the CWA to preclude any other regulations. Because both part 503 and these final standards cover the same universe of facilities, there are certain issues that arise in terms of potential impacts to current SSI facilities. EPA plans to evaluate the requirements under the CWA to determine what changes, if any, should be made to the part 503 regulations.

Comment: One commenter (95.1) stated that Section 111 defines NSPS as a standard of performance based on the "best system" of emission reduction achievable, taking into account cost and any nonair quality health and environmental impact and energy requirements, that has been "adequately demonstrated"; the analysis is commonly referred to as "BDT," or "best demonstrated technology." The commenter (95.1) argued that EPA has not performed a BDT analysis for setting NSPS. The commenter (95.1) argued that failing to perform the required BDT analysis violates §111 as there is nothing in §129 that precludes the analysis required by §111. The commenter (95.1) stated that both statutory provisions are compatible: both sections require EPA to set "achievable" standards as section 129 merely provides a minimum level of stringency resulting from the BDT analysis EPA is required to use. The commenter (95.1) stated that EPA can still perform a BDT analysis and then check to see if the resulting standard meets the level of stringency required by §129. The commenter (95.1) noted that EPA is not required to establish floors first, and pointed out this was a process choice the Agency made a long time ago when it set the medical waste incinerator MACT standards under §129 (See Sierra Club v. EPA, 167 F.3d. 658, 660 (D.C. Cir. 1999)). The commenter (95.1) stated that EPA could decide to first determine what standards are "achievable" as NSPS and then check to see if these standards are as stringent as the floor benchmarks for new and existing sources.

Response: EPA disagrees that it must first look to section 111's definition of "standard of performance" in setting MACT standards under section 129. Section 129 specifically states that standards "promulgated under section 111 and this section [i.e., section 129]" shall reflect the maximum degree of reduction of emissions of the nine specified pollutants. Therefore, regardless of the language of section 111, EPA's section 129 standards must reflect MACT levels of reductions. As explained elsewhere in the docket for this rulemaking, EPA has reasonably estimated the emissions of the best-performing sources to establish the MACT limits, and the commenter provides no information to indicate that the MACT analysis would result in a different outcome if EPA first performed an analysis to identify the "best" system of emissions reductions as described in section 111.

27.0 SOURCE REDUCTION (I.E., THE STRATEGY OF REDUCING EMISSIONS AT THE UPSTREAM SOURCE)

Comment: One commenter (64.1) stated that EPA needs to strongly consider achievements that could be realized through improved sludge quality in comparison to more costly technology-based solutions. Several commenters (63.1, 82.1, 93.1, 97.1, 127.1, 114.1, 120.1, 129.1) supported mercury source reduction measures. Commenters (76.1, 121.1) stated that EPA should adopt upstream control technologies and eliminate beyond-the floor requirements, citing that upstream control is more efficient and cost effective than adding new processes to the treatment plant or modifying the MHF. One commenter (49.1) stated that EPA must evaluate and compare other proven means to reduce Hg emissions, including Hg source elimination/reduction, Hg treatment at source, chemical precipitation of scrubber water, and high efficiency scrubbers. Other commenters (82.1, 93.1, 135.1) stated that EPA should consider an overall mercury reduction strategy with a primary goal of eliminating mercury from the waste stream over a longer period of time than would be allowed by the proposed NSPS, and secondarily use add on controls to remove mercury from SSI flue gas.

Commenters (49.1) state that the likely sources of mercury discharges would be dental offices and industry, and notes that chemical treatment of dental and industrial wastes to reduce mercury discharge into the sewer should be part of the cost evaluation and would be more cost-effective than treating the incinerator off-gases. Commenters (82.1, 93.1) recommended installation of amalgam separators at dental facilities and implementation of best management practices at dental and other health care facilities to reduce the amount of mercury in the waste. Commenters (64.1, 76.1, 97.1, 124.1, 127.1, 138) provided costs and results of regional programs implemented by dentists to remove mercury through amalgam separator programs and claimed that the pollution prevention initiative is far more efficient and cost effective than SSI mercury controls. One commenter (64.1) stated that industrial pretreatment programs have successfully reduced emissions of mercury and other contaminants from sewage sludge incinerators in New Jersey. The commenter (64.1) further stated that new dental amalgram regulations could result in an additional 40 to 55 pound reduction in the amount of mercury being released. The commenter (64.1) estimated the total costs to comply with the proposed rule could exceed $30 million for New Jersey's eight SSI, and that sludge metals standards that can be achieved with pretreatment programs may be a better basis for a beyond the floor mercury limit

than add on control. Another commenter (76.1) provided information regarding the success of a local Household Hazardous Waste Program, which focuses on proper mercury disposal through acceptance of mercury containing wastes including thermometers, fluorescent bulbs, mercury switches, and elemental mercury. The commenter (76.1) stated that the annual operating cost for the program is approximately $2.3 million dollars or $639/1b of Hg removed, and has lowered the influent mercury concentrations by 70% in the past six years. One commenter (138) states that the Metropolitan Council Environmental Services of Saint Paul, Minnesota implemented a dental amalgam separator program with a fifty percent (50%) reduction in mercury in their biosolids. The commenter (138) also stated that the Northeast Ohio Regional Sewer District is implementing a dental amalgam separator program that will require a ninety-nine percent (99%) removal. Another commenter (124.1) noted that in Rhode Island, there has been a significant reduction (53.6%) in mercury in the influent to the treatment facilities since dentists have been required to use amalgam separators, and similar reductions from a MWRA facility in Massachusetts when dental amalgam separator requirements were implemented. One commenter (138) provided information regarding a household hazardous waste facility supported by Central Contra Costa Sanitary District. The commenter (138) describes the program, which focuses on proper mercury disposal through acceptance of mercury-containing wastes, including thermometers, fluorescent bulbs, mercury switches and elemental mercury; additionally, dentists were required to install amalgam separators and document proper disposal. The commenter (138) provides mercury reduction estimates for the program, stating that the program has collected over 1,700 pounds of elemental mercury and lowered influent mercury concentrations by 70%. The commenter (138) also provided annual operating costs for the program (~$2.3 million or $24,000 per pound of mercury removed). Two commenters (85.1, 110.1) stated that the City of Palo Alto implemented dental amalgam separator programs and saw mercury concentrations in their influent decrease by 60%. Commenters (85.1) also described the Palo Alto programs for mercury source control, including legislation that eliminated mercury in thermometers, certain switches, and novelty items (Chapter 656, Statutes of 2001), dental amalgam separator programs including training programs for dental office workers, and ongoing drop-off programs for mercury-containing equipment including thermostats, thermometers, medical devices, switches, reagents, and medicines containing mercury. The commenter (85.1) also provided estimates of the cost effectiveness of beyond-the-floor mercury reductions associated with the Palo Alto dental amalgam program of approximately $18 million per ton of mercury removed.

Response: EPA thanks the commenter for their input. However, source reduction is outside of the scope of this rulemaking. EPA is required by Section 129 of the Clean Air Act to issue emission standards for SSI's.

Comment: Two commenters (107.1, 138) agreed with EPA's intentions to propose a rule which will require the installation amalgam separators in dental offices to capture a minimum of ninety-five percent (95%) of the mercury. One commenter (107.1) stated that mercury emission from SSIs may be significantly reduced by EPA-mandated control of mercury discharge from dental clinics.

At least three commenters (111.1, 117.1, 131.1) stated that EPA is premature in proposing the rule at this time, noting that EPA intends to issue a ruling that will require dentists to install dental amalgam separators to reduce mercury emissions; the commenters (111.1, 117.1) argued that since mercury loadings to POTWs will soon be reduced due to the new ruling, it would be best to wait for the results of that rulemaking to be measured before determining the quantity of mercury emissions from POTWs. One commenter (75.1) stated that sludge mercury concentrations will likely not be an issue when EPA-mandated controls for dental clinics are fully implemented. Another commenter (135.1) stated that it is reasonable to assume that mercury concentration in sewage sludge will continue to decline over time as mercury becomes less prevalent in the state, and residual deposits of mercury gradually attenuate upstream from and within wastewater collection systems. One commenter (117.1) also stated that mercury put in sewer pipe upstream from a treatment facility may never reach the POTW due to a variety of conditions in the collection system, and therefore, it is best to remove the pollutant at the beginning of the pipe.

Response: EPA thanks the commenters for their input. However, source reduction is outside of the scope of this rulemaking. EPA is required by Section 129 of the Clean Air Act to issue emission standards for SSI's.

Comment: One commenter (124.1) expressed concern that EPA is not requiring sewage sludge incinerators to establish a Waste Management Plan, specifically a Mercury Control/Reduction Plan that would, at a minimum, require that dentists use amalgam separators. The commenter (124.1) stated that implementation of Waste Management Plans or Mercury Reduction Plans is vital for reducing mercury in sludge. The commenter (124.1) suggested that if a municipality or state has amalgam separator requirements that have substantially lowered the mercury content in the sludge, the rule should allow for the ability to establish compliance

schedules for the installation of MACT control systems beyond the proposed 12 months. The commenter (124.1) suggested that where facilities have already achieved substantial reductions, the rule should allow up to an additional 12 -24 months for MACT compliance.

Response: EPA thanks the commenter for their input. However, source reduction is outside of the scope of this rulemaking. EPA is required by Section 129 of the Clean Air Act to issue emission standards for SSI's. The waste management plan for Section 129 sources would apply only to SSI units and not the source generating the pollutant. We have determined that SSI units are already complying with OW's 503 standards. In order to meet the 503 standards, facilities are already incorporating management practices and measures to reduce waste and limit the concentration of pollutants in the sludge sent to SSI units, such as segregating contaminated and uncontaminated wastes and establishing discharge limits or pre-treatment standards for non-domestic users discharging wastewater to POTW.

Comment: Commenters (64.1) were of the opinion that an effective pretreatment program would be an appropriate floor, or beyond the floor, control measure for mercury. One commenter (85.1) stated national source control is a more desirable and cost effective to achieve beyond-the-floor mercury reductions for SSIs. The commenter (85.1) asserted that only source control can truly prevent environmental release of mercury, and expressed concern that the wet scrubbing in EPA's control strategy analysis would simply transfer airborne mercury to the water stream. The commenter (85.1) also stated that attempting to take mercury to a landfill could result in volatilization and release. At least two commenters (85.1, 110.1) contended that EPA should duplicate their effort of using mercury source control for hazardous waste incinerators (EPA Docket HQ-OAR-2004-0022) in their beyond-the-floor mercury control for SSIs. One commenter (85.1) stated that EPA should estimate the mercury level that can be achieved in sewage sludge incinerator stack gas after implementation of full source control. The commenter (85.1) assumed that once amalgam separators are in place at dental offices nationwide, a 60 % reduction in baseline mercury emissions from SSIs can be expected. Another commenter provided (134.1) additional support and statistics for amalgam separators and added "We disagree with the mercury BTF MACT limit analysis and believe it is will overestimate the level of mercury reductions achievable by additional air pollution control measures on SSIs by failing to recognize certain key developments in the area of mercury reductions from dental amalgams." At least one commenter (108.1) stated that EPA ignored upcoming dental amalgam regulations. Another commenter (134.1) stated that while they would not recommend including these as

mandatory elements of the proposed regulations, there should be some consideration given to designating mercury source control as the most appropriate and effective technique for reducing mercury emissions from SSI units and, hence MACT for mercury control.

Response: EPA thanks the commenters for their input. However, source reduction is outside of the scope of this rulemaking.

Comment: One commenter (135.1) provided a list of Connecticut statues established under the Mercury Reduction and Education Act (P.A. 02-90). The commenter (135.1) stated that the initiatives and statutory requirements aided in the noticeable reduction of the total quantity of mercury discharged into municipal wastewater streams throughout Connecticut. The commenter (135.1) reiterated that removing mercury from the environment would be a more favorable goal then transferring mercury from one media (air) to another (solid waste) as would result from the addition of air quality controls system for mercury removal. The commenter (135.1) suggested further investigation into the sources of mercury found in wastewater treatment plant sludge nationwide, followed by an elimination effort.

Response: EPA thanks the commenter for their input. However, source reduction is outside of the scope of this rulemaking.