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March 17, 1997

The Air and Radiation Docket
and Information Center (6102)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Attn: Docket No. A-96-42

Re: Association of Metropolitan Sewerage Agencies' Comments to January 14, 1997
Notice of Additional Information - U.S. EPA's Intent to Delist Sewage Sludge
(Biosolids) Incinerators from Major Source Classification under Section 112 of
CAA and to List Sewage Sludge Incinerators as Sources Subject to Regulation
under Section 129 of CAA

Dear Sir or Madam:

The Incineration Workgroup of the Association of Metropolitan Sewerage
Agencies (AMSA) has completed its review of the United States Environmental
Protection Agency's (Agency) "Notice of Additional Information" as published in the
Federal Register on January 14, 1997 (62 FR 1868). In the Notice of Additional
Information, the Agency declares its intent to delist Sewage Sludge Incinerators (SSIs)
from the list of major sources of hazardous air pollutants (HAPs) under Section 112© of
the Clean Air Act (CAA) and its intent to list SSIs as Other Solid Waste Incinerators
(OSWIs) subject to regulation under Section 129 of the CAA.

AMSA fully understands and supports the Agency's intent to delist SSIs from the
Section 112 list of major sources of HAPs since there is substantial evidence that SSIs do
not qualify as "major sources" as defined under Section 112. However, AMSA strongly
opposes regulation of SSIs under Section 129 of the CAA for the following reasons:

1. The regulation of SSIs under Section 129 is beyond the Agency's statutory
authority;

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2. The Agency's contemplated method for establishing Maximum Achievable Control Technology (MACT) Standards for SSIs under Section 129 would lead to results contrary to the intent of Congress - i.e., it would lead to the elimination of sewage sludge incineration (a safe, viable and cost-effective sewage sludge management practice);
3. The properties of sewage sludge are very different from those of hazardous, medical or municipal solid waste. Thus, SSIs should not be subject to the same type of regulations imposed on these other types of incinerators;
4. The emissions from SSIs are already subject to comprehensive and stringent regulations that are protective of human health and the environment. The Agency has determined that, through compliance with the Part 503 limits and management practices, emissions from SSIs do not adversely affect human health and the environment; and,
5. Accordingly, no environmental benefit will be realized from the expensive and/or infeasible control measures that Section 129 will impose, and there may be a net loss of environmental benefit.

I. Incineration of Sewage Sludge

AMSA has over 170 members who own or operate approximately 700 Publicly Owned Treatment Works (POTWs), with members in more than 40 states and the District of Columbia. AMSA's 170 members are not limited to only large public agencies in major metropolitan areas but also include numerous smaller municipalities, with populations as low as 100,000. AMSA members utilize a number of Agency-approved methods, including incineration, to dispose of their sewage sludge in a safe and cost-effective manner.

At the present time, in excess of 20% of AMSA member agencies practice incineration, while the Agency has estimated, based on the 1988 National Sewage Sludge Survey, that approximately 16% of the sewage sludge removed from POTWs located within the United States is incinerated. Given the importance of incineration to AMSA members and the non-member POTWs that practice incineration, AMSA has closely monitored the Agency's actions in regulating SSIs, specifically the Agency's actions under Section 112 of the CAA and Section 405 of the Clean Water Act (CWA).

AMSA strongly disagrees with recent statements attributed to Agency personnel that incineration is not a preferred sewage sludge management option, and that incineration is the most costly means of sewage sludge disposal. This simply is *not* true for a number of communities and wastewater treatment agencies, especially for those agencies located in areas where available landfill space and agricultural application sites are scarce.

During an AMSA Incineration Workgroup meeting, held on January 22, 1997, a considerable number of Workgroup members indicated that due to the large quantity of sludge removed from the wastewater at their POTWs, their cost to incinerate is approximately one-half of the cost of landfilling and/or land

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application.

In addition, a study conducted by the Metropolitan Sewer District of Greater Cincinnati and the consulting firm of Black & Veatch suggests that the regulators' negative perception of incineration as a pollution source is unfounded when compared to other sewage sludge disposal options. Their findings were outlined in a paper entitled "Incineration - The Green Alternative? Comparison of Air Emissions with Other Solids Handling Processes" which was presented at the Water Environment Federation's 1996 Biosolids Management Conference.

AMSA believes that EPA's recent proposed change in direction toward regulating SSIs under Section 129 of the CAA, instead of Section 112, will have a significant *negative* impact on its members and other POTWs that practice incineration, while it will have a *negligible* beneficial impact on human health and the environment, or could even have a negative impact.

II. Standards for the Use and Disposal of Sewage Sludge (40 CFR Part 503)

AMSA is concerned that public and Agency personnel misperception with regards to current regulation of the incineration of sewage sludge is leading the Agency to stray from the comprehensive regulatory framework authorized by Congress under Section 405 of the CWA (above and beyond the historic CAA regulations applicable to all sources) that is directly focused on safe and effective management of sewage sludge, including incineration. Unlike some other types of incinerators, Congress has already mandated comprehensive, stringent regulation aimed specifically at use and disposal of sewage sludge, including incineration.

Since 1993, POTWs that practice incineration have been subject to SSI air emission limits pursuant to Section 405 of the CWA and its implementing regulations under the Agency's Sewage Sludge Disposal Regulation (40 CFR Part 503). For more than four years, these POTWs have dedicated significant time and expenditures to comply with the Part 503 Regulations. These Regulations include (1) numeric emission limits for arsenic, beryllium, cadmium, chromium, lead, mercury and nickel; (2) a Total Hydrocarbon (THC) or alternative carbon monoxide (CO) emission limit; (3) and numerous requirements regarding management practices.

The numeric emission limits and management practices requirements established under the Part 503 Regulations were derived from years of study and evaluation of the potential risks to human health and the environment which could be posed by the incineration of sewage sludge. As more fully detailed below, the regulation of SSIs under this existing regime are risk-based standards which were developed to protect human health and the environment from any reasonably anticipated adverse effects from pollutants that may be present in sewage sludge. *See generally* Section 405(d) of the CWA. As a result, owners/operators of SSIs can clearly demonstrate that the emissions from their units are *not* adversely impacting human health and the environment by demonstrating compliance with the Part 503 limits.

Prior to the promulgation of the Part 503 Regulations, the only emission limits placed directly upon

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SSIs were for total particulate matter and mercury. However, with the promulgation of the Part 503 Regulations and the required air emissions performance testing, the performance of SSIs has been enhanced. For example, the vast majority of AMSA members that practice incineration have confirmed the Agency's initial findings that the emissions of the newly regulated metals from their SSIs could be minimized by limiting the maximum combustion zone temperature, while the emissions of organic compounds can be reduced by increasing the incinerator's exhaust gas temperature, although at a substantial additional cost.

The existing regulatory regime established by Section 405 of the CWA and the implementing Part 503 Regulations is extremely conservative and more than adequately protects human health and the environment from potential adverse affects identified with the disposal of sewage sludge by incineration. The conservative nature of the Part 503 Regulations is exemplified by the fact that the Regulations are based on exposure to the Highly Exposed Individual (HEI) over 70-continuous years.

Moreover, the statutory framework of this regime provides for ample means of identifying and regulating additional concerns if supported by scientific evidence. In particular, Section 405 provides for Round II evaluations and biennial review specifically established for identifying and regulating any additional pollutants of concern. See Section 405 of the CWA. These conclusions are fully supported by the Agency's determinations made in promulgating the Part 503 Regulations. (See Section IV.B).

III. AMSA Supports Delisting of SSIs under Section 112 of the Clean Air Act

AMSA fully supports the Agency's intent to delist SSIs from the categories of major sources subject to Section 112 regulation. AMSA has provided EPA with scientific evidence that SSIs do not qualify as "major sources" as defined under Section 112 (sources that emit more than 10 tons per year (tpy) of any single HAP or 25 tpy of any combination of HAPs).

Section 112 of the CAA requires the Agency to identify and list categories of "major sources" of HAPs, which will then be subject to Maximum Achievable Control Technology (MACT) Standards promulgated for each category. On June 21, 1991, the Agency initially published a draft list of major sources of HAPs which included SSIs. 56 FR 28548. This list was published as final on July 16, 1992, and again identified SSIs as a major source of HAPs. 57 FR 31576.

At the time of the initial listing, SSI operators did not have complete data to evaluate the appropriateness of EPA's classification of SSIs as "major sources." However, upon notice of EPA's decision to regulate POTWs and SSIs under Section 112, AMSA's Air Quality Committee conducted an extensive survey that determined that less than 30 of the 189 listed Hazardous Air Pollutants (HAPs) are found in the influent to POTWs. The Ohio Air Quality Development Authority (AQDA) conducted additional study at two POTWs to determine which of the HAPs detected in the POTW influent were also detected in SSI stack emissions. This data was provided to the Office of Air & Radiation and revealed that 20 or less of the 30 HAPs found in POTW influent were detected in the stack emissions from the sample SSIs.

AMSA also evaluated the HAP emission data for SSIs contained within *AP-42: Compilation of Air Emission Factors*, and *Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources*. While AMSA has not independently verified the data contained in these sources and the Agency has acknowledged that its confidence in some of the emission factors is low, this data used in combination with AMSA's data from the aforementioned studies, yields conservative emission information for a total of 69 of the 189 HAPs. Based on this combined data, the average aggregate emission factor for SSIs is 0.32 pounds of HAPs per dry US ton of sewage sludge incinerated.

Given the conservative 0.32 lb/dry US ton emission rate, a sewage sludge incinerator that burns 50,000 dry US tons per year (an extremely high annual through-put rate) would emit, at most, 8 tons of HAPs per year ($0.32 \text{ lb/ton} \times 50,000 \text{ tons} \div 2,000 \text{ lbs/ton}$), far below the 25 ton per year major source threshold.¹ However, the highest HAPs emission rate in the Ohio AQDA test was 0.071 lbs. per dry ton. Based on this rate, a sewage sludge incinerator that burns 50,000 dry tons per year would emit only approximately 1.78 tons of HAPs per year, less than one-tenth of the threshold. The results of the aforementioned analyses conclusively establish that SSIs do not qualify as "major sources" under section 112 of the CAA.

AMSA believes that the extremely low levels of HAPs being emitted from SSIs are a result of the limited number of HAPs entering the POTWs, the low concentrations of HAPs in wastewater, and the fact that SSIs are subject to the Part 503 Regulations.

First, pursuant to regulatory directives (i.e., the Agency's General and Categorical Pretreatment Regulations) and independent initiatives, POTWs have implemented aggressive pretreatment programs which have focussed on limiting the amount of hazardous materials discharged to the sewers and to POTWs from industrial users. For example, one of the AMSA members has reported that over the last 20 years it has seen a 90% decrease in metals entering its plants due to its aggressive pretreatment program. In addition, the 1988 National Sewage Sludge Survey reveals that the General and Categorical Pretreatment Regulations have been successful.

Second, for compliance with the Part 503 metal limits, owner/operators of sewage sludge incinerators have found that by limiting their maximum combustion zone temperatures, they have been able to minimize metal emissions.

Third, with implementation of practices to control THC from SSI stack emissions to satisfy the Part 503 requirements, SSI operators have effectively controlled the emission levels of HAPs from SSIs. THC emissions correlate with organic emissions, and thus, THC is regulated as a surrogate for controlling the combination of all organic emissions. Accordingly, by controlling the level of THC emissions from SSIs, organic emissions are similarly controlled, including emission of those organics identified as HAPs under

¹ In other words, a POTW would have to incinerate over 150,000 tons per year of sewage sludge to even approach the 25 ton per year threshold ($0.32 \text{ lb/ton} \times 150,000 \text{ tons} \div 2,000 \text{ lbs/ton} = 24 \text{ tpy}$). AMSA is not aware of any POTW with an incineration through-put at this level.

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Section 112(b) of the CAA.

As a result of these efforts, the HAPs emissions from SSIs have already been effectively reduced to levels that are well below the levels which trigger "major source" classification under Section 112.

Based on the foregoing demonstration that SSIs do not qualify as "major sources" under Section 112, AMSA strongly believes that the Agency's decision to delist SSIs from its categories of major sources is scientifically-based, and therefore, an appropriate action. Further, delisting SSIs is consistent with the Agency's past practices in addressing sources originally listed but later determined not to be major sources, as well as the Agency's current strategy for implementing Section 112. Specifically, on June 4, 1996, the Agency published notice of its decision to delist five major source categories (including Chromium Chemicals Manufacturing, Lead Acid Battery Manufacturing, Non-Stainless Steel Manufacturing - Electric Arc Furnace Operation, Stainless Steel Manufacturing - Electric Arc Furnace Operation, and Wood Treatment) and one area source classification (Asbestos Processing) from the original Section 112 list. The Agency's delisting decisions were based on the Agency's own initiative pursuant to authority provided in Section 112(c)(9) of the CAA.

The basis for each of EPA's major source delistings was that "available data no longer support the determination that any major sources are present in each category." EPA further explained that these sources were otherwise regulated under existing regulations. SSIs should be delisted for the same reasons.

The Agency's intent to delist SSIs from Section 112 major source categories is also consistent with the Agency's current strategy in implementing Section 112(c). In its Integrated Air Toxics Strategy, the Agency identifies its overall strategy as identifying priorities for emission reductions, including identifying where regulation is not needed.

Specifically, the Agency explained that "it is important to make use of the available information to insure that [the Agency] is not expending efforts on regulations that are not needed." The Agency further explained that "de-listing source categories" is an important tool "that should be used when justified by information currently available to [the Agency] or made available to [the Agency]."

In conclusion, since currently available scientific evidence supports a determination that SSIs do not qualify as a "major source" of HAPs under Section 112, SSIs should be delisted and should not be subject to MACT Standards under Section 112. The Agency's intent to delist SSIs from major source classification under Section 112 is appropriate.

IV. AMSA Opposes Regulation of SSIs under Section 129 of the CAA

Based on careful and extensive review and analysis, AMSA strongly urges the Agency to reevaluate its recently announced proposal to regulate SSIs under Section 129 of the CAA. While AMSA is not opposed to the regulation of SSIs, it is opposed to regulation of SSIs under Section 129, since such action: (1) is beyond the Agency's statutory authority; (2) is not necessary to protect human health and the environment and

could result in a net loss of these protections; and (3) could lead to results contrary to the intent of Congress that the choice of sludge disposal methods is to be made at the local level, by causing the elimination of sewage sludge incineration -- a safe, viable and cost-effective sewage sludge management option, which has been approved by the Agency.

A. The Agency Lacks Authority to Regulate SSIs under Section 129 of the CAA

Section 129 of the CAA requires EPA to establish "performance standards" and other requirements for each category of "Solid Waste Incineration Units." Section 129(a)(1)(A) of CAA. These standards "shall include emission limitations and other requirements applicable to new units and guidelines . . . and other requirements applicable to existing units." *Id.* The standards "shall reflect the maximum degree of reduction in emissions of air pollutants listed under [the statute] that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing units in such category." Section 129(a)(2) of the CAA.

AMSA strongly opposes the regulation of SSIs under Section 129 of the CAA. As an initial matter, AMSA disagrees with the Agency's underlying premise for its change in direction in regulating SSIs. The Agency's stated premise is that SSIs are more appropriately regulated under Section 129 than under Section 112. While AMSA recognizes that Section 129(h)(2)² precludes regulation of a source category under both Section 112 and 129, it does not follow that SSIs must or should be regulated under *either* Section 112 *or* Section 129, if there is no basis for such regulation.

SSIs cannot be regulated under Section 129 of the CAA because the Agency lacks statutory authority to include categories that are not within the definitions provided by Congress. Support for this is found in the Agency's own position (at least until recently) that it lacks authority to regulate SSIs under Section 129. Contrary to the Agency's insistence in the January 14, 1997 Notice, the Agency's failure to identify SSIs as a Section 129 source was not a mere "oversight." The Agency has directly addressed the issue of regulation of SSIs under Section 129 on more than one occasion and has expressly concluded that SSIs are not governed under Section 129.

Specifically, the Agency expressed its conclusion that SSIs are not governed under Section 129 in the Preamble to the final initial list of Section 112 major sources, wherein it explained that:

"The Agency interprets section 129(h)(2) to preclude the inclusion on today's list (or any revisions of this list) of solid waste incineration units combusting municipal waste, hospital waste, medical waste, infectious waste, commercial or industrial

² Section 129(h)(2) of the CAA states that "no solid waste incineration unit subject to performance standards under this section [§ 129] and section 7411 of this title [§ 111] shall be subject to standards under section 7412(d) of this title [§ 112]."

waste. The rationale for this is that section 129(a) specifically requires the Agency to promulgate standards for units combusting these particular wastes under section 111 and section 129. *The Agency interprets section 129 as not requiring standards to be promulgated for sewage sludge incineration units under section 129, so these units are included on today's [Section 112] list.*"

57 FR 31576, 31584 (July 16, 1992) (emphasis added). The Agency continued, stating that:

"Several commenters argued that sewage sludge incinerators should not be listed because they are already regulated under CWA and by NSPS and NESHAP's. In response, *the Agency does not consider sewage sludge incineration units to be covered under Section 129, so it has the authority to list and set standards for these units under Section 112. . . .*" *Id.*

EPA reiterated this determination in the February 19, 1993 Preamble to the Final Part 503 Regulations, in which it stated that "[a]t this time, the Administrator has decided that listing [SSIs as a major source] under [§ 112 of the CAA] is required by legislation." 58 FR 9248, 9277. If the Agency, at that time, had determined that SSIs were governed by Section 129, it would have been foreclosed from regulating them under Section 112. *See* Section 129(h)(2). The Agency continued to rely on its determination that SSIs are not governed by Section 129 in its draft and initial listings of Other Solids Waste Incinerators (OSWIs) under Section 129 where it did not list SSIs. *See* 58 FR 31358 (June 2, 1993) and 58 FR 5498 (November 2, 1993).

The Agency's failure to list SSIs as OSWIs regulated under Section 129 was not a mere "oversight," but instead was a rational Agency determination based on the correct statutory interpretation that SSIs do not fall within the scope of Section 129.

1. SSIs Do Not Fall Within the Scope of Section 129 of the CAA

AMSA believes that the Agency's original conclusion was the correct conclusion, and strongly disagrees with the Agency's "reevaluation" set forth in the Notice that "[s]ludge generated by POTWs is a solid waste from the general public, commercial and industrial establishments." As fully explained below, sludge generated by POTWs is neither a "solid waste," nor is it "from the general public, commercial and industrial establishments." Simply stated, incinerators which combust sewage sludge do not fall within the scope of Section 129.

Congress limited the scope of Section 129 in its definition of "solid waste incineration unit" which is defined as:

"a distinct operating unit of any facility which combusts [1] any solid waste material [2] from commercial or industrial establishments or the general public (including

single and multiple residences, hotels, and motels).³

Section 129(g)(1) of the CAA.

If POTW sewage sludge does not satisfy *both* of those requirements, SSIs cannot be regulated under Section 129. POTW sewage sludge does not satisfy either requirement under Section 129:

- (1) Sewage sludge is not a "solid waste," and
- (2) Sewage sludge is not from commercial, industrial or public sources.

a. **Sewage Sludge Is Not a Solid Waste**

"Solid Waste" is defined in Section 129 of the CAA by reference to the definition of "solid waste" under the Resource Conservation and Recovery Act (RCRA): "The term [] 'solid waste' . . . shall have the meaning[] established by the Administrator pursuant to the Solid Waste Disposal Act [commonly referred to as RCRA]." Section 129(g)(6) of the CAA. RCRA defines "solid waste" as:

"any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage . . .*"

42 U.S.C. § 6903(27) (emphasis added).

Sewage sludge from POTWs is exempt from the definition of "solid waste" as "solid or dissolved material in domestic sewage." This exception is commonly referred to as the "Domestic Sewage Exclusion" under RCRA. In fact, both Congress and the Agency interpret the definition of "solid waste" under RCRA to exclude POTW sewage sludge pursuant to the Domestic Sewage Exclusion.

³ The definition specifically excludes: (1) incinerators or other units which are Treatment, Storage and Disposal Facilities (TSDFs) under RCRA; (2) materials recovery facilities which combust waste for the primary purpose of recovering metals; (3) "qualifying small power production facilities" and "qualifying cogeneration facilities" which burn homogeneous waste (such as tires or used oil) for the production of electric energy or electric energy and steam or forms of useful energy; and (4) air curtain incinerators, provided that such incinerators burn only wood wastes, yard wastes, and clean lumber. *Id.*

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While the Legislative History of Section 129 of the CAA is silent as to SSIs, the Domestic Sewage Exclusion had been written into the solid waste statute for 25 years at the time Congress passed the 1990 Clean Air Act Amendments (CAAA). Accordingly, in adopting the definition of "solid waste" under RCRA for purposes of Section 129, Congress was well aware of the Domestic Sewage Exclusion encompassed in the definition of "solid waste."

Moreover, shortly after Congress passed the 1990 CAAA, Congress turned to amending the Solid Waste Disposal Act to expand the scope of the Domestic Sewage Exclusion to cover Federally Owned Treatment Works. At the time of passage of this amendment (and after a year of debate and revision), Senator Chafee clearly confirmed Congress' understanding that the Domestic Sewage Exclusion exempts POTW sludge from RCRA regulation:

"Sewage treatment plants operated by local governments - POTWs - have a special exemption called the domestic sewage exclusion under RCRA. If most of the waste received by a POTW is domestic sewage, their *sludge* and wastewater is exempt from hazardous industrial waste regulation even if they are also receiving hazardous industrial waste through sewer connections."

138 Cong. Rec. 514755, 514758 (September 23, 1992) (emphasis added). Accordingly, in using the limited definition of "solid waste" under RCRA for purposes of defining the scope of Section 129, Congress was aware that POTW sewage sludge would be excluded from the Section 129 definitions, which, in turn, would exclude regulation of SSIs under Section 129. Express exemption of SSIs under the definition of "Solid Waste Incineration Units" under Section 129 would have been redundant.

The Agency similarly interprets the scope of the Domestic Sewage Exclusion to include sewage sludge generated by POTWs. The clearest example of the Agency's exclusion of POTW sewage sludge from the definition of "solid waste" under RCRA is found in the Agency's promulgation of a rule to identify and list hazardous wastes for petroleum refinery process wastewaters. In the Preamble to the Final Rule (November 2, 1990), the Agency concludes that POTW sewage sludge falls within the Domestic Sewage Exclusion:

"These wastes [F038 and K048 wastes] are being added to the list of [hazardous] wastes . . . in order to regulate sludges generated at wastewater treatment facilities on site at petroleum refineries as well as sludges generated at off-site wastewater treatment facilities."¹⁴

FN14 "It should be noted 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* and are not included in today's listings."

55 FR 46354, 46364 (November 2, 1990) (emphasis added).

As fully supported above, both Congress and the Agency interpret the definition of "solid waste" under RCRA to exclude POTW sewage sludge pursuant to the Domestic Sewage Exclusion. Therefore, POTW sewage sludge is not "solid waste" as defined by RCRA, and incinerators which combust POTW sewage sludge do not qualify as "Solid Waste Incineration Units" under Section 129. Therefore, SSIs cannot be included in the scope of Section 129.

b. Sewage Sludge Is Not from Commercial, Industrial or Public Sources

Not only is sewage sludge not a "solid waste," it is not "from commercial or industrial establishments or the general public" and for that reason, also falls outside the second part of the definition of "Solid Waste Incineration Unit." Instead, sewage sludge is from the publicly owned treatment works at which it is generated. While the untreated domestic sewage may be from the specified sources, *untreated* domestic sewage (as well as the resulting sludge) is irrefutably excluded from the definition of "solid waste" under the Domestic Sewage Exclusion, as supported by EPA's own definition. See 40 CFR § 261.4.

Congress' careful phrasing of the definition -- "solid waste material from commercial or industrial establishments or the general public (including single and multiple residences, hotels, and motels)" -- strongly indicates that Congress intended that *some* category of incinerators be excluded from Section 129 regulation. If that category is not SSIs, AMSA has been unable to identify any other category which could possibly fall outside the definition.

Congress expressly identified certain categories of incinerators which it deemed to qualify as "Solid Waste Incineration Units," including incinerators which burn municipal garbage, medical wastes, and wastes from industrial and commercial processes. Section 129(a)(1) of the CAA. In addition, Congress gave the Agency authority to identify (and regulate) "other solid waste incinerators."⁴ *Id.* However, Congress did not give EPA unlimited authority to do so. If Congress had meant for Section 129 to apply to any incinerator that receives any sort of solid material, it would have simply stated so -- e.g., Congress would not have added this second phrase which limits the scope of Section 129 to that "from commercial or industrial establishments or the general public," nor would it have incorporated the definition of "solid waste" under RCRA.

2. Congress Intended to Regulate Municipal Waste Incinerators, Not SSIs

It is important to reiterate that the Legislative History of Section 129 is fully consistent with and

⁴ In fact, EPA has identified seven categories of OSWIs: (1) Small Municipal Waste Combustors (<35 mg/d capacity), (2) Residential Incinerators, (3) Agricultural Waste Incinerators, (4) Wood Waste Incinerators, (5) Construction and Demolition Waste Incinerators, (6) Crematories, and (7) Contaminated Soil Treatment Facilities. See 58 FR 58498 (November 2, 1993).

supportive of AMSA's analysis. The provisions now codified in Section 129 of the CAA originated in a bill entitled "Municipal Waste Combustion Control Act of 1989," introduced in Congress on January 25, 1989. The express purpose of the proposed legislation was to address the "garbage crisis" facing the nation in the late 1980s -- "the unseemly aspects of the growing garbage crisis -- garbage washing upon ocean beaches, a garbage barge sailing the Caribbean for weeks in search of a disposal facility." 135 Cong. Rec. S289-01 (January 25, 1989).

It is further explained that Congress' underlying objective was to "establish the needed regulatory program to make *municipal waste incineration* an environmentally sound part of our Nation's waste management. *Id.* Moreover, the origin of the pollutants regulated under Section 129 were those which Congress expressly identified with the incineration of *municipal solid waste* (not POTW sewage sludge) -- "Air pollutants of concern emitted by municipal waste incineration units include dioxin, lead and other heavy metals, sulfur dioxide, acid gases, carbon monoxide, and particulate matter." *Id.* (The initial list of pollutants of concern have remained substantially unchanged under Section 129 -- "particulate matter (total and fine), opacity (as appropriate), sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, dioxins and dibenzofurans.")

While the subsequent Legislative History reveals some concern with incinerators other than municipal waste combustors, those concerns of Congress were limited to medical waste incinerators and industrial incinerators burning waste paper, wood, yard wastes, food wastes, batteries and plastics. Importantly, however, the Legislative History of Section 129 does not once even mention POTW sewage sludge or SSIs, nor is there even a hint that Congress' concerns over the incineration of municipal solid waste extended to the incineration of sewage sludge.

Based on the foregoing, Congress did not intend SSIs to be subject to Section 129 regulation. While Congress provided the Agency with authority to identify categories of OSWIs, it limited the Agency's authority in this regard to incinerators which combust "solid waste" as defined under RCRA and only solid waste "from commercial or industrial establishments of the general public." SSIs do not fall within this definition, and therefore, cannot be regulated under Section 129 of the CAA. The statute simply does not provide the Agency with the authority to regulate SSIs under Section 129. Congressional intent supports no other conclusion.

B. Regulation of SSIs under Section 129 Is Not Necessary for the Protection of Public Health and the Environment

AMSA is specifically concerned that the Agency's recent change in direction is premised on public misperception of the protections established by current regulation of SSIs. AMSA's concern was heightened by the Agency's contention in the January 14 Notice of Additional Information that regulation of SSIs under Section 129 is appropriate to "assure the public that the SSI are being operated in a manner that will protect the public health." AMSA strongly disagrees with this contention.

1. SSIs Are Currently Stringently Regulated

As mentioned above, SSIs are currently regulated under Part 503 Regulations, which are risk-based standards (as opposed to technology-based standards imposed by Section 129 of the CAA). In addition, SSIs are subject to numerous other air emission regulations, including New Source Performance Standards for particulate matter and a National Emission Standard for mercury. Moreover, states have authority to regulate and in fact do regulate (where deemed appropriate) air emissions of priority pollutants -- particulate matter, SO₂, CO, NO_x, etc. -- from SSIs through their SIP provisions.

If SSIs were to be regulated under Section 129, the Agency would develop national numerical SSI emission limits (MACT Standards) for particulate matter (total and fine), opacity (as appropriate), sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, and dioxin and dibenzofurans. These standards are to be developed based on Maximum Achievable Control Technology (MACT), where emission limits are not less stringent than the average emissions limitation achieved by the best performing 12% of the SSIs in the United States.

These stringent limits are required under Section 129 regardless of whether *any* risks to human health or the environment exist. That is, Section 129 in some cases mandates huge expenditures to address non-existent problems.

As explained above, the pollutants set forth in Section 129 are those pollutants which Congress identified as concerns for municipal waste combustors, not SSIs. Moreover, SSIs are already regulated for a large number of pollutants which have been identified as concerns for SSIs specifically (some of them are the same as and some are different than the Section 129 pollutants), where risk to human health and the environment has been shown. Moreover, if additional restrictions, based on risk-based analyses, are deemed necessary, existing regulatory mechanisms are available.

An analysis of the current stringent regulation of SSIs in conjunction with the Congressional mandate for the 503 Regulations -- to adequately protect public health and the environment -- clearly establishes that further regulation of SSIs under Section 129 is not appropriate or necessary for protection of human health and the environment. Thus, AMSA believes that there is no rationale to subject SSIs to MACT Standards for the aforementioned pollutants.

Examples of existing SSI regulatory requirements for the pollutants listed in Section 129, or information on emissions from SSIs, are as follow:

1. For total particulate matter, all SSIs built after June 1973, or modified since that time, are subject to a New Source Performance Standards of 1.3 pounds of particulate (total) per dry ton of sludge incinerated. 40 CFR Part 60, Subpart O.
2. For fine particulate matter (currently PM₁₀), new or modified sources which are major emitters of PM are subject to stringent technology standards, either Lowest Achievable Emission Rate

(LAER) for non-attainment areas or Best Available Control Technology (BACT) for attainment areas. In addition, most states impose some level of control technology for new but smaller sources of PM (such as "Best Available Technology"). In addition, states can and do impose Reasonably Achievable Control Technology (RACT) Standards for existing sources which are determined to be major contributors of PM in impacted areas.

3. For opacity, states consistently impose limits, typically 20% opacity on a six minute average.
4. For Sulfur Dioxide, new or modified sources which are major emitters of Sulfur Dioxide are subject to stringent technology standards, either LAER for non-attainment areas or BACT for attainment areas. In addition, most states impose some level of control technology for new but smaller sources of Sulfur Dioxide. In addition, states can and do impose RACT Standards for existing sources which are determined to be major contributors of Sulfur Dioxide in impacted areas.
5. Hydrogen Chloride emissions from SSIs, while not regulated, are very small compared to emissions from other industries, and therefore constitute a nominal percentage of the total.
6. For Oxide of Nitrogen (NOx), new or modified sources which are major emitters of NOx are subject to stringent technology standards, either LAER for non-attainment areas or BACT for attainment areas. In addition, most states impose some level of control technology for new but smaller sources of NOx. In addition, states can and do impose RACT Standards for existing sources which are determined to be major contributors of NOx in impacted areas.
7. Carbon Monoxide (CO) has already been reduced by the addition of a THC emission limit under the Part 503 Regulations. In addition, the Agency is allowing CO to be used as a surrogate for THC, under the Part 503 Regulations.
8. The Part 503 Regulations already establish risk-based, site-specific SSI emission limits for cadmium and lead. (The Part 503 Regulations also established site-specific, risk-based limits for arsenic, chromium and nickel.)
9. The Part 503 Regulations require SSI emissions to satisfy the National Emission Standard for Hazardous Air Pollutants (NESHAPs) Standard for Mercury. 40 CFR Part 61, Subpart E.
10. AMSA and its consultant, Cambridge Environmental Inc., have determined through emissions performance testing, that SSIs emit less than 0.08% of the total dioxin/dibenzofurans released to the atmosphere each year, and the Agency concurs that SSIs are a very minor source of dioxin and dibenzofurans.

Clearly, SSIs are subject to comprehensive, stringent regulation. Further regulation under Section 129 is simply not necessary.

2. The Part 503 Regulations Ensure Protection of Public Health and the Environment

In combination, the existing regulations applicable to SSI air emissions, especially the Part 503 Regulations, are more than adequate to "assure the public that SSIs are being operated in a manner that will protect public health." The Part 503 Regulations were promulgated after years of study and evaluation of SSI emissions. As mandated by Congress, the Agency identified those pollutants "which, on the basis of available information on their toxicity, persistence, concentration, mobility or potential for exposure, may be present in sewage sludge in concentrations which may adversely affect public health or the environment." Section 405(d)(2)(A) of the CWA. Also, as mandated by Congress, the numerical emission limits and the management practices required by the Part 503 Regulations "are adequate to protect public health and the environment from any reasonably anticipated adverse effects of each pollutant." Section 405(d)(2)(D) of the CWA.

The Agency complied with these mandates, as it repeatedly assured the public in the Preamble to the Final Part 503 Regulations (February 19, 1993). For example, the Agency describes the Part 503 Regulations as requiring "an unprecedented effort to assess the potential for pollutants in sewage sludge to affect public health and the environment through a number of different routes of exposure." 58 FR at 9248. More directly, the Agency concluded that:

"EPA is confident that the regulations it is promulgating today adequately protect public health and the environment from all reasonably anticipated adverse effects, as required by section 405(d), for several reasons. First, EPA has evaluated its regulations for aggregate national health impact. As explained in more detail below, even given very conservative assumptions that probably overstate exposure, there are virtually no effects when sludge is disposed of on the land or used as a soil conditioner or fertilizer in compliance with these rules. Further, even when sludge is incinerated and the population potentially exposed to the incinerator emissions is greater, the effects are small."

58 FR at 9249 (emphasis added). The Agency continued, explaining that:

"The Agency is comfortable that the regulations promulgated here are adequately protective because most of the effects that these regulations are designed to prevent are largely chronic, not acute ones. Even in the unlikely event that new information dictates reconsideration of some of the determinations on which EPA has based its health conclusions for this rule, there would be no adverse short-term human health consequences since standards to protect against chronic effects are well below acute effects levels."

Id. The Agency expressly concluded that:

"Therefore, the Agency has determined that today's rule meets the statutory directive

that the standards protect against reasonably anticipated adverse effects of the pollutants.”

Id. at 9252.

In addition, the Agency also used high standards for determining the impact of emissions from sewage sludge incinerators on human health:

“In all cases, EPA used cancer potency values corresponding to an incremental carcinogenic risk level of 1×10^{-4} to evaluate the risk from pollutants found in sewage sludge. (The exposure level of a pollutant associated with a 1×10^{-4} cancer risk implies that one additional cancer case will occur in a population of 10,000 exposed at that level for 70 years.) For purposes of establishing the numerical limits for incinerators promulgated today, EPA did, however, evaluate exposure at different incremental cancer risk levels (i.e., 1×10^{-4} through 1×10^{-6}). In the case of human health, the final limits for pollutants in sewage sludge ensure that the use and disposal of sludge does not result in ambient concentrations of the regulated pollutants that exceed an incremental carcinogenic risk level of 1×10^{-4} .”

Id. at 9254. In addition, for incineration, the metal and THC levels were “designed to ensure that ground level concentrations . . . did not exceed a value associated with protection of human health at a cancer risk level of 10^{-5} . *Id.* at 9266-67. To evaluate exposure, the Agency used an individual living in close proximity to a sewage sludge incinerator and assumed this individual “inhale[d] particulates and gases from the incinerator **24 hours per day, 365 days per year for 70 years.**” *Id.* at 9288 (emphasis added). The Agency further assumed that “this highly exposed individual is located at a point where the highest annual ground level concentration of incinerator emissions occurs.” *Id.* Clearly, the Agency developed the Part 503 standards using a very conservative scenario.

Moreover, the Agency used very conservative assumptions in the risk assessment for sewage sludge incineration, resulting in overstatement of the actual risk:

“ . . . the risk assessment for incinerator [sic] included **very conservative assumptions**. These assumptions yielded results that the Agency has concluded probably **overstate the risk** associated with current levels of sewage sludge incinerator organic emissions.

The risk assessment numbers are based on estimations of organic emissions from sewage sludge incinerators. In order to develop these estimations, **a number of very conservative assumptions** were made for both the best *estimate and worst case* scenarios, that probably results in **overstating THC emissions** for purposes of this analysis. These include assuming that *all* organic compounds that were sampled and analyzed for at seven sewage sludge incinerators . . . are present in the organic emissions of 172 POTW incinerators. In fact, the data establish that many of these

compounds (including aldrin/dieldrin and hexachlorobenzene) were not detected at all in the samples. Fifty one percent of the calculated aggregate risk is based on risk associated with three compounds, not found in the sewage sludge samples and that will not be created in the process of combustion. Furthermore, organic compounds not detected in the sampling at concentrations below the detection limits were assigned emission levels that corresponded to the detection limit concentrations. This *overstates* THC emissions because the true level is below the detection limit and may be significantly lower or non-existent. Moreover, organic compounds that were not detected in the samples were still assumed to be emitted by an incinerator. The emission level assigned for these compounds is either the detection limit value or average values based on detection limits for other compounds. Again, this represents an assumption that results in *overstatement of the level of risk*.

After calculating risk associated with sewage sludge incinerator emission for THC using the assumptions discussed above, for its "worst-case" scenario, the aggregate assessment increased these estimates by a factor of 5 to account for organic emissions from the stack that have not been identified or quantified. . . . Consequently, increasing the risk calculations by a factor of five *overstates risk* to the extent that the unaccounted for and unquantified portion of the emissions' stream does not include carcinogenic organics."

Id. at 9306 (emphasis added).

As fully supported above, current regulation of SSIs under the Part 503 Regulations is overly conservative and clearly protective of public health and the environment. Moreover, the statutory framework of this regime establishes two separate means to identify and regulate additional concerns with the incineration of sewage sludge if such concerns are supported by scientific evidence -- (1) Round II of the Part 503 Regulations and (2) biennial review of Part 503 Regulations. The Agency's contention that additional regulation of SSIs under Section 129 is appropriate to protect public health is simply not supportable.

V. Practical Impacts of Regulation of SSIs under Section 129 of the CAA -- Unachievable Emission Limits And Negligible Beneficial Impact

The practical significance of regulation of SSIs under Section 129 is of the utmost concern to AMSA. The actual impact of this regulation on human health and the environment will, at best, be negligible, while the added cost to the rate payers to achieve compliance with proposed standards will be substantial.

A. Unachievable Emission Limits

The Agency's proposed regulation of SSIs under Section 129 could result in the elimination of incineration of sewage sludge even though the Agency has declared that incineration is a safe and acceptable sewage sludge disposal method, and Congress has expressed its intent that choice of sewage sludge disposal

methods is to be determined at the local level.

POTW operators may find it is either cost prohibitive or technically infeasible to simultaneously meet the proposed standards for carbon monoxide (CO) and oxides of nitrogen (NOx). Agency personnel have indicated that the NOx MACT Standard could be 5 pounds per dry ton while the CO MACT Standard could be 100 ppm. Based upon these numbers and as the Agency has done for other MACT rules, it appears that the Agency intends to identify the "best performing units" on a pollutant-by-pollutant basis, meaning that it intends to select the best performing 12% of all SSIs with regards to NOx, the best performing 12% of all SSIs with regards to SO₂, and so forth.

While AMSA believes that EPA lacks authority to establish MACT Standards by combining the most stringent limits achieved separately for each listed pollutant, AMSA has a more fundamental technical concern premised on the fact that NOx emissions and CO emissions from SSIs are inversely related. As NOx emissions increase, CO decreases and consequently, as CO increases NOx decreases. It should be noted that in order to reduce THC and CO emissions, the top hearth temperature is increased. Since additional fuel is needed to raise the temperature, additional NOx is released to the atmosphere. On the other hand, if the top hearth temperature is lowered, NOx emissions decrease, while THC and CO emissions increase.

Based on data collected by AMSA, NOx and CO emission levels from SSIs vary significantly among SSIs across the nation, independent of the type of incinerator. As a result of this variation and the inverse relation, if a MACT Standard is established separately for NOx and separately for CO, it is highly likely that few if any SSIs will be able to comply with both standards, thereby resulting in the elimination of incineration -- an Agency-approved biosolids management option.

Such a result would be contrary to Congress' expressed intent under Section 405 of the CWA, in which Congress mandates that the Agency is to provide for safe management practices for the use and disposal of sewage sludge, not to dictate "preferred" practices and eliminate others. Section 405(e) of the CWA states that "[t]he determination of the manner of disposal or use of sludge is a local determination," as long as the practice is in accordance with the Agency's regulations. Congress clearly did not intend to limit the availability of safe sewage sludge management options.

Even in light of Congress' expressed intent, however, an unreasonable implementation of Section 129 standards for SSIs is bound to reach a contrary result.

B. Negligible Beneficial Impact

As previously discussed, SSIs are currently regulated under the Part 503 Regulations, which are risk-based standards (as opposed to technology-based standards imposed by Section 129 of the CAA). In addition, SSIs are subject to New Source Performance Standards under 40 CFR Part 60, Subpart O, and a National Emission Standard for Mercury. In areas where Particulate Matter, NOx, and/or SO₂ are a problem, states can and do impose RACT Standards on SSIs in the impacted area if they constitute a major source of such

March 17, 1997

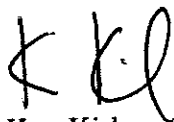
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pollutant. States also have authority to further regulate air emissions from SSIs through their other SIP provisions. In addition, the Agency has already acknowledged that SSIs are very minor sources of dioxin and dibenzofurans. Accordingly, the Agency should focus its efforts and resources on finding ways to control emissions from "major sources" of dioxin and dibenzofurans and *not* SSIs.

Assuming that the Agency's prior extensive SSI risk analysis remains valid, and there is no evidence to the contrary, only one conclusion is possible -- the Agency's stated intention to promulgate SSI regulations under Section 129 is with the Agency's full knowledge that the beneficial impact of these regulation on human health and the environment may be negligible. No benefit, therefore, will be realized from the expensive and/or infeasible control measures that Section 129 will mandate. Moreover, the funds that would be dedicated to satisfy the requirements imposed by Section 129 would generate much greater environmental benefits if they were, instead, directed towards those projects for which there is a demonstrated cost/benefit advantage.

AMSA wishes to thank the United States Environmental Protection Agency for this opportunity to submit comments on the Notice of Additional Information, dated January 14, 1997, concerning SSIs. If you have any questions or require additional information concerning AMSA's position on this issue, please do not hesitate to contact Robert P. Dominak, Vice-Chair AMSA Biosolids Management Committee at 216-881-6600, or Sam Hadeed, AMSA Headquarter's Staff at 202-833-4655.

Sincerely yours,



Ken Kirk
Executive Director

cc: Bob Perciasepe, EPA-HQ
Mike Cook, EPA-HQ
Mary Nichols, EPA-HQ
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AMSA Incineration Workgroup

August 14, 2006

EPA Docket Center (EPA/DC)
United States Environmental Protection Agency
U.S. EPA (MD-6102T)
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Re: Comments of the National Association of Clean Water Agencies (NACWA) on U.S. EPA's Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration Units: Reconsideration

Attention Docket ID No. EPA-HQ-OAR-2003-0156

Dear Sir or Madam:

These comments are submitted on behalf of the National Association of Clean Water Agencies ("NACWA")¹ in support of the United States Environmental Protection Agency's ("U.S. EPA" or the "Agency") determination that sewage sludge incinerators ("SSIs") are not subject to regulation as other solid waste incineration units ("OSWIs") pursuant to Section 129 of the Clean Air Act ("CAA"). NACWA submits these comments in response to U.S. EPA's June 28, 2006 notice of its reconsideration of, and requests for public comments on, the issue of whether SSIs should be excluded from the CAA § 129 regulations for OSWIs promulgated on December 16, 2005 (the "final OSWI rule").²

While NACWA understands and supports U.S. EPA's efforts to ensure a full opportunity for public comment in its rulemaking process, NACWA respectfully submits that U.S. EPA has already properly determined — after thorough evaluation and analysis — that SSIs are not subject to regulation as OSWIs under CAA § 129. This determination is the result of 10 years of notice and comment rulemaking, judicial challenges and negotiations involving all interested parties. Additional public comment during reconsideration is not expected to generate new information. As such, this process should only serve to reinforce U.S. EPA's decision to exclude SSIs from the final OSWI rule to preserve incineration as a safe, viable, and cost-effective biosolids (or "sewage sludge") management practice consistent with the intent of Congress and U.S. EPA. Accordingly,

¹ NACWA (formerly the Association of Metropolitan Sewerage Agencies or AMSA) represents the interests of nearly 300 publicly owned wastewater treatment agencies or works (POTWs) nationwide. NACWA's members serve the majority of the sewered population in the United States, and collectively treat and reclaim more than 18 billion gallons of wastewater each day.

² See *Standards of Performance for New Stationary Sources and Emissions Guidelines for Existing Sources: Other Solid Waste Incineration Units: Reconsideration*, 71 Fed. Reg. 36726 (June 28, 2006); *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration Units; Final Rule*, 70 Fed. Reg. 74870 (Dec. 16, 2005).

NACWA strongly supports U.S. EPA's decision not to include SSIs among the categories of OSWIs regulated under the final OSWI rule.

GENERAL COMMENTS

1. NACWA's Public Agency Members Rely on Incineration as a Safe, Effective, and Federally-Approved Biosolids Management Practice.

NACWA represents the interests of the country's wastewater treatment agencies, true environmental practitioners that serve the majority of the sewered population in the United States, and collectively treat and reclaim more than 18 billion gallons of wastewater each day. For over thirty-six years, NACWA has maintained a leadership role in issues affecting POTWs, and has been at the forefront of the development and implementation of scientifically-based, technically-sound, and cost-effective environmental programs for protecting public and ecosystem health.

The approximately 16,000 POTWs located in the United States utilize U.S. EPA-approved methods to manage the estimated eight million dry metric tons of biosolids that are generated annually as a product of their wastewater treatment activities. These approved methods include incineration. As U.S. EPA has repeatedly stated, the Agency does not have a position regarding the biosolids management options most suitable for a particular community and, instead, recognizes that such choices are local decisions (subject, of course, to applicable federal and state regulations).³ U.S. EPA also stated that it continues to support incineration (as well as land application, and disposal at municipal solid waste landfills and disposal at surface disposal sites) as a viable option for the management of biosolids.⁴

The incineration of biosolids results in an 80-95% reduction in volume, the effective destruction of pathogens, the degradation of toxic organic compounds, and the production of a sanitary, odorless, and non-hazardous by-product (*i.e.*, ash). Incineration is thus an important, safe, and effective component of the biosolids management practices utilized by POTWs. U.S. EPA has estimated that, in 1998, up to 22% of biosolids generated at POTWs located within the United States is disposed of through incineration.⁵ Using this and other available surveys, NACWA has estimated that 17% of the biosolids generated by U.S. POTWs is presently managed through incineration.

³ Letter from Benjamin H. Grumbles, then Acting Assistant Administrator for the Office of Water, U.S. EPA, to Scott Hassett, Secretary of Wisconsin Department of Natural Resources dated October 7, 2004 (attached hereto at Attachment B) ("we do not believe that EPA should be involved in determining the biosolids management practices most suitable for a particular community"); James A. Hanlon, Director of U.S. EPA Office of Wastewater Management, to Greg Kester, State of Wisconsin Department of Environmental Resources dated September 20, 2004 (attached hereto at Attachment C).

⁴ *See id.*

⁵ *See* United States Environmental Protection Agency, *Biosolids Generation, Use, and Disposal in the United States* 26-27 (1999) (EPA No. 530R-99-009), available at www.epa.gov/epaoswer/non-hw/compost/biosolid.pdf.

2. U.S. EPA's Decision Not to Regulate SSIs under CAA § 129 was Reached After Thorough and Complete Evaluation of the Issue.

Given the importance of incineration to NACWA members and the non-member POTWs that practice incineration, NACWA has been an active participant in U.S. EPA's evaluation of the emissions from sewage sludge incineration and the Agency's regulatory actions related to SSIs. During this process, NACWA has cooperatively provided U.S. EPA with data and other information about its members' biosolids incineration activities and the level and types of pollutants released during this process in order to assist the Agency in evaluating the applicability of CAA §§ 129, 112(d), and 112(k). NACWA has also been heavily involved in U.S. EPA's development of the existing regulations under the CAA and Clean Water Act ("CWA") pertaining to emissions from POTWs and SSIs, including 40 CFR Part 503 (Standards for the Disposal of Sewage Sludge) and 40 CFR Part 63, Subpart VVV (National Emissions Standards for Hazardous Air Pollutants: Publicly Owned Treatment Works).

NACWA's history of involvement in this specific regulatory issue spans nearly a decade, beginning with U.S. EPA's notice of its initial intent to include SSIs as a category of OSWIs under CAA § 129(a)(1)(E).⁶ In response to U.S. EPA's notice, NACWA (then named the Association of Metropolitan Sewerage Agencies or AMSA) and many of its individual member agencies provided extensive comments to U.S. EPA, which explained in detail the many reasons that SSIs should not be included as OSWIs under CAA § 129. As discussed in NACWA's March 17, 1997 comment letter, these reasons include:

- (i) The regulation of SSIs under Section 129 is beyond the U.S. EPA's statutory authority;
- (ii) U.S. EPA's contemplated method for establishing Maximum Achievable Control Technology ("MACT") Standards for SSIs under Section 129 would lead to results contrary to the intent of Congress – i.e., it would lead to the elimination of biosolids incineration (a safe, viable and cost-effective sewage sludge management practice);
- (iii) The properties of biosolids are very different from those of hazardous, medical or municipal solid wastes. Thus, SSIs should not be subject to the same type of regulations imposed on these other types of incinerators;
- (iv) The emissions from SSIs are already subject to comprehensive and stringent regulations that are protective of human health and the environment. U.S. EPA has determined that, through compliance with the Part 503 limits and management practices under the CWA, emissions from SSIs do not adversely affect human health and the environment; and
- (v) Accordingly, no environmental benefit will be realized from the expensive and/or infeasible control measures that Section 129 will impose, and there may be a net loss of environmental benefit.

⁶ *New Source Performance Standards and Emissions Guidelines: Sewage Sludge Incinerators*, 62 Fed. Reg. 1868 (Jan. 14, 1997).

NACWA's March 17, 1997 comments to U.S. EPA remain fully applicable to the issues raised by U.S. EPA's current reconsideration of the final OSWI rule, and are accordingly attached hereto as Attachment A and incorporated by reference.

Following the close of the public comment period in 1997, U.S. EPA evaluated NACWA's and other interested parties' comments, conducted legal analysis, and further studied SSIs. This process was completed, in part, through the Industrial Combustion Coordinated Rulemaking Advisory Committee convened under the Federal Advisory Committee Act ("FACA") on which NACWA member agencies participated extensively and provided their technical expertise and experience. During this three year process, NACWA and its member agencies provided U.S. EPA with significant information regarding its members' biosolids incineration activities and the emissions released during this process. After U.S. EPA's full evaluation and consideration of the applicability of Section 129 to SSIs, U.S. EPA properly determined that SSIs should not be regulated under CAA § 129 because they do not constitute "solid waste incineration units." U.S. EPA accordingly announced that decision in its semiannual regulatory agenda for 2000.⁷ U.S. EPA reiterated this determination when it announced in November 2000 that the Agency would complete the CAA § 129 regulations for OSWIs by November 15, 2005, and confirmed the sources that would be covered by the OSWI rulemaking – tellingly, SSIs were not among those sources.⁸

Further demonstrating its intent not to regulate SSIs under CAA § 129, U.S. EPA provided an express exemption from the final CAA § 129 rules promulgated in December 2000 for commercial and industrial solid waste incinerators. SSIs complying with 40 CFR Part 60, Subpart O (Standards of Performance for Sewage Treatment Plants) are expressly excluded from this incinerator rule.⁹

⁷ United States Environmental Protection Agency, *Unified Agenda, April 2000 Agenda of Regulatory and Deregulatory Actions*, 65 Fed. Reg. 23430, 23460 (April 24, 2000). In the regulatory agenda, U.S. EPA expressly stated:

The Agency has decided not to regulate sewage sludge incinerators as a category under Section 129 of the Clean Air Act. Section 129(a)(1) requires the Agency to establish standards under Section 129 for each category of "solid waste incineration units." "Solid waste incineration unit" is defined as a "distinct operating unit of any facility which combusts any solid waste material from commercial or industrial establishments or the general public (including single and multiple residences, hotels, or motels)." The Agency believes that sewage sludge generated by publicly-owned treatment works (POTWs) and combusted in SSIs is "solid waste." However, this sludge is from a municipal source, and not from "commercial or industrial establishments or the general public." Therefore, *SSIs that combust this sludge are not "solid waste incineration units" and section 129 does not apply to them.* Virtually all of the SSIs that would be candidates for regulation combust sludge from POTWs, and thus are not covered under Section 129.

⁸ *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources for Other Solid Waste Incinerator Units*, 65 Fed. Reg. 67357 (Nov. 9, 2000).

⁹ *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units*, 65 Fed. Reg. 75338, 75351 (Dec. 1, 2000); *see also* 40 CFR § 60.2020(m).

NACWA also intervened in support of U.S. EPA in the litigation initiated by Sierra Club (the petitioner for this reconsideration proceeding) in federal court in 2001 to compel the Agency to issue performance standards and other requirements under CAA § 129 for OSWIs.¹⁰ In the legal filings and discussions in this lawsuit, NACWA again explained that U.S. EPA had already made a determination not to regulate SSIs under CAA § 129 and, therefore, the Agency was not required to promulgate performance standards or other requirements for SSIs under that section of the CAA. While this litigation resulted in a settlement in which U.S. EPA agreed to establish a schedule for promulgating the standards for OSWIs under CAA § 129, the settlement did not alter or affect the Agency's earlier determination that SSIs are not an OSWI category subject to regulation under Section 129(a)(1)(E).

U.S. EPA accordingly did not include SSIs among the categories of OSWIs in the proposed OSWI rule in December 2004 or in the final rule in December 2005.¹¹ U.S. EPA's basis for doing so was clear — the Agency had already made clear that it determined that SSIs were not a category of OSWIs subject to regulation under CAA § 129. While Sierra Club contends in its petition for reconsideration that there was no opportunity to comment on U.S. EPA's decision not to include SSIs in the OSWI proposed rulemaking, EarthJustice did in fact comment on this specific issue in its comment letter on the proposed OSWI rule.¹² In response to EarthJustice's comment, U.S. EPA again articulated that, as early as April 2000, the Agency indicated that it no longer intended to regulate SSIs under CAA § 129 and made clear that it intended to instead regulate SSIs under CAA § 112 to the extent that additional regulation beyond 40 CFR Part 503 is required.¹³

Given this extensive regulatory history, NACWA believes the various rulemaking activities taken by U.S. EPA over the past decade related to this issue firmly establish that U.S. EPA has already thoroughly considered whether SSIs are subject to regulation as OSWIs under CAA 129, and has reasonably and appropriately determined that they are not. Nevertheless, in light of U.S. EPA's reconsideration of this issue, NACWA provides the following additional comments in further support of U.S. EPA's proper determination that SSIs are sufficiently regulated under other regulatory programs.

¹⁰ *Sierra Club v. Whitman et al.*, Case No. 1:01CV01578 (D.D.C.).

¹¹ *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration Units: Proposed Rule*, 69 Fed. Reg. 71472 (Dec. 9, 2004); *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration Units: Final Rule*, 70 Fed. Reg. 74870 (Dec. 16, 2005).

¹² See Comments of EarthJustice, page 4 (Docket No. EPA-HA-OAR-2003-0156-0070) (Feb. 7, 2005).

¹³ *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration (OSWI) Units: Summary of Public Comments and Responses*, pages 57-58 (Docket No. EPA-HQ-OAR-2003-0156-0104).

SPECIFIC COMMENTS

1. U.S. EPA Properly Exercised its Discretion Under the CAA in Reasonably Determining that SSIs Should Not Be Included as a Category of OSWIs in the Final OSWI Rule.

U.S. EPA was well within its discretion to exclude SSIs from the final OSWI rule. Congress expressly directed U.S. EPA to regulate certain categories of incineration enumerated in Sections 129(a)(1)(A)-(D) of the Act. The statute does not define the categories of "other" solid waste incineration units that must be regulated under CAA § 129(a)(1)(E). Therefore, inherent in U.S. EPA's implementation of CAA § 129 is the discretion for the Agency to reasonably define what constitutes the statutorily undefined "other categories" of solid waste incineration units and then determine which of those categories warrant regulation under CAA § 129.

This conclusion is firmly supported by the text of CAA § 129. Notably, while the statute provides firm timelines for the promulgation of standards and other requirements for specifically identified categories of solid waste incinerators (*e.g.*, municipal waste incinerators, commercial and industrial waste incinerators, and hospital and medical waste incinerators), the CAA then only states that U.S. EPA must publish a *schedule* for the promulgation of standards for statutorily undefined "other categories of solid waste incineration units." CAA § 129(a)(1)(E). Thus, CAA § 129 plainly does not require U.S. EPA to promulgate OSWI standards for "every" or "all" possible categories of solid waste incineration units, without any consideration of the size of the incinerator or its impact on public health and the environment.

An interpretation of CAA § 129 that would include all solid waste incineration units is not only inconsistent with the statutory language, but is also illogical because it would require U.S. EPA to expend a tremendous amount of federal Agency resources to develop MACT standards for every category of such units, regardless of the level of actual emissions from the units. Congress simply could not have required this result by merely directing U.S. EPA to publish a schedule for the promulgation of standards applicable to "other categories" of solid waste incineration units.

Moreover, if Congress truly intended such far-reaching consequences, the legislature would have provided that directive to U.S. EPA within the text of CAA § 129(a)(1)(E). In other words, Congress would have instructed U.S. EPA to regulate "all" or "every" other category of solid waste incineration units. To the contrary, such an intent by Congress is noticeably absent in the text of CAA § 129 or its legislative history. As discussed below, the legislative history actually indicates that, in drafting CAA § 129, Congress was primarily concerned with regulating incinerators burning municipal waste. Congress did not direct U.S. EPA to regulate SSIs or any other specific type of incinerators under the OSWI category.

For all of these reasons, Section 129 is clearly ambiguous with respect to the "other categories" of solid waste incineration units that must be regulated under CAA § 129(a)(1)(E). Congress' instructions to the Agency to publish a schedule for the promulgation of standards for "other categories" of solid waste incineration units, therefore, inherently includes the authority for U.S. EPA to reasonably delineate which categories of

incinerators should be subject to regulation as OSWIs. U.S. EPA properly exercised that authority by collecting and analyzing information regarding potential OSWIs and ultimately concluding that SSIs should not be regulated as a category of OSWIs. As discussed below, this determination was a reasonable exercise of U.S. EPA's discretion under the Act.

A. U.S. EPA's Regulation of SSIs under CAA § 112 Prevents the Regulation of SSIs under CAA § 129.

As an initial matter, U.S. EPA can not include SSIs among the categories of OSWIs to be regulated by the final OSWI rule because U.S. EPA has already determined that SSIs are more properly regulated under CAA § 112. Section 129(h)(2) clearly states that: "no solid waste incineration units subject to performance standards under [Sections 129 and 111] shall be subject to standards under [Section 112(d)]." Thus, the language of Section 129(h) makes clear that U.S. EPA's regulation of sources under CAA § 129 or CAA § 112 must be mutually exclusive. As U.S. EPA has rationally concluded, any unit that is subject to CAA § 112 standards can not be subject to CAA § 129.

SSIs are subject to regulation under CAA § 112, as U.S. EPA has already identified SSIs as an area source category under CAA § 112. After initially listing SSIs as a hazardous air pollutant ("HAP") "source category" under CAA § 112, U.S. EPA subsequently determined that the SSI category did not have any sources with the potential to emit HAPs at a level approaching major source levels.¹⁴ In 2002, U.S. EPA then included SSIs as an additional area source category under CAA §§ 112(c)(3) and 112(k)(3)(B)(ii).¹⁵ Since area source categories are subject to the promulgation of emission standards under CAA § 112(d), SSIs may not also be subject to regulation under § 129.

B. Emissions from SSIs and POTWs are Already Stringently Regulated.

U.S. EPA's decision not to regulate SSIs as OSWIs under CAA § 129(a)(1)(E) is also reasonable and appropriate given that emissions from SSIs are already heavily regulated by other Congressionally-mandated, comprehensive regulations that are adequately protective of human health and the environment. Accordingly, no public health or environmental benefit will be realized from the expensive control measures that CAA § 129 would impose if SSIs were erroneously included in the final OSWI rule.

Since 1993, POTWs that practice incineration have been subject to a comprehensive, risk-based program for reducing the potential environmental risks of sewage sludge pursuant to Section 405 of the CWA

¹⁴ See *National Emission Standards for Hazardous Air Pollutants: Revisions of Source Category List under Section 112 of the Clean Air Act*, 67 Fed. Reg. 6521 (Feb. 12, 2002).

¹⁵ See *National Emission Standards for Hazardous Air Pollutants: Revisions of Area Source Category List under Sections 112(c)(3) and 112(k)(3)(B)(ii) of the Clean Air Act*, 67 Fed. Reg. 43112 (June 26, 2002).

and the implementing regulations set forth in 40 CFR Part 503 (Standards for the Use or Disposal of Sewage Sludge). Section 405(d) of the CWA requires EPA to establish numeric limits and management practices that protect public health and the environment from the adverse effects of toxic pollutants in biosolids. Section 405(e) of the CWA prohibits any person from disposing of biosolids from a POTW or other treatment works treating domestic sewage through any use or disposal practice for which regulations have been established pursuant to Section 405, except as in compliance with the Part 503 regulations.

In the Part 503 regulations, U.S. EPA has identified the pollutants in biosolids that may adversely affect public health or the environment and has specified the management practices for the utilization and disposal of biosolids that are protective of public health and the environment. For disposal by incineration, the Part 503 regulations require, among other requirements:

- (i) numerous management practices and general requirements;
- (ii) risk-based, site-specific limits for arsenic, cadmium, chromium, lead, and nickel content in the biosolids incinerated;
- (iii) compliance with National Standards for Hazardous Air Pollutants (NESHAPs) for mercury and beryllium (as discussed below);
- (iv) operational emission limits for total hydrocarbon (THC) or an alternative emission limit for carbon monoxide (CO); and
- (v) monitoring, recordkeeping and reporting requirements.

See 40 CFR Part 503, Subpart E.

Furthermore, in the course of developing the Part 503 regulations, U.S. EPA also proposed to establish requirements for dioxins (including specific congeners of dioxin, dibenzofuran, and coplanar PCBs).¹⁶ However, after evaluating the emissions of dioxins from biosolids incineration, as well as surface disposal and land application, U.S. EPA decided such requirements were not warranted.¹⁷ This decision was based on the results of a comprehensive risk assessment that demonstrated that dioxin levels in biosolids and biosolids incinerator exhaust gases do not pose a significant risk to human health or the environment.¹⁸

As explained in detail in NACWA's 1997 comments (pages 15-17), the numeric emission limits and management practices requirements established under the Part 503 regulations were derived from years of study and evaluation of the potential risks to human health and the environment which could be posed by the

¹⁶ See *Standards for the Use or Disposal of Sewage Sludge: Proposed Rule*, 64 Fed. Reg. 72045 (Dec. 23, 1999).

¹⁷ See *Standards for the Use or Disposal of Sewage Sludge: Final Notice*, 66 Fed. Reg. 66028 (Dec. 21, 2001).

¹⁸ See *id.*

incineration of biosolids. The regulation of SSIs under this existing regime are risk-based standards which were developed to protect human health and the environment from any reasonably anticipated adverse effects from pollutants that may be present in biosolids. As a result, SSIs can clearly demonstrate that the emissions from their units are *not* adversely impacting human health and the environment by demonstrating compliance with the Part 503 requirements. Moreover, the statutory framework of this regime provides for ample means for U.S. EPA to identify and regulate additional concerns if supported by scientific evidence. For example, CWA Section 405 provides for a biennial review process that was specifically established for identifying and regulating any additional pollutants of concern. U.S. EPA has repeatedly emphasized its confidence that the Part 503 regulations are adequately protective of public health and the environment.¹⁹

Additionally, since 1975, U.S. EPA has imposed NESHAPs for mercury and beryllium emissions which apply to certain SSIs. *See* 40 CFR Part 61, Subpart E and C. The mercury NESHAP applies, in relevant part, to any source that incinerates wastewater treatment plant sludge and imposes emission limits for mercury, as well as imposes stack testing, sampling, and monitoring requirements. *See* 40 CFR Part 61, Subpart E. The beryllium NESHAP applies, in relevant part, to incinerators which process beryllium-containing waste and imposes emission limits for beryllium, as well as sampling requirements. *See* 40 CFR Part 61, Subpart C. These NESHAPs are expressly incorporated into the 40 CFR Part 503 requirements for POTWs.

Since 1974, U.S. EPA has also imposed New Source Performance Standards (NSPS) for SSIs under CAA § 111. *See* 40 CFR Part 60, Subpart O. These regulations apply to any incinerator constructed or modified after June 11, 1973 that 1) combusts wastes containing more than 10% sludge (dry basis) produced by municipal sewage treatment plants; or 2) charges more than 1,000 kg (2,205 lbs.) per day municipal sewage sludge (dry basis). *See* 40 CFR § 160.150. Under the existing NSPS for SSIs, regulated incinerators must comply with emission limits for particulate matter and opacity, as well as operational, monitoring, testing and reporting requirements.

Thus, of the eleven pollutants identified in CAA § 129, many are already directly regulated under Parts 503, 60, or 61, including total particulate matter, opacity, lead, cadmium, mercury, and CO (optional, as a surrogate for THC). *See* CAA § 129(a)(4). Additionally, U.S. EPA and NACWA have both also determined that SSIs are only very minor sources of several other of the CAA § 129 pollutants, including dioxins, sulfur dioxide, and hydrogen chloride. NACWA's March 17, 1997 comment letter (pages 13-14) documents in detail many specific examples of existing SSI regulations, or information regarding emissions from SSIs, for each of the pollutants listed in Section 129.

In addition to the federal requirements applicable to SSIs outlined above, public agencies operating SSIs are also required to obtain a Title V operating permit if they are "major sources" as defined by the CAA. Pursuant to 40 CFR Part 403, POTWs additionally implement, through local regulatory authority, pretreatment standards to prevent discharge of pollutants to the POTW that may pass through or interfere with treatment processes. Pretreatment is an effective way to reduce harmful constituents in the biosolids combusted by SSIs.

¹⁹ *See* Letter from James A. Hanlon, Director of U.S. EPA Office of Wastewater Management, to Greg Kester, State of Wisconsin Department of Environmental Resources, dated September 20, 2004 ("EPA believes that 40 CFR Part [503] regulations are protective of public health and the environment and we continue to support biosolids management in full compliance with the Part 503 regulation.") (attached hereto as Attachment C).

States also have authority to regulate and, in fact, do regulate air emissions from SSIs under their respective CAA State Implementation Plans. Together, these federal, state, and local regulations form an existing and effective regulatory scheme for regulating emissions from SSIs. Further regulation of SSIs under Section 129 is not appropriate or necessary for the protection of public health and the environment.

C. Regulation of SSIs under CAA § 129 Would Result in Prohibitive Costs and Only Negligible Beneficial Impacts.

U.S. EPA's decision not to include SSIs among the categories of OSWI covered by the final OSWI rule is also supported by an analysis of costs and benefits. The additional regulatory burdens imposed under CAA § 129 would be substantial to SSI operators, while offering no discernable corresponding benefits. The added costs then imposed upon POTW ratepayers would be considerable, and could potentially lead to the elimination of incineration as a biosolids management option for many communities.

Cost would invariably increase under CAA § 129 as SSI operators face competing MACT standards for pollutants that cannot be simultaneously achieved (e.g., NO_x and CO). For further discussion *see* NACWA's 1997 comment letter (pages 17-19).

An overwhelming cost or regulatory burden on SSIs would be inconsistent with U.S. EPA's declarations that incineration is a safe and acceptable biosolids disposal method. It would also be contrary to the congressional intent expressed in Section 405 of the CWA, in which Congress mandates that U.S. EPA must provide for safe management practices for the use and disposal of biosolids, and not to dictate "preferred" practices and eliminate others. For example, Section 405(e) of the CWA states that "[t]he determination of the manner of disposal or use of sludge is a local determination," as long as the practice is in accordance with U.S. EPA's regulations.

For all of these reasons, NACWA believes that U.S. EPA has properly interpreted CAA § 129, and reasonably exercised its discretion not to regulate SSIs as OSWIs pursuant to CAA § 129(a)(1)(E).

2. U.S. EPA Properly Determined that SSIs are Not "Solid Waste Incineration Units" and, Therefore, Are Not Subject to Regulation Under CAA § 129.

Section 129 of the CAA requires U.S. EPA to develop and adopt new source performance standards and emissions guidelines for "solid waste incineration units." Therefore, the potential scope of incineration units covered by Section 129 is expressly limited by the definition of "solid waste incineration units." In CAA § 129(g)(1), Congress expressly defined this term to mean:

a distinct operating unit of any facility which combusts any solid waste material from any commercial or industrial establishments or the general public (including single and multiple residences, hotels, and motels). . . .

CAA § 129(g)(1). As fully explained below (as well as in NACWA's March 17, 1997 comment letter), biosolids generated by POTWs is not a "solid waste," nor is it "from commercial or industrial establishments or the general public." Simply stated, incinerators which combust biosolids from POTWs are not "solid waste incineration units" and do not fall within the scope of U.S. EPA's duty to regulate pursuant to Section 129.

A. Sewage Sludge Is Not from Commercial or Industrial Establishments or the General Public.

As U.S. EPA has previously determined, SSIs are not subject to regulation under CAA § 129 because the biosolids combusted by SSIs are generated at POTWs, rather than from "commercial or industrial establishments or the general public." POTWs are not, contrary to the arguments advanced in petitioner's request for reconsideration, properly characterized as "commercial or industrial establishments." The fact that the sewered population served by a POTW is assessed a monetary rate for the collection and treatment services provided by the POTW does not transform it into a "commercial establishment" within the commonly understood meaning of that term, which must presumably be the meaning intended by Congress in CAA § 129(g)(1). Moreover, the fact that Congress and NACWA refer to POTWs as "plants" or "facilities," or that they refer to their works collectively as an "industry," does not transform POTWs into "industrial establishments" within any reasonable interpretation of the term.

Moreover, the careful phrasing employed by Congress in the definition of "solid waste incineration unit"—"solid waste material *from commercial or industrial establishments or the general public (including single and multiple residences, hotels, and motels)*"—unambiguously indicates that not every category of incineration units is subject to regulation under CAA § 129. Indeed, if Congress had intended that incinerator units that burn solid waste material from *any* source would be regulated by CAA § 129, it would have simply stated that intention. In other words, Congress would not have added this second phrase which limits the scope of Section 129 to the specific waste sources of "commercial or industrial establishments or the general public." The inclusion of such language by Congress was purposeful; CAA § 129(g)(1) cannot be read in such a manner that would render this limiting language meaningless.

Finally, while untreated domestic sewage may originate at "commercial or industrial establishments or the general public," it is not a solid waste when it comes "from" these establishments. As discussed below, untreated domestic sewage is expressly excluded from the definition of "solid waste." Thus, under CAA § 129(g)(1), SSIs cannot be properly characterized as incinerating a solid waste coming *from* commercial or industrial establishments or the general public. Even if the CAA is deemed ambiguous on this point, *Chevron U.S.A., Inc. v. Natural Resource Defense Council, Inc.*, 467 U.S. 837 (1984), directs that we defer to U.S. EPA's reasonable interpretation of ambiguous statutory terms. Certainly, U.S. EPA's reading of the CAA § 129 as excluding SSIs from Section 129 because the biosolids that they combust are generated at POTWs and do not "come from" commercial or industrial establishments or the general public is a reasonable exercise of Agency discretion.

B. Sewage Sludge Is Not a Solid Waste.

While NACWA acknowledges that U.S. EPA has previously stated that it believes otherwise, NACWA respectfully maintains that the biosolids generated by POTWs and combusted in SSIs is not a "solid waste" for purposes of the definition of "solid waste incineration unit" provided in CAA § 129(g)(1). "Solid waste" is defined in Section 129 of the CAA by reference to the definition of "solid waste" under the Solid Waste Disposal Act (which is generally referred to as the Resource Conservation and Recovery Act or "RCRA").²⁰

RCRA defines "solid waste" as:

any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage . . .*

RCRA § 1004(27) (emphasis added). Sewage sludge from POTWs is exempt from the definition of "solid waste" as "solid or dissolved material in domestic sewage." This exception is commonly referred to as the "Domestic Sewage Exclusion" under RCRA. In fact, both Congress and U.S. EPA have expressly interpreted the definition of "waste" under RCRA to exclude POTW sewage sludge pursuant to the Domestic Sewage Exclusion.

While the legislative history of Section 129 of the CAA is silent as to the definition of "solid waste" (other than, as discussed below, Congress was primarily concerned with *municipal* solid waste), the Domestic Sewage Exclusion had been written into RCRA for 25 years at the time Congress passed the 1990 CAA Amendment. Accordingly, in incorporating RCRA's definition of "solid waste" in Section 129, Congress was well aware of the Domestic Sewage Exclusion encompassed in the definition of "solid waste."

Moreover, shortly after Congress passed the 1990 CAA, Congress amended RCRA to expand the scope of the Domestic Sewage Exclusion to cover Federally Owned Treatment Works. At the time of passage of this amendment (and after a year of debate and revision), Senator Chafee clearly confirmed Congress' understanding that the Domestic Sewage Exclusion exempts POTW sludge from RCRA regulation:

Sewage treatment plants operated by local governments - POTWs - have a special exemption called the domestic sewage exclusion under RCRA. *If most of the waste received by a POTW is domestic sewage, their sludge and wastewater is exempt from hazardous industrial waste regulation even if they are also receiving hazardous industrial waste through sewer connections.*

138 Cong. Rec. 514755, 514758 (September 23, 1992) (emphasis added). Accordingly, in using the limited definition of "solid waste" under RCRA for purposes of defining the scope of Section 129, Congress was aware that POTW sewage sludge would be excluded from the Section 129(g) definitions, which, in turn, would

²⁰ CAA § 129(g)(6) ("The term 'solid waste' shall have the meaning established by the Administrator pursuant to the Solid Waste Disposal Act.")

exclude regulation of SSIs under Section 129. Express exemption of SSIs under the definition of "Solid Waste Incineration Units" under Section 129 would have been redundant.

U.S. EPA has similarly interpreted the scope of the Domestic Sewage Exclusion to include sewage sludge generated by POTWs. The clearest example of this exclusion of POTW sewage sludge from the definition of "solid waste" under RCRA is found in U.S. EPA's promulgation of a rule to identify and list hazardous wastes for petroleum refinery process wastewaters. In the Preamble to the Final Rule (November 2, 1990), U.S. EPA concluded that POTW sewage sludge falls within the Domestic Sewage Exclusion:

These wastes [P038 and K048 wastes] are being added to the list of [hazardous] wastes . . . in order to regulate sludges generated at wastewater treatment facilities on site at petroleum refineries as well as sludges generated at off-site wastewater treatment facilities.¹⁴

...

¹⁴ It should be noted 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* and are not included in today's listings.

55 Fed. Reg. 46354, 46364 (November 2, 1990) (emphasis added).

Accordingly both Congress and U.S. EPA interpret the definition of "solid waste" under RCRA to exclude POTW sewage sludge pursuant to the Domestic Sewage Exclusion. Therefore, POTW sewage sludge is not "solid waste" as defined by RCRA, and incinerators which combust POTW sewage sludge do not qualify as "solid waste incineration units" under Section 129.

C. The Legislative History of CAA § 129 Further Indicates that SSIs Were Not Intended To Be Regulated as "Solid Waste Incineration Units."

The legislative history of CAA § 129 is fully consistent with the conclusion that SSIs do not constitute solid waste incineration units. The provisions now codified in Section 129 of the CAA originated in a bill entitled "Municipal Waste Combustion Control Act of 1989," introduced in Congress on January 25, 1989. The express purpose of the proposed legislation was to address the "garbage crisis" facing the nation in the late 1980s – "the unseemly aspects of the growing garbage crisis - garbage washing upon ocean beaches, a garbage barge sailing the Caribbean for weeks in search of a disposal facility."²¹

The bill further explained that Congress' underlying objective was to "establish the needed regulatory program to make *municipal waste incineration* an environmentally sound part of our Nation's waste

²¹ 135 Cong. Rec. S289-01 (Jan. 25, 1989).

management.”²² While subsequent legislative history reveals Congress’ concern with other specific, large incinerators other than municipal waste combustors (*e.g.*, medical waste incinerators and industrial incinerators burning waste paper, wood, yard wastes, food wastes, batteries and plastics), Congress did not once mention POTW sewage sludge or SSIs, or even hint that its concerns over the incineration of municipal solid waste extended to the incineration of sewage sludge.

In sum, Congress did not intend SSIs to be subject to Section 129 regulation. While Congress provided U.S. EPA with authority to identify categories of OSWIs, it limited the scope of U.S. EPA’s authority in this regard to incinerators which combust “solid waste” as defined under RCRA and only solid waste “from commercial or industrial establishments or the general public.” SSIs do not fall within this definition, and therefore, cannot be regulated under Section 129 of the CAA. The plain language of Section 129, as further validated by the legislative history of CAA § 129, supports no other conclusion.

CONCLUSION

NACWA strongly believes that U.S. EPA has reasonably determined that SSIs are not subject to regulation under CAA § 129 and has, accordingly, properly excluded them from the scope of the final OSWI rule. NACWA urges U.S. EPA to maintain its current determination on this issue, and thanks U.S. EPA for the opportunity to submit comments in support of the Agency’s position.

²² 135 Cong. Rec. S556 (Jan. 3, 1989).

NACWA's Comments on EPA Reconsideration of Sewage Sludge Incineration

August 14, 2006

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If you have any questions or require additional information concerning NACWA's position on this issue, please do not hesitate to contact Robert P. Dominak, Co-Chair of NACWA Biosolids Management Committee, at 216-881-6600, or Alexandra Dapolito Dunn, NACWA General Counsel, at 202-833-2672.

Sincerely,

A handwritten signature in black ink, appearing to read "K Kirk", with a vertical red line to its right.

Ken Kirk
Executive Director

- Attachment A: NACWA's March 17, 1997 comments to U.S. EPA.
- Attachment B: Letter from Benjamin H. Grumbles, Acting Assistant Administrator of U.S. EPA, to Scott Hassett, Secretary of Wisconsin Department of Natural Resources dated October 7, 2004.
- Attachment C: Letter from James A. Hanlon, Director of U.S. EPA Office of Wastewater Management, to Greg Kester, State of Wisconsin Department of Environmental Resources dated September 20, 2004.

ATTACHMENT A

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Vice President
Cecil Lue-Hing
Metropolitan Water Reclamation
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Treasurer
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Executive Director
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Association of
Metropolitan
Sewerage Agencies

March 17, 1997

The Air and Radiation Docket
and Information Center (6102)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Attn: Docket No. A-96-42

Re: Association of Metropolitan Sewerage Agencies' Comments to January 14, 1997
Notice of Additional Information - U.S. EPA's Intent to Delist Sewage Sludge
(Biosolids) Incinerators from Major Source Classification under Section 112 of
CAA and to List Sewage Sludge Incinerators as Sources Subject to Regulation
under Section 129 of CAA

Dear Sir or Madam:

The Incineration Workgroup of the Association of Metropolitan Sewerage Agencies (AMSA) has completed its review of the United States Environmental Protection Agency's (Agency) "Notice of Additional Information" as published in the Federal Register on January 14, 1997 (62 FR 1868). In the Notice of Additional Information, the Agency declares its intent to delist Sewage Sludge Incinerators (SSIs) from the list of major sources of hazardous air pollutants (HAPs) under Section 112© of the Clean Air Act (CAA) and its intent to list SSIs as Other Solid Waste Incinerators (OSWIs) subject to regulation under Section 129 of the CAA.

AMSA fully understands and supports the Agency's intent to delist SSIs from the Section 112 list of major sources of HAPs since there is substantial evidence that SSIs do not qualify as "major sources" as defined under Section 112. However, AMSA strongly opposes regulation of SSIs under Section 129 of the CAA for the following reasons:

1. The regulation of SSIs under Section 129 is beyond the Agency's statutory authority;

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2. The Agency's contemplated method for establishing Maximum Achievable Control Technology (MACT) Standards for SSIs under Section 129 would lead to results contrary to the intent of Congress - i.e., it would lead to the elimination of sewage sludge incineration (a safe, viable and cost-effective sewage sludge management practice);
3. The properties of sewage sludge are very different from those of hazardous, medical or municipal solid waste. Thus, SSIs should not be subject to the same type of regulations imposed on these other types of incinerators;
4. The emissions from SSIs are already subject to comprehensive and stringent regulations that are protective of human health and the environment. The Agency has determined that, through compliance with the Part 503 limits and management practices, emissions from SSIs do not adversely affect human health and the environment; and,
5. Accordingly, no environmental benefit will be realized from the expensive and/or infeasible control measures that Section 129 will impose, and there may be a net loss of environmental benefit.

I. Incineration of Sewage Sludge

AMSA has over 170 members who own or operate approximately 700 Publicly Owned Treatment Works (POTWs), with members in more than 40 states and the District of Columbia. AMSA's 170 members are not limited to only large public agencies in major metropolitan areas but also include numerous smaller municipalities, with populations as low as 100,000. AMSA members utilize a number of Agency-approved methods, including incineration, to dispose of their sewage sludge in a safe and cost-effective manner.

At the present time, in excess of 20% of AMSA member agencies practice incineration, while the Agency has estimated, based on the 1988 National Sewage Sludge Survey, that approximately 16% of the sewage sludge removed from POTWs located within the United States is incinerated. Given the importance of incineration to AMSA members and the non-member POTWs that practice incineration, AMSA has closely monitored the Agency's actions in regulating SSIs, specifically the Agency's actions under Section 112 of the CAA and Section 405 of the Clean Water Act (CWA).

AMSA strongly disagrees with recent statements attributed to Agency personnel that incineration is not a preferred sewage sludge management option, and that incineration is the most costly means of sewage sludge disposal. This simply is *not* true for a number of communities and wastewater treatment agencies, especially for those agencies located in areas where available landfill space and agricultural application sites are scarce.

During an AMSA Incineration Workgroup meeting, held on January 22, 1997, a considerable number of Workgroup members indicated that due to the large quantity of sludge removed from the wastewater at their POTWs, their cost to incinerate is approximately one-half of the cost of landfilling and/or land

March 17, 1997

Page 3

application.

In addition, a study conducted by the Metropolitan Sewer District of Greater Cincinnati and the consulting firm of Black & Veatch suggests that the regulators' negative perception of incineration as a pollution source is unfounded when compared to other sewage sludge disposal options. Their findings were outlined in a paper entitled "Incineration - The Green Alternative? Comparison of Air Emissions with Other Solids Handling Processes" which was presented at the Water Environment Federation's 1996 Biosolids Management Conference.

AMSA believes that EPA's recent proposed change in direction toward regulating SSIs under Section 129 of the CAA, instead of Section 112, will have a significant *negative* impact on its members and other POTWs that practice incineration, while it will have a *negligible* beneficial impact on human health and the environment, or could even have a negative impact.

II. Standards for the Use and Disposal of Sewage Sludge (40 CFR Part 503)

AMSA is concerned that public and Agency personnel misperception with regards to current regulation of the incineration of sewage sludge is leading the Agency to stray from the comprehensive regulatory framework authorized by Congress under Section 405 of the CWA (above and beyond the historic CAA regulations applicable to all sources) that is directly focused on safe and effective management of sewage sludge, including incineration. Unlike some other types of incinerators, Congress has already mandated comprehensive, stringent regulation aimed specifically at use and disposal of sewage sludge, including incineration.

Since 1993, POTWs that practice incineration have been subject to SSI air emission limits pursuant to Section 405 of the CWA and its implementing regulations under the Agency's Sewage Sludge Disposal Regulation (40 CFR Part 503). For more than four years, these POTWs have dedicated significant time and expenditures to comply with the Part 503 Regulations. These Regulations include (1) numeric emission limits for arsenic, beryllium, cadmium, chromium, lead, mercury and nickel; (2) a Total Hydrocarbon (THC) or alternative carbon monoxide (CO) emission limit; (3) and numerous requirements regarding management practices.

The numeric emission limits and management practices requirements established under the Part 503 Regulations were derived from years of study and evaluation of the potential risks to human health and the environment which could be posed by the incineration of sewage sludge. As more fully detailed below, the regulation of SSIs under this existing regime are risk-based standards which were developed to protect human health and the environment from any reasonably anticipated adverse effects from pollutants that may be present in sewage sludge. *See generally* Section 405(d) of the CWA. As a result, owners/operators of SSIs can clearly demonstrate that the emissions from their units are *not* adversely impacting human health and the environment by demonstrating compliance with the Part 503 limits.

Prior to the promulgation of the Part 503 Regulations, the only emission limits placed directly upon

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SSIs were for total particulate matter and mercury. However, with the promulgation of the Part 503 Regulations and the required air emissions performance testing, the performance of SSIs has been enhanced. For example, the vast majority of AMSA members that practice incineration have confirmed the Agency's initial findings that the emissions of the newly regulated metals from their SSIs could be minimized by limiting the maximum combustion zone temperature, while the emissions of organic compounds can be reduced by increasing the incinerator's exhaust gas temperature, although at a substantial additional cost.

The existing regulatory regime established by Section 405 of the CWA and the implementing Part 503 Regulations is extremely conservative and more than adequately protects human health and the environment from potential adverse affects identified with the disposal of sewage sludge by incineration. The conservative nature of the Part 503 Regulations is exemplified by the fact that the Regulations are based on exposure to the Highly Exposed Individual (HEI) over 70-continuous years.

Moreover, the statutory framework of this regime provides for ample means of identifying and regulating additional concerns if supported by scientific evidence. In particular, Section 405 provides for Round II evaluations and biennial review specifically established for identifying and regulating any additional pollutants of concern. See Section 405 of the CWA. These conclusions are fully supported by the Agency's determinations made in promulgating the Part 503 Regulations. (See Section IV.B).

III. AMSA Supports Delisting of SSIs under Section 112 of the Clean Air Act

AMSA fully supports the Agency's intent to delist SSIs from the categories of major sources subject to Section 112 regulation. AMSA has provided EPA with scientific evidence that SSIs do not qualify as "major sources" as defined under Section 112 (sources that emit more than 10 tons per year (tpy) of any single HAP or 25 tpy of any combination of HAPs).

Section 112 of the CAA requires the Agency to identify and list categories of "major sources" of HAPs, which will then be subject to Maximum Achievable Control Technology (MACT) Standards promulgated for each category. On June 21, 1991, the Agency initially published a draft list of major sources of HAPs which included SSIs. 56 FR 28548. This list was published as final on July 16, 1992, and again identified SSIs as a major source of HAPs. 57 FR 31576.

At the time of the initial listing, SSI operators did not have complete data to evaluate the appropriateness of EPA's classification of SSIs as "major sources." However, upon notice of EPA's decision to regulate POTWs and SSIs under Section 112, AMSA's Air Quality Committee conducted an extensive survey that determined that less than 30 of the 189 listed Hazardous Air Pollutants (HAPs) are found in the influent to POTWs. The Ohio Air Quality Development Authority (AQDA) conducted additional study at two POTWs to determine which of the HAPs detected in the POTW influent were also detected in SSI stack emissions. This data was provided to the Office of Air & Radiation and revealed that 20 or less of the 30 HAPs found in POTW influent were detected in the stack emissions from the sample SSIs.

AMSA also evaluated the HAP emission data for SSIs contained within *AP-42: Compilation of Air Emission Factors*, and *Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources*. While AMSA has not independently verified the data contained in these sources and the Agency has acknowledged that its confidence in some of the emission factors is low, this data used in combination with AMSA's data from the aforementioned studies, yields conservative emission information for a total of 69 of the 189 HAPs. Based on this combined data, the average aggregate emission factor for SSIs is 0.32 pounds of HAPs per dry US ton of sewage sludge incinerated.

Given the conservative 0.32 lb/dry US ton emission rate, a sewage sludge incinerator that burns 50,000 dry US tons per year (an extremely high annual through-put rate) would emit, at most, 8 tons of HAPs per year ($0.32 \text{ lb/ton} \times 50,000 \text{ tons} \div 2,000 \text{ lbs/ton}$), far below the 25 ton per year major source threshold.¹ However, the highest HAPs emission rate in the Ohio AQDA test was 0.071 lbs. per dry ton. Based on this rate, a sewage sludge incinerator that burns 50,000 dry tons per year would emit only approximately 1.78 tons of HAPs per year, less than one-tenth of the threshold. The results of the aforementioned analyses conclusively establish that SSIs do not qualify as "major sources" under section 112 of the CAA.

AMSA believes that the extremely low levels of HAPs being emitted from SSIs are a result of the limited number of HAPs entering the POTWs, the low concentrations of HAPs in wastewater, and the fact that SSIs are subject to the Part 503 Regulations.

First, pursuant to regulatory directives (i.e., the Agency's General and Categorical Pretreatment Regulations) and independent initiatives, POTWs have implemented aggressive pretreatment programs which have focussed on limiting the amount of hazardous materials discharged to the sewers and to POTWs from industrial users. For example, one of the AMSA members has reported that over the last 20 years it has seen a 90% decrease in metals entering its plants due to its aggressive pretreatment program. In addition, the 1988 National Sewage Sludge Survey reveals that the General and Categorical Pretreatment Regulations have been successful.

Second, for compliance with the Part 503 metal limits, owner/operators of sewage sludge incinerators have found that by limiting their maximum combustion zone temperatures, they have been able to minimize metal emissions.

Third, with implementation of practices to control THC from SSI stack emissions to satisfy the Part 503 requirements, SSI operators have effectively controlled the emission levels of HAPs from SSIs. THC emissions correlate with organic emissions, and thus, THC is regulated as a surrogate for controlling the combination of all organic emissions. Accordingly, by controlling the level of THC emissions from SSIs, organic emissions are similarly controlled, including emission of those organics identified as HAPs under

¹ In other words, a POTW would have to incinerate over 150,000 tons per year of sewage sludge to even approach the 25 ton per year threshold ($0.32 \text{ lb/ton} \times 150,000 \text{ tons} \div 2,000 \text{ lbs/ton} = 24 \text{ tpy}$). AMSA is not aware of any POTW with an incineration through-put at this level.

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Section 112(b) of the CAA.

As a result of these efforts, the HAPs emissions from SSIs have already been effectively reduced to levels that are well below the levels which trigger "major source" classification under Section 112.

Based on the foregoing demonstration that SSIs do not qualify as "major sources" under Section 112, AMSA strongly believes that the Agency's decision to delist SSIs from its categories of major sources is scientifically-based, and therefore, an appropriate action. Further, delisting SSIs is consistent with the Agency's past practices in addressing sources originally listed but later determined not to be major sources, as well as the Agency's current strategy for implementing Section 112. Specifically, on June 4, 1996, the Agency published notice of its decision to delist five major source categories (including Chromium Chemicals Manufacturing, Lead Acid Battery Manufacturing, Non-Stainless Steel Manufacturing - Electric Arc Furnace Operation, Stainless Steel Manufacturing - Electric Arc Furnace Operation, and Wood Treatment) and one area source classification (Asbestos Processing) from the original Section 112 list. The Agency's delisting decisions were based on the Agency's own initiative pursuant to authority provided in Section 112(c)(9) of the CAA.

The basis for each of EPA's major source delistings was that "available data no longer support the determination that any major sources are present in each category." EPA further explained that these sources were otherwise regulated under existing regulations. SSIs should be delisted for the same reasons.

The Agency's intent to delist SSIs from Section 112 major source categories is also consistent with the Agency's current strategy in implementing Section 112(c). In its Integrated Air Toxics Strategy, the Agency identifies its overall strategy as identifying priorities for emission reductions, including identifying where regulation is not needed.

Specifically, the Agency explained that "it is important to make use of the available information to insure that [the Agency] is not expending efforts on regulations that are not needed." The Agency further explained that "de-listing source categories" is an important tool "that should be used when justified by information currently available to [the Agency] or made available to [the Agency]."

In conclusion, since currently available scientific evidence supports a determination that SSIs do not qualify as a "major source" of HAPs under Section 112, SSIs should be delisted and should not be subject to MACT Standards under Section 112. The Agency's intent to delist SSIs from major source classification under Section 112 is appropriate.

IV. AMSA Opposes Regulation of SSIs under Section 129 of the CAA

Based on careful and extensive review and analysis, AMSA strongly urges the Agency to reevaluate its recently announced proposal to regulate SSIs under Section 129 of the CAA. While AMSA is not opposed to the regulation of SSIs, it is opposed to regulation of SSIs under Section 129, since such action: (1) is beyond the Agency's statutory authority; (2) is not necessary to protect human health and the environment and

could result in a net loss of these protections; and (3) could lead to results contrary to the intent of Congress that the choice of sludge disposal methods is to be made at the local level, by causing the elimination of sewage sludge incineration -- a safe, viable and cost-effective sewage sludge management option, which has been approved by the Agency.

A. The Agency Lacks Authority to Regulate SSIs under Section 129 of the CAA

Section 129 of the CAA requires EPA to establish "performance standards" and other requirements for each category of "Solid Waste Incineration Units." Section 129(a)(1)(A) of CAA. These standards "shall include emission limitations and other requirements applicable to new units and guidelines . . . and other requirements applicable to existing units." *Id.* The standards "shall reflect the maximum degree of reduction in emissions of air pollutants listed under [the statute] that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing units in such category." Section 129(a)(2) of the CAA.

AMSA strongly opposes the regulation of SSIs under Section 129 of the CAA. As an initial matter, AMSA disagrees with the Agency's underlying premise for its change in direction in regulating SSIs. The Agency's stated premise is that SSIs are more appropriately regulated under Section 129 than under Section 112. While AMSA recognizes that Section 129(h)(2)² precludes regulation of a source category under both Section 112 and 129, it does not follow that SSIs must or should be regulated under *either* Section 112 *or* Section 129, if there is no basis for such regulation.

SSIs cannot be regulated under Section 129 of the CAA because the Agency lacks statutory authority to include categories that are not within the definitions provided by Congress. Support for this is found in the Agency's own position (at least until recently) that it lacks authority to regulate SSIs under Section 129. Contrary to the Agency's insistence in the January 14, 1997 Notice, the Agency's failure to identify SSIs as a Section 129 source was not a mere "oversight." The Agency has directly addressed the issue of regulation of SSIs under Section 129 on more than one occasion and has expressly concluded that SSIs are not governed under Section 129.

Specifically, the Agency expressed its conclusion that SSIs are not governed under Section 129 in the Preamble to the final initial list of Section 112 major sources, wherein it explained that:

"The Agency interprets section 129(h)(2) to preclude the inclusion on today's list (or any revisions of this list) of solid waste incineration units combusting municipal waste, hospital waste, medical waste, infectious waste, commercial or industrial

² Section 129(h)(2) of the CAA states that "no solid waste incineration unit subject to performance standards under this section [§ 129] and section 7411 of this title [§ 111] shall be subject to standards under section 7412(d) of this title [§ 112]."

waste. The rationale for this is that section 129(a) specifically requires the Agency to promulgate standards for units combusting these particular wastes under section 111 and section 129. *The Agency interprets section 129 as not requiring standards to be promulgated for sewage sludge incineration units under section 129, so these units are included on today's [Section 112] list.*"

57 FR 31576, 31584 (July 16, 1992) (emphasis added). The Agency continued, stating that:

"Several commenters argued that sewage sludge incinerators should not be listed because they are already regulated under CWA and by NSPS and NESHAP's. In response, *the Agency does not consider sewage sludge incineration units to be covered under Section 129, so it has the authority to list and set standards for these units under Section 112. . . .*" *Id.*

EPA reiterated this determination in the February 19, 1993 Preamble to the Final Part 503 Regulations, in which it stated that "[a]t this time, the Administrator has decided that listing [SSIs as a major source] under [§ 112 of the CAA] is required by legislation." 58 FR 9248, 9277. If the Agency, at that time, had determined that SSIs were governed by Section 129, it would have been foreclosed from regulating them under Section 112. *See* Section 129(h)(2). The Agency continued to rely on its determination that SSIs are not governed by Section 129 in its draft and initial listings of Other Solids Waste Incinerators (OSWIs) under Section 129 where it did not list SSIs. *See* 58 FR 31358 (June 2, 1993) and 58 FR 5498 (November 2, 1993).

The Agency's failure to list SSIs as OSWIs regulated under Section 129 was not a mere "oversight," but instead was a rational Agency determination based on the correct statutory interpretation that SSIs do not fall within the scope of Section 129.

1. SSIs Do Not Fall Within the Scope of Section 129 of the CAA

AMSA believes that the Agency's original conclusion was the correct conclusion, and strongly disagrees with the Agency's "reevaluation" set forth in the Notice that "[s]ludge generated by POTWs is a solid waste from the general public, commercial and industrial establishments." As fully explained below, sludge generated by POTWs is neither a "solid waste," nor is it "from the general public, commercial and industrial establishments." Simply stated, incinerators which combust sewage sludge do not fall within the scope of Section 129.

Congress limited the scope of Section 129 in its definition of "solid waste incineration unit" which is defined as:

"a distinct operating unit of any facility which combusts [1] any solid waste material [2] from commercial or industrial establishments or the general public (including

single and multiple residences, hotels, and motels).³

Section 129(g)(1) of the CAA.

If POTW sewage sludge does not satisfy *both* of those requirements, SSIs cannot be regulated under Section 129. POTW sewage sludge does not satisfy either requirement under Section 129:

- (1) Sewage sludge is not a "solid waste," and
- (2) Sewage sludge is not from commercial, industrial or public sources.

a. **Sewage Sludge Is Not a Solid Waste**

"Solid Waste" is defined in Section 129 of the CAA by reference to the definition of "solid waste" under the Resource Conservation and Recovery Act (RCRA): "The term [] 'solid waste' . . . shall have the meaning[] established by the Administrator pursuant to the Solid Waste Disposal Act [commonly referred to as RCRA]." Section 129(g)(6) of the CAA. RCRA defines "solid waste" as:

"any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage . . .*"

42 U.S.C. § 6903(27) (emphasis added).

Sewage sludge from POTWs is exempt from the definition of "solid waste" as "solid or dissolved material in domestic sewage." This exception is commonly referred to as the "Domestic Sewage Exclusion" under RCRA. In fact, both Congress and the Agency interpret the definition of "solid waste" under RCRA to exclude POTW sewage sludge pursuant to the Domestic Sewage Exclusion.

³ The definition specifically excludes: (1) incinerators or other units which are Treatment, Storage and Disposal Facilities (TSDFs) under RCRA; (2) materials recovery facilities which combust waste for the primary purpose of recovering metals; (3) "qualifying small power production facilities" and "qualifying cogeneration facilities" which burn homogeneous waste (such as tires or used oil) for the production of electric energy or electric energy and steam or forms of useful energy; and (4) air curtain incinerators, provided that such incinerators burn only wood wastes, yard wastes, and clean lumber. *Id.*

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While the Legislative History of Section 129 of the CAA is silent as to SSIs, the Domestic Sewage Exclusion had been written into the solid waste statute for 25 years at the time Congress passed the 1990 Clean Air Act Amendments (CAAA). Accordingly, in adopting the definition of "solid waste" under RCRA for purposes of Section 129, Congress was well aware of the Domestic Sewage Exclusion encompassed in the definition of "solid waste."

Moreover, shortly after Congress passed the 1990 CAAA, Congress turned to amending the Solid Waste Disposal Act to expand the scope of the Domestic Sewage Exclusion to cover Federally Owned Treatment Works. At the time of passage of this amendment (and after a year of debate and revision), Senator Chafee clearly confirmed Congress' understanding that the Domestic Sewage Exclusion exempts POTW sludge from RCRA regulation:

"Sewage treatment plants operated by local governments - POTWs - have a special exemption called the domestic sewage exclusion under RCRA. If most of the waste received by a POTW is domestic sewage, their *sludge* and wastewater is exempt from hazardous industrial waste regulation even if they are also receiving hazardous industrial waste through sewer connections."

138 Cong. Rec. 514755, 514758 (September 23, 1992) (emphasis added). Accordingly, in using the limited definition of "solid waste" under RCRA for purposes of defining the scope of Section 129, Congress was aware that POTW sewage sludge would be excluded from the Section 129 definitions, which, in turn, would exclude regulation of SSIs under Section 129. Express exemption of SSIs under the definition of "Solid Waste Incineration Units" under Section 129 would have been redundant.

The Agency similarly interprets the scope of the Domestic Sewage Exclusion to include sewage sludge generated by POTWs. The clearest example of the Agency's exclusion of POTW sewage sludge from the definition of "solid waste" under RCRA is found in the Agency's promulgation of a rule to identify and list hazardous wastes for petroleum refinery process wastewaters. In the Preamble to the Final Rule (November 2, 1990), the Agency concludes that POTW sewage sludge falls within the Domestic Sewage Exclusion:

"These wastes [F038 and K048 wastes] are being added to the list of [hazardous] wastes . . . in order to regulate sludges generated at wastewater treatment facilities on site at petroleum refineries as well as sludges generated at off-site wastewater treatment facilities."¹⁴

FN14 "It should be noted 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* and are not included in today's listings."

55 FR 46354, 46364 (November 2, 1990) (emphasis added).

As fully supported above, both Congress and the Agency interpret the definition of "solid waste" under RCRA to exclude POTW sewage sludge pursuant to the Domestic Sewage Exclusion. Therefore, POTW sewage sludge is not "solid waste" as defined by RCRA, and incinerators which combust POTW sewage sludge do not qualify as "Solid Waste Incineration Units" under Section 129. Therefore, SSIs cannot be included in the scope of Section 129.

b. Sewage Sludge Is Not from Commercial, Industrial or Public Sources

Not only is sewage sludge not a "solid waste," it is not "from commercial or industrial establishments or the general public" and for that reason, also falls outside the second part of the definition of "Solid Waste Incineration Unit." Instead, sewage sludge is from the publicly owned treatment works at which it is generated. While the untreated domestic sewage may be from the specified sources, *untreated* domestic sewage (as well as the resulting sludge) is irrefutably excluded from the definition of "solid waste" under the Domestic Sewage Exclusion, as supported by EPA's own definition. See 40 CFR § 261.4.

Congress' careful phrasing of the definition -- "solid waste material from commercial or industrial establishments or the general public (including single and multiple residences, hotels, and motels)" -- strongly indicates that Congress intended that *some* category of incinerators be excluded from Section 129 regulation. If that category is not SSIs, AMSA has been unable to identify any other category which could possibly fall outside the definition.

Congress expressly identified certain categories of incinerators which it deemed to qualify as "Solid Waste Incineration Units," including incinerators which burn municipal garbage, medical wastes, and wastes from industrial and commercial processes. Section 129(a)(1) of the CAA. In addition, Congress gave the Agency authority to identify (and regulate) "other solid waste incinerators."⁴ *Id.* However, Congress did not give EPA unlimited authority to do so. If Congress had meant for Section 129 to apply to any incinerator that receives any sort of solid material, it would have simply stated so -- e.g., Congress would not have added this second phrase which limits the scope of Section 129 to that "from commercial or industrial establishments or the general public," nor would it have incorporated the definition of "solid waste" under RCRA.

2. Congress Intended to Regulate Municipal Waste Incinerators, Not SSIs

It is important to reiterate that the Legislative History of Section 129 is fully consistent with and

⁴ In fact, EPA has identified seven categories of OSWIs: (1) Small Municipal Waste Combustors (<35 mg/d capacity), (2) Residential Incinerators, (3) Agricultural Waste Incinerators, (4) Wood Waste Incinerators, (5) Construction and Demolition Waste Incinerators, (6) Crematories, and (7) Contaminated Soil Treatment Facilities. See 58 FR 58498 (November 2, 1993).

supportive of AMSA's analysis. The provisions now codified in Section 129 of the CAA originated in a bill entitled "Municipal Waste Combustion Control Act of 1989," introduced in Congress on January 25, 1989. The express purpose of the proposed legislation was to address the "garbage crisis" facing the nation in the late 1980s -- "the unseemly aspects of the growing garbage crisis -- garbage washing upon ocean beaches, a garbage barge sailing the Caribbean for weeks in search of a disposal facility." 135 Cong. Rec. S289-01 (January 25, 1989).

It is further explained that Congress' underlying objective was to "establish the needed regulatory program to make *municipal waste incineration* an environmentally sound part of our Nation's waste management. *Id.* Moreover, the origin of the pollutants regulated under Section 129 were those which Congress expressly identified with the incineration of *municipal solid waste* (not POTW sewage sludge) -- "Air pollutants of concern emitted by municipal waste incineration units include dioxin, lead and other heavy metals, sulfur dioxide, acid gases, carbon monoxide, and particulate matter." *Id.* (The initial list of pollutants of concern have remained substantially unchanged under Section 129 -- "particulate matter (total and fine), opacity (as appropriate), sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, dioxins and dibenzofurans.")

While the subsequent Legislative History reveals some concern with incinerators other than municipal waste combustors, those concerns of Congress were limited to medical waste incinerators and industrial incinerators burning waste paper, wood, yard wastes, food wastes, batteries and plastics. Importantly, however, the Legislative History of Section 129 does not once even mention POTW sewage sludge or SSIs, nor is there even a hint that Congress' concerns over the incineration of municipal solid waste extended to the incineration of sewage sludge.

Based on the foregoing, Congress did not intend SSIs to be subject to Section 129 regulation. While Congress provided the Agency with authority to identify categories of OSWIs, it limited the Agency's authority in this regard to incinerators which combust "solid waste" as defined under RCRA and only solid waste "from commercial or industrial establishments of the general public." SSIs do not fall within this definition, and therefore, cannot be regulated under Section 129 of the CAA. The statute simply does not provide the Agency with the authority to regulate SSIs under Section 129. Congressional intent supports no other conclusion.

B. Regulation of SSIs under Section 129 Is Not Necessary for the Protection of Public Health and the Environment

AMSA is specifically concerned that the Agency's recent change in direction is premised on public misperception of the protections established by current regulation of SSIs. AMSA's concern was heightened by the Agency's contention in the January 14 Notice of Additional Information that regulation of SSIs under Section 129 is appropriate to "assure the public that the SSI are being operated in a manner that will protect the public health." AMSA strongly disagrees with this contention.

1. SSIs Are Currently Stringently Regulated

As mentioned above, SSIs are currently regulated under Part 503 Regulations, which are risk-based standards (as opposed to technology-based standards imposed by Section 129 of the CAA). In addition, SSIs are subject to numerous other air emission regulations, including New Source Performance Standards for particulate matter and a National Emission Standard for mercury. Moreover, states have authority to regulate and in fact do regulate (where deemed appropriate) air emissions of priority pollutants -- particulate matter, SO₂, CO, NO_x, etc. -- from SSIs through their SIP provisions.

If SSIs were to be regulated under Section 129, the Agency would develop national numerical SSI emission limits (MACT Standards) for particulate matter (total and fine), opacity (as appropriate), sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, and dioxin and dibenzofurans. These standards are to be developed based on Maximum Achievable Control Technology (MACT), where emission limits are not less stringent than the average emissions limitation achieved by the best performing 12% of the SSIs in the United States.

These stringent limits are required under Section 129 regardless of whether *any* risks to human health or the environment exist. That is, Section 129 in some cases mandates huge expenditures to address non-existent problems.

As explained above, the pollutants set forth in Section 129 are those pollutants which Congress identified as concerns for municipal waste combustors, not SSIs. Moreover, SSIs are already regulated for a large number of pollutants which have been identified as concerns for SSIs specifically (some of them are the same as and some are different than the Section 129 pollutants), where risk to human health and the environment has been shown. Moreover, if additional restrictions, based on risk-based analyses, are deemed necessary, existing regulatory mechanisms are available.

An analysis of the current stringent regulation of SSIs in conjunction with the Congressional mandate for the 503 Regulations -- to adequately protect public health and the environment -- clearly establishes that further regulation of SSIs under Section 129 is not appropriate or necessary for protection of human health and the environment. Thus, AMSA believes that there is no rationale to subject SSIs to MACT Standards for the aforementioned pollutants.

Examples of existing SSI regulatory requirements for the pollutants listed in Section 129, or information on emissions from SSIs, are as follow:

1. For total particulate matter, all SSIs built after June 1973, or modified since that time, are subject to a New Source Performance Standards of 1.3 pounds of particulate (total) per dry ton of sludge incinerated. 40 CFR Part 60, Subpart O.
2. For fine particulate matter (currently PM₁₀), new or modified sources which are major emitters of PM are subject to stringent technology standards, either Lowest Achievable Emission Rate

(LAER) for non-attainment areas or Best Available Control Technology (BACT) for attainment areas. In addition, most states impose some level of control technology for new but smaller sources of PM (such as "Best Available Technology"). In addition, states can and do impose Reasonably Achievable Control Technology (RACT) Standards for existing sources which are determined to be major contributors of PM in impacted areas.

3. For opacity, states consistently impose limits, typically 20% opacity on a six minute average.
4. For Sulfur Dioxide, new or modified sources which are major emitters of Sulfur Dioxide are subject to stringent technology standards, either LAER for non-attainment areas or BACT for attainment areas. In addition, most states impose some level of control technology for new but smaller sources of Sulfur Dioxide. In addition, states can and do impose RACT Standards for existing sources which are determined to be major contributors of Sulfur Dioxide in impacted areas.
5. Hydrogen Chloride emissions from SSIs, while not regulated, are very small compared to emissions from other industries, and therefore constitute a nominal percentage of the total.
6. For Oxide of Nitrogen (NOx), new or modified sources which are major emitters of NOx are subject to stringent technology standards, either LAER for non-attainment areas or BACT for attainment areas. In addition, most states impose some level of control technology for new but smaller sources of NOx. In addition, states can and do impose RACT Standards for existing sources which are determined to be major contributors of NOx in impacted areas.
7. Carbon Monoxide (CO) has already been reduced by the addition of a THC emission limit under the Part 503 Regulations. In addition, the Agency is allowing CO to be used as a surrogate for THC, under the Part 503 Regulations.
8. The Part 503 Regulations already establish risk-based, site-specific SSI emission limits for cadmium and lead. (The Part 503 Regulations also established site-specific, risk-based limits for arsenic, chromium and nickel.)
9. The Part 503 Regulations require SSI emissions to satisfy the National Emission Standard for Hazardous Air Pollutants (NESHAPs) Standard for Mercury. 40 CFR Part 61, Subpart E.
10. AMSA and its consultant, Cambridge Environmental Inc., have determined through emissions performance testing, that SSIs emit less than 0.08% of the total dioxin/dibenzofurans released to the atmosphere each year, and the Agency concurs that SSIs are a very minor source of dioxin and dibenzofurans.

Clearly, SSIs are subject to comprehensive, stringent regulation. Further regulation under Section 129 is simply not necessary.

2. The Part 503 Regulations Ensure Protection of Public Health and the Environment

In combination, the existing regulations applicable to SSI air emissions, especially the Part 503 Regulations, are more than adequate to "assure the public that SSIs are being operated in a manner that will protect public health." The Part 503 Regulations were promulgated after years of study and evaluation of SSI emissions. As mandated by Congress, the Agency identified those pollutants "which, on the basis of available information on their toxicity, persistence, concentration, mobility or potential for exposure, may be present in sewage sludge in concentrations which may adversely affect public health or the environment." Section 405(d)(2)(A) of the CWA. Also, as mandated by Congress, the numerical emission limits and the management practices required by the Part 503 Regulations "are adequate to protect public health and the environment from any reasonably anticipated adverse effects of each pollutant." Section 405(d)(2)(D) of the CWA.

The Agency complied with these mandates, as it repeatedly assured the public in the Preamble to the Final Part 503 Regulations (February 19, 1993). For example, the Agency describes the Part 503 Regulations as requiring "an unprecedented effort to assess the potential for pollutants in sewage sludge to affect public health and the environment through a number of different routes of exposure." 58 FR at 9248. More directly, the Agency concluded that:

"EPA is confident that the regulations it is promulgating today adequately protect public health and the environment from all reasonably anticipated adverse effects, as required by section 405(d), for several reasons. First, EPA has evaluated its regulations for aggregate national health impact. As explained in more detail below, even given ***very conservative assumptions that probably overstate exposure***, there are virtually ***no effects*** when sludge is disposed of on the land or used as a soil conditioner or fertilizer in compliance with these rules. Further, even when sludge is incinerated and the population potentially exposed to the incinerator emissions is greater, the ***effects are small.***"

58 FR at 9249 (emphasis added). The Agency continued, explaining that:

"The Agency is comfortable that the regulations promulgated here are adequately protective because most of the effects that these regulations are designed to prevent are largely chronic, not acute ones. Even in the unlikely event that new information dictates reconsideration of some of the determinations on which EPA has based its health conclusions for this rule, there would be ***no adverse short-term human health consequences*** since standards to protect against chronic effects are well below acute effects levels."

Id. The Agency expressly concluded that:

"Therefore, the Agency has determined that today's rule meets the statutory directive

that the standards protect against reasonably anticipated adverse effects of the pollutants.”

Id. at 9252.

In addition, the Agency also used high standards for determining the impact of emissions from sewage sludge incinerators on human health:

“In all cases, EPA used cancer potency values corresponding to an incremental carcinogenic risk level of 1×10^{-4} to evaluate the risk from pollutants found in sewage sludge. (The exposure level of a pollutant associated with a 1×10^{-4} cancer risk implies that one additional cancer case will occur in a population of 10,000 exposed at that level for 70 years.) For purposes of establishing the numerical limits for incinerators promulgated today, EPA did, however, evaluate exposure at different incremental cancer risk levels (i.e., 1×10^{-4} through 1×10^{-6}). In the case of human health, the final limits for pollutants in sewage sludge ensure that the use and disposal of sludge does not result in ambient concentrations of the regulated pollutants that exceed an incremental carcinogenic risk level of 1×10^{-4} .”

Id. at 9254. In addition, for incineration, the metal and THC levels were “designed to ensure that ground level concentrations . . . did not exceed a value associated with protection of human health at a cancer risk level of 10^{-5} . *Id.* at 9266-67. To evaluate exposure, the Agency used an individual living in close proximity to a sewage sludge incinerator and assumed this individual “inhale[d] particulates and gases from the incinerator **24 hours per day, 365 days per year for 70 years.**” *Id.* at 9288 (emphasis added). The Agency further assumed that “this highly exposed individual is located at a point where the highest annual ground level concentration of incinerator emissions occurs.” *Id.* Clearly, the Agency developed the Part 503 standards using a very conservative scenario.

Moreover, the Agency used very conservative assumptions in the risk assessment for sewage sludge incineration, resulting in overstatement of the actual risk:

“ . . . the risk assessment for incinerator [sic] included **very conservative assumptions**. These assumptions yielded results that the Agency has concluded probably **overstate the risk** associated with current levels of sewage sludge incinerator organic emissions.

The risk assessment numbers are based on estimations of organic emissions from sewage sludge incinerators. In order to develop these estimations, **a number of very conservative assumptions** were made for both the best *estimate and worst case* scenarios, that probably results in **overstating THC emissions** for purposes of this analysis. These include assuming that *all* organic compounds that were sampled and analyzed for at seven sewage sludge incinerators . . . are present in the organic emissions of 172 POTW incinerators. In fact, the data establish that many of these

compounds (including aldrin/dieldrin and hexachlorobenzene) were not detected at all in the samples. Fifty one percent of the calculated aggregate risk is based on risk associated with three compounds, not found in the sewage sludge samples and that will not be created in the process of combustion. Furthermore, organic compounds not detected in the sampling at concentrations below the detection limits were assigned emission levels that corresponded to the detection limit concentrations. This *overstates* THC emissions because the true level is below the detection limit and may be significantly lower or non-existent. Moreover, organic compounds that were not detected in the samples were still assumed to be emitted by an incinerator. The emission level assigned for these compounds is either the detection limit value or average values based on detection limits for other compounds. Again, this represents an assumption that results in *overstatement of the level of risk*.

After calculating risk associated with sewage sludge incinerator emission for THC using the assumptions discussed above, for its "worst-case" scenario, the aggregate assessment increased these estimates by a factor of 5 to account for organic emissions from the stack that have not been identified or quantified. . . . Consequently, increasing the risk calculations by a factor of five *overstates risk* to the extent that the unaccounted for and unquantified portion of the emissions' stream does not include carcinogenic organics."

Id. at 9306 (emphasis added).

As fully supported above, current regulation of SSIs under the Part 503 Regulations is overly conservative and clearly protective of public health and the environment. Moreover, the statutory framework of this regime establishes two separate means to identify and regulate additional concerns with the incineration of sewage sludge if such concerns are supported by scientific evidence -- (1) Round II of the Part 503 Regulations and (2) biennial review of Part 503 Regulations. The Agency's contention that additional regulation of SSIs under Section 129 is appropriate to protect public health is simply not supportable.

V. Practical Impacts of Regulation of SSIs under Section 129 of the CAA -- Unachievable Emission Limits And Negligible Beneficial Impact

The practical significance of regulation of SSIs under Section 129 is of the utmost concern to AMSA. The actual impact of this regulation on human health and the environment will, at best, be negligible, while the added cost to the rate payers to achieve compliance with proposed standards will be substantial.

A. Unachievable Emission Limits

The Agency's proposed regulation of SSIs under Section 129 could result in the elimination of incineration of sewage sludge even though the Agency has declared that incineration is a safe and acceptable sewage sludge disposal method, and Congress has expressed its intent that choice of sewage sludge disposal

methods is to be determined at the local level.

POTW operators may find it is either cost prohibitive or technically infeasible to simultaneously meet the proposed standards for carbon monoxide (CO) and oxides of nitrogen (NOx). Agency personnel have indicated that the NOx MACT Standard could be 5 pounds per dry ton while the CO MACT Standard could be 100 ppm. Based upon these numbers and as the Agency has done for other MACT rules, it appears that the Agency intends to identify the "best performing units" on a pollutant-by-pollutant basis, meaning that it intends to select the best performing 12% of all SSIs with regards to NOx, the best performing 12% of all SSIs with regards to SO₂, and so forth.

While AMSA believes that EPA lacks authority to establish MACT Standards by combining the most stringent limits achieved separately for each listed pollutant, AMSA has a more fundamental technical concern premised on the fact that NOx emissions and CO emissions from SSIs are inversely related. As NOx emissions increase, CO decreases and consequently, as CO increases NOx decreases. It should be noted that in order to reduce THC and CO emissions, the top hearth temperature is increased. Since additional fuel is needed to raise the temperature, additional NOx is released to the atmosphere. On the other hand, if the top hearth temperature is lowered, NOx emissions decrease, while THC and CO emissions increase.

Based on data collected by AMSA, NOx and CO emission levels from SSIs vary significantly among SSIs across the nation, independent of the type of incinerator. As a result of this variation and the inverse relation, if a MACT Standard is established separately for NOx and separately for CO, it is highly likely that few if any SSIs will be able to comply with both standards, thereby resulting in the elimination of incineration -- an Agency-approved biosolids management option.

Such a result would be contrary to Congress' expressed intent under Section 405 of the CWA, in which Congress mandates that the Agency is to provide for safe management practices for the use and disposal of sewage sludge, not to dictate "preferred" practices and eliminate others. Section 405(e) of the CWA states that "[t]he determination of the manner of disposal or use of sludge is a local determination," as long as the practice is in accordance with the Agency's regulations. Congress clearly did not intend to limit the availability of safe sewage sludge management options.

Even in light of Congress' expressed intent, however, an unreasonable implementation of Section 129 standards for SSIs is bound to reach a contrary result.

B. Negligible Beneficial Impact

As previously discussed, SSIs are currently regulated under the Part 503 Regulations, which are risk-based standards (as opposed to technology-based standards imposed by Section 129 of the CAA). In addition, SSIs are subject to New Source Performance Standards under 40 CFR Part 60, Subpart O, and a National Emission Standard for Mercury. In areas where Particulate Matter, NOx, and/or SO₂ are a problem, states can and do impose RACT Standards on SSIs in the impacted area if they constitute a major source of such

March 17, 1997

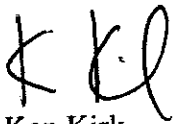
Page 19

pollutant. States also have authority to further regulate air emissions from SSIs through their other SIP provisions. In addition, the Agency has already acknowledged that SSIs are very minor sources of dioxin and dibenzofurans. Accordingly, the Agency should focus its efforts and resources on finding ways to control emissions from "major sources" of dioxin and dibenzofurans and *not* SSIs.

Assuming that the Agency's prior extensive SSI risk analysis remains valid, and there is no evidence to the contrary, only one conclusion is possible -- the Agency's stated intention to promulgate SSI regulations under Section 129 is with the Agency's full knowledge that the beneficial impact of these regulation on human health and the environment may be negligible. No benefit, therefore, will be realized from the expensive and/or infeasible control measures that Section 129 will mandate. Moreover, the funds that would be dedicated to satisfy the requirements imposed by Section 129 would generate much greater environmental benefits if they were, instead, directed towards those projects for which there is a demonstrated cost/benefit advantage.

AMSA wishes to thank the United States Environmental Protection Agency for this opportunity to submit comments on the Notice of Additional Information, dated January 14, 1997, concerning SSIs. If you have any questions or require additional information concerning AMSA's position on this issue, please do not hesitate to contact Robert P. Dominak, Vice-Chair AMSA Biosolids Management Committee at 216-881-6600, or Sam Hadeed, AMSA Headquarter's Staff at 202-833-4655.

Sincerely yours,



Ken Kirk
Executive Director

cc: Bob Perciasepe, EPA-HQ
Mike Cook, EPA-HQ
Mary Nichols, EPA-HQ
Tudor Davies, EPA-HQ
Bruce Jordan, EPA-RTP
Gene Crumpler, EPA-RTP
Cecil Lue-Hing, AMSA
Sam Hadeed, AMSA
Bob Dominak, AMSA
Ed Torres, AMSA
Dave Zenz, AMSA
John Distin, SS&D
AMSA Incineration Workgroup

ATTACHMENT B



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT - 7 2004

OFFICE OF
WATER

Mr. Scott Hassett
Secretary, Department of Natural Resources
101 S. Webster Street, Box 7921
Madison, WI 53707-7921

Dear Mr. ^{Scott}Hassett:

Thank you for your letter dated September 13, 2004, to Administrator Michael Leavitt. In your letter, you refer to a letter from Greg Kester to Jim Hanlon, Director, Office of Wastewater Management, concerning several biosolids management issues raised at a National State and Federal biosolids coordinators workshop. Your letter refers to a request for a statement reaffirming that the Environmental Protection Agency's (EPA) biosolids regulations are adequately protective of human health and the environment. You also requested that EPA reissue an official statement that beneficial use of biosolids through land application or public distribution is preferable to land filling or incinerator combustion.

Enclosed, please find a copy of Mr. Hanlon's letter which was sent in response to the issues raised by Greg Kester's letter. The regulatory baseline for the management of biosolids under the Clean Water Act is contained in the biosolids regulations at 40 CFR Part 503. The Part 503 regulations outline the use and disposal practices that publicly owned treatment works may select in their management of biosolids: land application, land filling or surface disposal and incineration. Based on the technical and scientific record, and as explained in the response to Greg Kester's letter, EPA believes that the 40 CFR Part 503 regulations are protective of public health and the environment.

As to the request that EPA should issue a statement favoring the beneficial reuse of biosolids over other uses, we do not believe that EPA should be involved in determining the biosolids management options most suitable for a particular community. Just as EPA does not require or expressly recommend that communities treat their wastewater to reuse standards and reuse it, or require particular technologies of municipal or industrial permittees to meet the

National Pollutant Discharge Elimination System permit limits, we do not require or expressly recommend that communities choose beneficial reuse of biosolids. EPA supports the reuse of wastewater and the beneficial reuse of biosolids as viable options available to communities, but firmly believes that any decisions regarding those choices are local decisions subject to meeting State regulations in addition to Federal regulations.

We appreciate your sharing of your concerns on this matter relative to biosolids management, and hope that this response addresses your concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Ben H. Grumbles". The signature is fluid and cursive, with the first name "Ben" being particularly prominent.

Benjamin H. Grumbles
Acting Assistant Administrator

ATTACHMENT C



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 20 2004

Mr. Greg Kester, PE
State Residuals Coordinator
State of Wisconsin, Department of Natural Resources
101 S. Webster Street, Box 7921
Madison, WI 53707-7921

OFFICE OF
WATER

Dear Mr. Kester:

Thank you for your letter dated July 30, 2004, sent with the concurrence of 43 State residuals coordinators. In the letter, you stated your concern and opinion that the Environmental Protection Agency (EPA) should abandon a position of neutrality on the methods for biosolids use or disposal. The letter also states that EPA should aggressively defend and support the safety of its regulations. In addition, the letter addresses a number of issues including previous EPA positions in promoting beneficial biosolids use, and statements by EPA regarding the safety of treating and managing biosolids. You also urge EPA to respond to requests from State and local governments to support specific biosolids management projects such as a heat drying project in Hawaii.

In order to address your concerns, it is important to first explain the roles that EPA, States and local governments are expected to play in implementing regulations such as the biosolids regulations. While we agree with your assessment that we are partner regulators in the biosolids program, we do not agree that EPA is in the position of determining the biosolids management options most suitable for a particular community. Just as EPA does not require or expressly recommend that communities treat their wastewater to reuse standards and reuse it, or require particular technologies of municipal or industrial permittees to meet the National Pollutant Discharge Elimination System permit limits, we do not require or expressly recommend that communities choose beneficial reuse of biosolids. EPA supports the reuse of wastewater and the beneficial reuse of biosolids as viable options available to communities, but firmly believes that any decisions regarding those choices are local decisions subject to meeting State regulations in addition to Federal regulations. EPA also believes that the States are capable of assessing compliance with Part 503 regulations. EPA is available for technical assistance and training as necessary for assessing compliance with the 503 regulations.

EPA believes that the 40 CFR Part regulations are protective of public health and the environment, and we continue to support biosolids management in full compliance with the Part 503 regulations. Your letter also urges EPA to aggressively defend and support the safety of its regulations. As I stated in a letter to your office dated November 2, 2003, EPA continues to support land application, incineration, and disposal in municipal solid waste landfills and surface disposal units in compliance with 40 CFR Part 503 as viable options for the use and disposal of biosolids. When we receive requests regarding the use of a particular technology or

use or disposal option at a particular site, such as in the Hawaii request, our position will be that it is protective of human health and the environment provided that the technology in question will be designed and implemented to comply with the Part 503 regulations.

EPA has shown a commitment to ensuring that the biosolids regulations are protective of public health and are periodically examined. Indeed, the Clean Water Act requires that the scientific basis of the part 503 Rule be periodically reassessed. Over the past decade, citizens and environmental organizations questioned the adequacy of the rules' chemical and pathogen standards for protecting public health. In order to responsibly address these concerns and confirm that the rule is adequately protective of public health and the environment, EPA commissioned the National Resource Council (NRC) of the National Academy of Sciences to independently review the scientific basis of the regulations governing the land application of biosolids. The NRC report issued in July 2002 concluded that, although there is no documented scientific evidence that the 503 regulations have failed to protect public health, further scientific work is needed to reduce persistent uncertainty about the potential for adverse human health effects from exposure to biosolids.

As part of EPA's continued commitment to the development of sound regulations, and following the recommendations in the NRC report, as well as public comments and input on research priorities from a Biosolids Research Summit held in June 2003 by the Water Environment Research Foundation, EPA developed a final action plan in December 2003. As you know, this plan includes determining potential risks of selected pollutants and conducting a targeted survey, and characterizing potential volatile chemicals and bioaerosols from land application sites. The agency expects to conduct a number of activities within the next two to three years with the goal of further strengthening the biosolids use and disposal program. It is through such activities that EPA will continue to address the uncertainty cited in the NRC report.

Thank you again for sharing your concerns and offering suggestions relative to biosolids management and the 40 CFR Part 503 regulations.

Sincerely,

A handwritten signature in dark ink, appearing to read "James A. Hanlon", is written over a large, light-colored circular mark.

James A. Hanlon
Director
Office of Wastewater Management



EXECUTIVE COMMITTEE
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Los Angeles, CA

EXECUTIVE DIRECTOR

Ken Kirk

February 2, 2009

EPA Docket Center (EPA/DC)
United States Environmental Protection Agency
U.S. EPA (2822T)
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Re: Comments of the National Association of Clean Water Agencies (NACWA) on U.S. EPA's Advanced Notice of Proposed Rulemaking, 74 Fed. Reg. 41 (January 2, 2009) Seeking Input on Defining "Solid Waste" as it Applies to Non-Hazardous Materials

Attention Docket ID No. EPA-HQ-RCRA-2008-0329

Dear Sir or Madam:

These comments are submitted by the National Association of Clean Water Agencies ("NACWA") in response to the United States Environmental Protection Agency's ("EPA's") January 2, 2009 request for public comments on the meaning of "solid waste" under the Resource Conservation and Recovery Act ("RCRA") published at 74 Fed. Reg. 41-61. NACWA asks that EPA clarify in its upcoming rulemaking that "solid waste" does not include the sewage sludge (biosolids) processed at Publicly Owned Treatment Works ("POTWs") that are the "solid and dissolved materials in domestic sewage" that Congress expressly exempts from its definition of solid waste at 42 U.S.C. § 6903(27). The solid waste definition rule presents an opportunity to clarify and codify that the statutory Domestic Sewage Exclusion applies to the sewage sludge extracted from domestic sewage and combusted or land applied. Express exclusion of POTW sewage sludge from the definition of solid waste is consistent with NACWA's position that sewage sludge incinerators ("SSIs") should be regulated under Section 112 instead of Section 129 of the Clean Air Act ("CAA").

NACWA represents the interests of nearly three hundred of the nation's POTWs, which collectively serve the majority of the sewered population in the United States. For over thirty-five years, NACWA has maintained a leadership role in legal and policy issues affecting clean water agencies, and has been at the forefront of the development and implementation of scientifically-based, technically-sound, and cost-effective environmental programs for protecting public and ecosystem health. Congress' Domestic Sewage Exclusion recognizes the unique function and purpose of

POTWs as distinct from other types of wastewater treatment. POTWs perform a necessary public function that protects the environment. From 1968 to 1995, POTWs served 35% more people while decreasing the biochemical oxygen demand of their discharges by 45% and significantly improving dissolved oxygen levels in 73% of major river basins. They also have made and continue to make significant strides in reducing contaminants and returning many watersheds to a condition acceptable for recreation. Without POTWs, the waste of approximately 190 million people living within their service areas would go untreated. POTWs have been, and continue to be, committed to serving their communities and improving environmental quality through compliance with the Clean Water Act ("CWA").

POTWs are authorized under the CWA to impose pretreatment obligations and other restrictions on dischargers to the sewer system. This enables POTWs to protect their treatment systems and helps ensure that the sewage sludge extracted meets the criteria necessary for future beneficial use.

Sewage sludge processed at POTWs must meet strict health-based standards established under the CWA. The CWA requires EPA to identify pollutants "which, on the basis of available information on their toxicity, persistence, concentration, mobility or potential for exposure, may be present in sewage sludge in concentrations which may adversely affect public health or the environment." CWA § 405(d)(2)(A), 33 U.S.C. § 1345(d)(2)(A). The numerical limits and management practices promulgated by EPA must be "adequate to protect public health and the environment from any reasonably anticipated adverse effects of each pollutant." CWA § 405(d)(2)(D). EPA proceeded to establish these health-based limits at 40 CFR Part 503 as the standards for the use or disposal of sewage sludge. When promulgating these standards, EPA used exposure assessment models with conservative assumptions that overstated risk to derive numerical pollutant limits that protect individuals from events that are likely to occur and to protect public health and the environment from the reasonably anticipated adverse effects of each pollutant. *See* 58 Fed. Reg. 9248, 9249, 9277 (Feb. 19, 1993).

When looking to update these health-based standards, EPA has various options. The agency could conclude, as courts have, that Congress intended POTW sewage sludge to be regulated comprehensively under the CWA. *See Natural Resources Defense Council v. EPA*, 790 F.2d 289 (3rd Cir. 1986) (directing EPA to meet the CWA's "command for a comprehensive framework to regulate the disposal and utilization of sludge ..."). The CWA requires that EPA review its sewage sludge regulations "from time to time but not less often than every two years ... for the purpose of identifying additional toxic pollutants and promulgating regulations for such pollutants." CWA § 405(d)(2)(D). EPA need not look beyond the CWA for its authority to comprehensively regulate the use and combustion of sewage sludge consistent with the best available scientific information.

EPA may also look to the Clean Air Act ("CAA") to regulate SSIs for health-based standards as it has already done for technology-based standards at 40 CFR Part 60, Subpart O. However, since Congress has declared the solid material in domestic sewage excluded from the definition of "solid waste," EPA should not look to CAA Section 129 to regulate sewage sludge combustion. Section 129 is limited to solid waste incinerators and as indicated above and explained more completely below POTW SSIs are not combusting solid wastes and should not be included in Section 129. If CAA regulation is required, NACWA prefers regulation of SSIs under Section 112 for hazardous air pollutants and that they be consistent with the Part 503(E) regulations under the CWA that protect human health and the environment. Previous EPA determinations have confirmed in 2005 and 2007 that SSIs are more appropriately regulated under Section 112 instead of Section 129.

NACWA asks that EPA clarify in its upcoming solid waste definition rule that “solid waste” does not include sewage sludge from the processing of domestic sewage. This will clarify the proper path for potential regulation of SSIs under Section 112 of the CAA.

General Comments

I. Sewage Sludges Processed at POTWs are Not a Solid Waste

A. The Resource Conservation and Recovery Act (“RCRA”) Expressly Excludes the Solid and Dissolved Material to be Processed at POTWs from the Definition of Solid Waste Through the Domestic Sewage Exclusion

The CAA defines solid waste by referencing the definition of solid waste under RCRA: “The term ‘solid waste’ . . . shall have the meaning established by the Administrator pursuant to the Solid Waste Disposal Act [commonly referred to as RCRA].” CAA § 129(g)(6). RCRA defines “solid waste” as:

any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage* . . .¹

42 U.S.C. § 6903(27) (emphasis added). This 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.”

B. The Domestic Sewage Exclusion Encompasses Sewage Sludge Processed at POTWs

Both Congress and EPA have stated that the Domestic Sewage Exclusion includes the sewage sludge processed at POTWs. After all, sewage sludges are simply the “solid and dissolved materials in domestic sewage” that are filtered and extracted during the wastewater treatment process. These are the very materials that the Domestic Sewage Exclusion is designed to exclude from solid waste regulation. Congress and EPA also have stated repeatedly that the Domestic Sewage Exclusion continues to apply to sewage sludge when a POTW treats non-domestic sources discharged into the domestic sewage system.

¹ The definition specifically excludes: (1) incinerators or other units which are Treatment, Storage and Disposal Facilities (TSDFs) under RCRA; (2) materials recovery facilities which combust waste for the primary purpose of recovering metals; (3) “qualifying small power production facilities” and “qualifying cogeneration facilities” which burn homogeneous waste (such as tires or used oil) for the production of electric energy or electric energy and steam or forms of useful energy; and (4) air curtain incinerators, provided that such incinerators burn only wood wastes, yard wastes, and clean lumber. *Id.*

1. Congress Has Explicitly Considered the Scope of the Domestic Sewage Exclusion and Concluded That the Exclusion Encompasses Sewage Sludge from the POTW Process.

During the 1992 RCRA Amendment process, Congress specifically considered the scope of the Domestic Sewage Exclusion in the context of hazardous waste regulation. At that time, Senator Chafee clearly confirmed that sewage sludge extracted from a domestic sewer system is covered by the Domestic Sewage Exclusion even when the system is receiving industrial wastewater through sewer connections:

Sewage treatment plants operated by local governments - POTWs - have a special exemption called the domestic sewage exclusion under RCRA. ***If most of the waste received by a POTW is domestic sewage, their sludge and wastewater is exempt from hazardous industrial waste regulation even if they are also receiving hazardous industrial waste through sewer connections.***

138 Cong. Rec. 514755, 514758 (1992) (emphasis added). Senator Chafee's statement is also reflected in the Senate reports of the Committee on Environment and Public Works during consideration of the 1992 RCRA Amendments:

"Currently, the volume of hazardous waste discharged to sewers in the U.S. is greater than the volume of hazardous waste that is managed in facilities regulated under subtitle C of RCRA. The material disposed in sewers is, however, not considered a hazardous waste because the definition of solid waste at section 1004(27) of RCRA ***excludes material that is mixed with domestic sewage.***"

S. REP. 102-301, at 91 (1992). The Committee further stated:

Although section 421 limits the domestic sewage exclusion for industrial discharges, it does not in any way change the status of the POTWs with respect to regulation under subtitle C. The amendment specifically provides that ***POTWs shall not be considered hazardous waste treatment, storage or disposal units, even if an industrial discharger should discharge a hazardous waste to the POTW in violation of the revised statute.***

S. Rep. 102-301, at 92 (1992) (emphasis added). EPA recognized this congressional intent to include indirect industrial discharges processed by POTWs within the Domestic Sewage Exclusion during its 1980 consideration of hazardous waste rules when it stated, "[t]he exclusion of domestic sewage and mixtures that pass through sewer systems to POTW's is based on Congressional intent" 45 Fed. Reg. 33084, 33098 (May 19, 1980). While these statements are all made in the context of hazardous waste regulation, they are no less relevant when crafting exclusions for solid waste under regulations for non-hazardous materials, as they refer to the Section 1004(27) statutory definition of solid waste which applies to both the hazardous waste (Subtitle C) and nonhazardous waste (Subtitle D) sections of RCRA. Congress has had ample opportunity to adjust the requirements of the CWA or to adjust the Domestic Sewage Exclusion, and it is significant that it has not done so.

2. Previous EPA Rulemakings Recognize the Congressional Intent that the Domestic Sewage Exclusion Includes Sewage Sludge from POTWs.

EPA has revisited the definition of solid waste many times during the development of hazardous waste regulations, and each time has incorporated the Domestic Sewage Exclusion into the regulatory definition of solid waste. *See* 40 C.F.R. § 240.101(y); 40 C.F.R. § 243.101(y); 40 C.F.R. § 246.101(bb); 40 C.F.R. § 257.2; 40 C.F.R. § 258.2; 40 C.F.R. § 261.4. EPA has repeatedly recognized the congressional intent that the Domestic Sewage Exclusion includes sewage sludge processed at POTWs and has regulated accordingly.

Perhaps the clearest example of EPA's exclusion of POTW sewage sludge from the definition of solid waste in reliance on the Domestic Sewage Exclusion under RCRA is found in EPA's promulgation of a rule to identify and list hazardous wastes for petroleum refinery process wastewaters. In the Preamble to the Final Rule (November 2, 1990), EPA concludes that POTW sewage sludge falls within the Domestic Sewage Exclusion:

It should be noted 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*** and are not included in today's listings.

55 Fed. Reg. 46354, 46364 (November 2, 1990) (emphasis added). EPA also has adopted the position that POTWs do not lose the Domestic Sewage Exclusion when they receive non-domestic wastes into their sewer system in the following definition of "solid waste" in the hazardous waste regulations:

The following materials are not solid wastes for the purpose of this subpart:
(1)(i) Domestic sewage; and (ii) ***any mixture of domestic sewage and other wastes that passes through a sewer system to a publicly-owned treatment works for treatment.***

40 C.F.R. § 261.4 (emphasis added). Both Congress and EPA have been clear about the scope of the Domestic Sewage Exclusion. The Exclusion specifically applies to domestic sewage, and includes the sewage sludge from POTWs that process domestic sewage with other wastes that pass through the domestic sewer system.

POTW sewage sludges have been consistently excluded from regulation as a solid waste under RCRA's scheme for protecting public health and the environment during the management of hazardous wastes. NACWA requests that EPA continue to exclude POTW sewage sludge from its definition of solid waste in its rule for the management of non-hazardous materials. This Domestic Sewage Exclusion should expressly extend to the sewage sludge from POTWs whose primary function is the treatment of domestic sewage.

C. Consistent with the Congressional Purpose for the Domestic Sewage Exclusion, EPA Should Regulate Sewage Sludge Comprehensively under the Clean Water Act

In the Domestic Sewage Exclusion, Congress is expressing its preference for comprehensive regulation of sewage sludge under the Clean Water Act. Summarizing the legislative history, EPA concluded that the Domestic Sewage Exclusion was included in the definition of solid waste because domestic sewage passing through POTWs was already adequately regulated under the CWA. *See* 45 Fed. Reg. 33084, 33097 (May 19, 1980) (EPA summarizing Congress' reasoning behind the Domestic Sewage Exclusion). Congress has revisited the definition of solid waste since then, and has consistently reaffirmed its conclusion that sewage sludge processed by POTWs are adequately regulated under the CWA and need not be regulated under RCRA. During the consideration of the 1992 RCRA Amendments, the Senate approved the continued application of the Domestic Sewage Exclusion in stating that "[t]he rationale for the domestic sewage exclusion is that this material is already regulated under the Clean Water Act." S. Rep. No. 102-301, at 91 (1992).

Consistent with that apparent legislative preference, EPA should defer to the CWA for comprehensive regulation of all potential environmental effects of sewage sludge. EPA has regulations that govern SSI emissions under Section 405 of the CWA promulgated at 40 CFR Part 503. As mandated by Congress, the Agency identified those pollutants "which, on the basis of available information on their toxicity, persistence, concentration, mobility or potential for exposure, may be present in sewage sludge in concentrations which may adversely affect public health or the environment." CWA § 405(d)(2)(A). Also, as mandated by Congress, the numerical limits and the management practices required by the Part 503 Regulations "are adequate to protect public health and the environment from any reasonably anticipated adverse effects of each pollutant." *Id.* § 405(d)(2)(d).

In carrying out this statutory mandate, EPA enacted Part 503 regulations and described them as requiring "an unprecedented effort to assess the potential for pollutants in sewage sludge to affect public health and the environment through a number of different routes of exposure." 58 Fed. Reg. 9248 (Feb. 19, 1993). Part 503 regulations for sewage sludge incineration currently impose numeric emission limits for arsenic, beryllium, cadmium, chromium, lead, mercury and nickel; total hydrocarbon or alternative carbon monoxide emission limits; and numerous requirements regarding management practices. These requirements are risk-based standards that EPA has determined to be adequate to protect human health and the environment. Congress has further directed that EPA revisit these regulations at least every two years to ensure that they remain adequate to protect public health and the environment.

Mindful of the congressional preference for comprehensive sewage sludge regulation, NACWA asks that EPA defer to the Part 503 regulations as the primary focus of health-based regulations for sewage sludge use and combustion. To the extent necessary to meet CAA obligations, EPA should regulate the combustion of POTW sewage sludge under Section 112 for hazardous air pollutants so as not to disrupt the historic legislative and regulatory exclusion of this sewage sludge from solid waste regulation.

Specific Comments

II. Supplementary Information to the Materials Characterization Paper for Wastewater Treatment Sludge

NACWA asks that EPA expressly differentiate wastewater treatment sludge and POTW sewage sludge in its rule by defining “wastewater treatment sludge” to exclude the sewage sludge generated from a Publicly Owned Treatment Works processing domestic sewage. Since POTW sewage sludge is excluded from the definition of solid waste, this material does not need to be reflected in EPA’s Materials Characterization Paper for wastewater treatment sludge.

Nonetheless, NACWA supports EPA’s attempt to be well informed about each of the secondary materials listed in the ANPR and provides the following supplementary information regarding the sewage sludge processed at POTWs below in support of that attempt.

NACWA is providing more recent contaminant information from POTW sewage sludge than what exists in the Materials Characterization Paper. The Materials Characterization Paper contains data from 1980 and 1989. There has been a major improvement in biosolids quality since 1980 due to EPA’s Pretreatment and Biosolids Programs. NACWA supplies the following information generated from two POTWs owned and operated by the Northeast Ohio Regional Sewer District.

Reduction in Pollutant Concentrations in Sewage Sludge (1980 – 2004)		
Pollutant	Southerly WWTP	Westerly WWTP
Cadmium	96%	100%
Chromium	91%	92%
Copper	67%	91%
Lead	88%	98%
Nickel	87%	98%
Zinc	76%	89%

In addition, the mercury concentrations at both plants are less than 1 mg/dry kg, while the beryllium concentrations at both plants do not exceed 0.3 mg/dry kg.

These values demonstrate that the concentration of compounds of concern in sewage sludge has decreased significantly since 1980. This in turn indicates that the controls put in place for POTWs under Section 405 of the CWA are working. It also indicates that some pollutants, such as lead, are less prevalent in the environment due to other regulatory changes such as the elimination of lead from gasoline and paint.

It should be noted that many POTWs that incinerate their sewage sludge capture and reuse the excess heat in their incinerator exhaust gases. For example, by turning the excess heat from incinerator exhaust gases into high pressure steam used in plant processes and for building comfort heat, utilities are able to reduce their external energy consumption and carbon footprints. SSIs may also co-generate electricity to maximize energy recovery from sewage sludge. It is appropriate, therefore, to consider the fuel value of sewage sludge. When comparing sewage sludge with other fuels, as was done for “sludge incineration” in Exhibit 5 to the Waste Characterization Paper for Wastewater Treatment Sludge, EPA should utilize the most recent available data particularly with regard to lead and other metals that have been reduced significantly over time.

NACWA encourages EPA to use the most up to date and accurate data available as the basis for its rulemaking efforts. The 1980 and 1989 data for sewage sludge significantly overstate the risk associated with today’s

sewage sludge management. Similarly, the 1998 source for Exhibit 5's comparison of sludge incineration with other fuels may no longer be an accurate basis for regulatory decisions. Additional details may be found in a report titled "Improvements in Biosolids Quality Due to EPA's Pretreatment and Biosolids Programs" a copy of which is attached. Also, EPA just completed and published the results from its Targeted National Sewage Sludge Survey, which contains updated information on all of the 40 CFR Part 503 contaminants for nearly 100 POTWs nationwide.

III. Comments on the Criteria for Determining Whether a Secondary Material is a Solid Waste

NACWA commends EPA for recognizing that some secondary materials that were previously regarded as wastes are now emerging as viable fuels due to technological and economic changes. The regulation of these alternative materials is of interest to all facilities, including POTWs, as the country begins to evaluate future fuel options. NACWA supports EPA's determination that materials to be used as fuels and ingredients should not be considered solid wastes. It is appropriate to exclude these materials, including dewatered and/or pelletized sewage sludge, from the definition of solid waste to encourage their beneficial use. NACWA encourages EPA to take a broad and flexible view of what constitutes a fuel or ingredient to maximize the environmental benefits associated with energy recovery and the beneficial reuse of secondary materials as ingredients.

A. EPA Should Not use "Containment" as an Exclusive Criterion for Defining a Valuable "Commodity" that is not a Solid Waste.

EPA's criteria for determining whether something is a "commodity" as opposed to a waste should be broad and flexible. Although "containment" may offer one way to indicate that a material has value and will be used in the future, many valuable commodities do not need to be contained to serve their beneficial use. Non-hazardous secondary materials should be considered valuable and, therefore, not a solid waste, if they have demonstrated value as an ingredient or fuel. Instead of focusing on containment, EPA should focus on whether the material has value for future use as an ingredient or fuel.

B. EPA Should Employ a Qualitative System for Determining Legitimate Heating Values

NACWA supports EPA's determination that heating value should be assessed qualitatively. Heating values of the same secondary material may vary widely depending on water content and other factors that can change as the material is processed. It would be unfortunate for this regulation to drive unnecessary processing or dewatering of secondary material just to meet a regulatory definition. As an example, the Materials Characterization Paper for Wastewater Treatment Sludge indicates broad heat value variation from 4,000 Btu to 16,700 Btu per pound of dry solids. While Btu heating value could be one way to demonstrate that a secondary material is a commodity and not a waste, it should not be a necessary criterion for a secondary material to qualify as a fuel. Furthermore, newer technologies (such as fluidized bed incinerators) have the ability to combust efficiently materials with lower heating values. To accommodate this trend in technology, and the potential for future developments that enable energy recovery from materials with even lower heat values, EPA should not set a bright line Btu value that distinguishes a fuel from a waste.

NACWA Comments on Advanced Notice of Proposed Rulemaking, 74 Fed.

Reg. 41

Attention Docket ID No. EPA-HQ-RCRA-2008-0329

February 2, 2009

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Conclusion

In issuing the Proposed and Final Rules, NACWA requests that EPA expressly include the following finding:

The Domestic Sewage Exclusion under RCRA expressly excludes “solid and dissolved materials in domestic sewage” from the definition of solid waste. This Exclusion includes the sewage sludge generated by Publicly Owned Treatment Works treating domestic sewage that may include non-domestic indirect discharges into the domestic sewer system. Sewage sludge from Publicly Owned Treatment Works treating domestic sewage are, therefore, excluded from the regulatory definition of “solid waste.”

NACWA also asks EPA to set flexible criteria for defining fuels and ingredients to maximize the environmental benefit derived from energy recovery and beneficial use of secondary materials.

NACWA thanks EPA for the opportunity to submit comments. If you have any questions or require additional information concerning NACWA’s position on this issue, please do not hesitate to contact me.

Respectfully submitted,



Chris Hornback
Senior Director, Regulatory Affairs

Attachment

Cc: Robert Dominak
Douglas A. McWilliams

Improvements in Biosolids Quality Due to EPA's Pretreatment and Biosolids Programs

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Abstract

Publicly owned treatment works (POTWs) across the United States have realized a major reduction in the heavy metals in their influent and effluent, along with a substantial improvement in the quality of their biosolids, due to the development and promulgation, by the United States Environmental Protection Agency (EPA), of the following regulations:

1. General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403), and
2. Standards for the Use or Disposal of Biosolids (40 CFR Part 503).

While professionals in our industry are well versed in the positive impact that these regulations have had on human health and the environment, efforts to document and report these impacts to the general public have been minimal.

Keywords

Biosolids, 40 CFR Part 503, Pretreatment, 40 CFR Part 403, Heavy Metals

Introduction

The Northeast Ohio Regional Sewer District (District) provides wastewater conveyance and treatment services for 1.1 million residents and businesses in the Greater Cleveland area. Since its creation in 1972, the District has spent over \$1.8 billion dollars to expand and upgrade its infrastructure.

The District's monitoring of industrial dischargers and enforcement of pretreatment regulations has effected a major reduction in heavy metals and other pollutants entering its three treatment facilities. These efforts, which have substantially reduced influent, effluent and biosolids metal concentrations, have been of value to the District's mission to protect public health and the environment.

National Pretreatment Standards

Pursuant to the Clean Water Act of 1977 and regulations enacted thereafter (specifically, 40 CFR Part 403), EPA established various responsibilities of Federal, State, and local governments, industry and the public to implement National Pretreatment Standards. Part 403 was enacted in January 1981, with the District obtaining approval for its pretreatment program on September 9, 1985.

One of the central objectives of the District's pretreatment program was the prevention of the introduction of pollutants into its three wastewater treatment plants (WWTPs) that interfere with the operation of its plants and the use or disposal of each plant's biosolids (i.e., sewage sludge).

History of the District's Pretreatment Programs

Several years prior to the promulgation of the National Pretreatment Standards, the District formed an Industrial Waste Section that ensured that the discharge of fats, oils, grease, acids and diesel fuels into Greater Cleveland's sewer system complied with the District's local limits.

Cyanide is a toxic pollutant that for many years was discharged without pretreatment. If concentrations of Cyanide reached certain levels in the POTW influent, it could cause inhibition of the treatment process. Elevated influent concentration may also pass through the treatment process and into the plant effluent. If toxic levels of Cyanide in the effluent were passed into the receiving stream, it would likely impact the viability of the organisms in the receiving water. Industrial Waste personnel reported that metal concentrations in the plants influent and biosolids substantially increased in the late 1970s due to the Cyanide destruction requirements. Up to that point in time, Cyanide used in industrial processes actually kept the heavy metals in solution. By requiring the industrial users to destroy Cyanide it allowed the metals to be suspended from solution and precipitated more readily at the POTW, increasing the metal concentrations in biosolids and reducing it in the final effluent.

The District pretreatment program was approved by USEPA in September 1985. The actual implementation of the program began in January 1984 under the authority of the District's Code of Regulations, Pretreatment Regulations. At that time, industrial dischargers falling under the existing or new categorical standards were inspected, sampled, and classified according to their applicable categories, and thereupon determined to be in or out of compliance.

The District then presented all industrial dischargers within its service area “administrative orders” to install the necessary pretreatment systems. The District typically monitors its industrial dischargers annually. Criteria for increased monitoring included past performance, citizen complaints, compliance status, potential for toxic discharges and the existence of any District enforcement judgments.

In addition to annual monitoring by District personnel, industrial dischargers were required to submit bi-annual self-monitoring reports, along with monthly samples of their waste.

Tracking-Down Illegal Dischargers

The District’s pretreatment strategy between 1975 and 1982 was (i) to require good housekeeping, conservation, and source control for heavy metals and (ii) require pretreatment for acids and cyanides. A major effort was made to inform local industrial dischargers of upcoming federal pretreatment regulations. The Greater Cleveland area had a substantial number of electroplaters and other industries traditionally having high concentrations of metals in their discharges. These firms were notified that upcoming federal pretreatment regulations would be aggressively enforced by District personnel. As a result, most industrial dischargers were prepared when the order to pretreat was given. Affected industries, under pressure from District, changed their processes from a wasteful high-water, non-conservative operations to processes using counter-current rinses, source control, and recycle techniques. The decrease in effluent metal concentrations after 1984 is due primarily to the enforcement of the federal pretreatment standards.

Metal Influent Reductions - Case Studies

To assess the impact of the District’s pretreatment program, the concentration trends for the certain metals were analyzed from 1980 to 2004. Only seven metals (cadmium, chromium, copper, lead, nickel, zinc and mercury) were consistently regulated under federal categorical discharge standards and local discharge limits, to have complete data. District influent data for mercury were available, however detection limits early in the pretreatment program were not as sensitive as they are today making it difficult to assess the effectiveness of the pretreatment program.

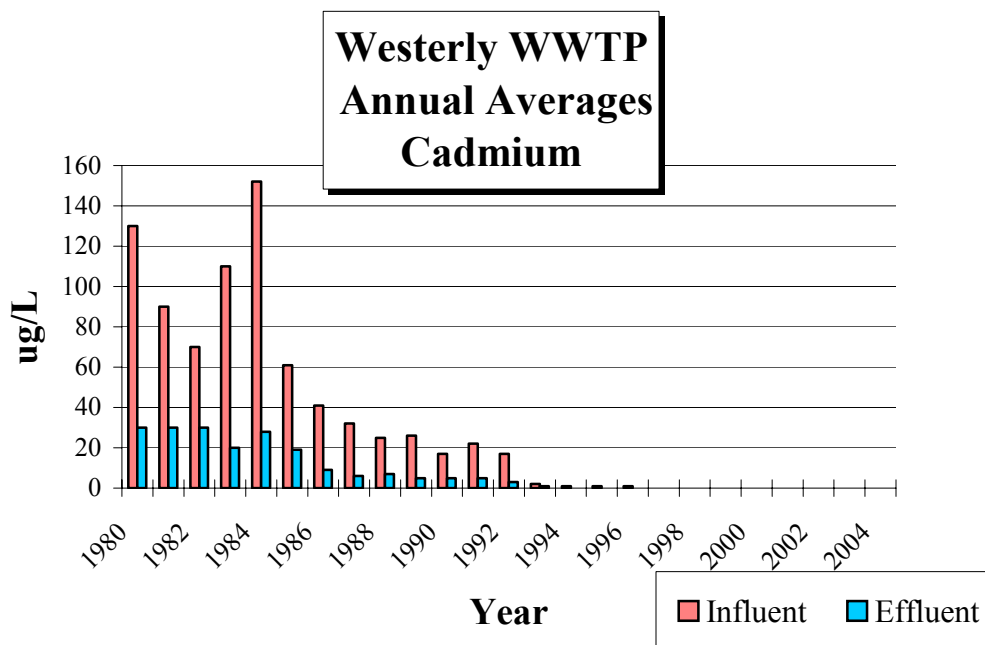
Cadmium

In 1981, the District implemented pretreatment requirements for the discharge of cadmium. This action resulted in a significant reduction in cadmium in the influent loadings at the District’s three WWTPs. The cadmium concentrations continued to decrease after the approval of the District’s federal pretreatment program. Many industries were willing to work at reducing their metal discharges in order to avoid administrative orders and litigation.

With the effectiveness of the District's pretreatment program, the Industrial Surveillance Section was able to identify industrial dischargers that were not in compliance. Many of these companies either had systematic problems with their pretreatment equipment or needed to implement a system.

In 1984, the District met with representatives of a plating operation located within the Westerly WWTP's service area after an analysis revealed that the company was out of compliance with Federal discharge limitations for cadmium. The outcome of the meeting resulted in the cadmium plating operation being eliminated. The company eventually installed a heavy metal removal system to prevent federal and local violations for other heavy metals. Figure 1 shows the 60% cadmium reduction between 1984 and 1985 in Westerly's influent, due to the elimination of one illegal discharger. A continued decline of cadmium concentrations was a result of the District's pretreatment program.

Figure 1. Westerly WWTP Influent and Effluent Cadmium Concentrations



Lead

In 1973, EPA initiated a "phase down" program designed to bring the levels of lead down in gasoline to 0.5 grams per gallon by 1980 in large refineries and by 1982 in small refineries. The standard allowed refineries to average their total (leaded and unleaded) output to reach the 0.5 standard.

In 1982, EPA changed the standard to 1.10 grams per leaded gallon but eliminated the provision that allowed averaging between unleaded and leaded gasoline. The new standard was projected to bring about a 34 percent reduction in the amount of lead being used by the refining industry as the demand for leaded gasoline declined.

Standards to phase out lead in gasoline came into effect in January 1986 and limit the lead content of gasoline to 0.10 grams per gallon. In January 1996, the Clean Air Act banned the sale of leaded fuel.

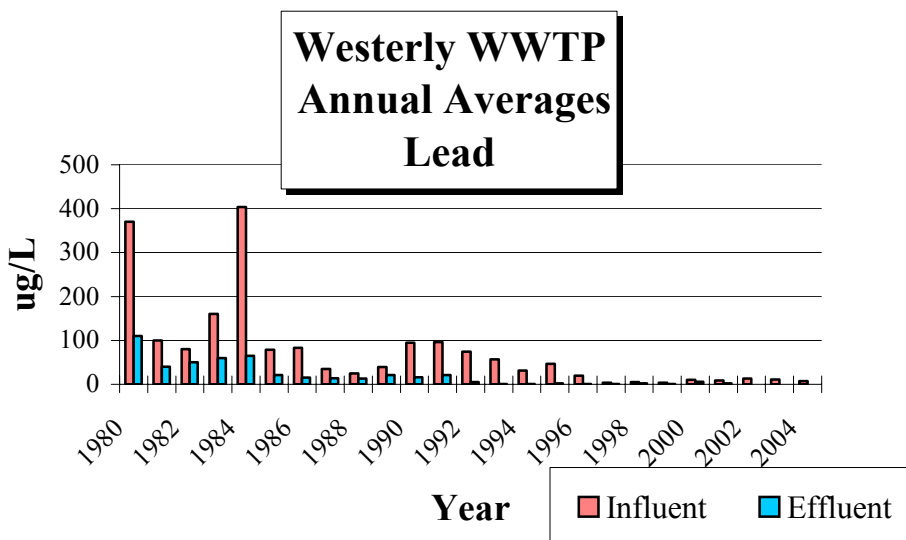
These rulings had a remarkable impact on lead concentrations coming into the District's three treatment plants. The monitoring and enforcement of the pretreatment program also helped reduce discharges.

In 1984, a plating firm located within the Westerly WWTP's service area was found to be discharging extremely high levels of lead. An inspection by District personnel revealed that the high lead concentrations were attributed to lead anodes and lead lined storage tanks. After the plating firm instituted a program to contain and haul the lead discharged to an approved waste treatment facility, Westerly's influent lead concentrations dropped by 77%.

Throughout the 1980's and early 1990's, lead was a major concern coming into the Westerly plant. The major contributor of lead was a smelting facility located along the west bank of the Cuyahoga River. Smelting is the process of reducing reclaimed lead compounds to elemental lead and lead alloys. The company would crack large batteries by lifting them into the air and dropping them onto the ground causing the battery to crack. Battery acid would spill onto the ground containing high levels of lead. Although the company was not directly discharging to the sewer system, during wet weather events, runoff from the site would enter into the combined sewer system that was tributary to Westerly. In 1993, the State of Ohio shut the facility down and in 1999, U.S. EPA began a final clean up.

Figure 2 shows lead concentrations coming into the Westerly plant from 1980 – 2004. years. The spike seen in 1984 was due to a single illegal discharger. Concentrations in the mid-1990's dropped due to the lead smelting facility ending operation.

Figure 2. Lead Influent and Effluent Concentrations at Westerly WWTP



Influent Loadings Reduction

Since the inception of the pre-treatment program at the District, metals have had a continued downward trend in treatment plant influents and effluents. From 1980- 2004, the District has seen a substantial reduction in metals entering its three-wastewater treatment plants. The following are a few examples of overall metal reductions in the plants' influent and effluent. Figures 3 through 5 show the reduction of heavy metal concentrations entering the three treatment plants in 2004 compared to 1980. These figures demonstrate the success of the District's pretreatment program. Table 1 shows the average influent and effluent reductions of the six metals evaluated in the paper over the last 24 years coming into the District's three treatment plants.

Figure 3. Easterly WWTP Heavy Metal Influent Concentrations and Percent Reduction

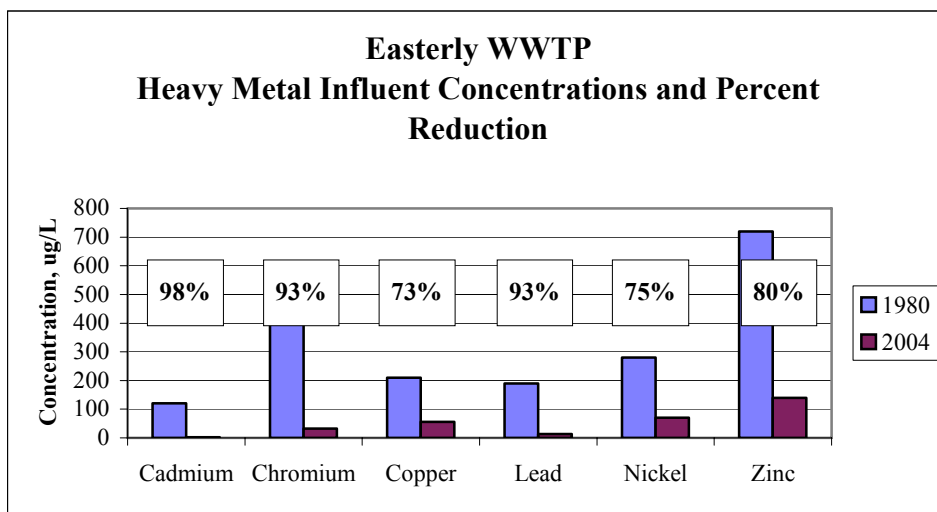


Figure 4. Southerly WWTC Heavy Metal Influent Concentrations and Percent Reduction

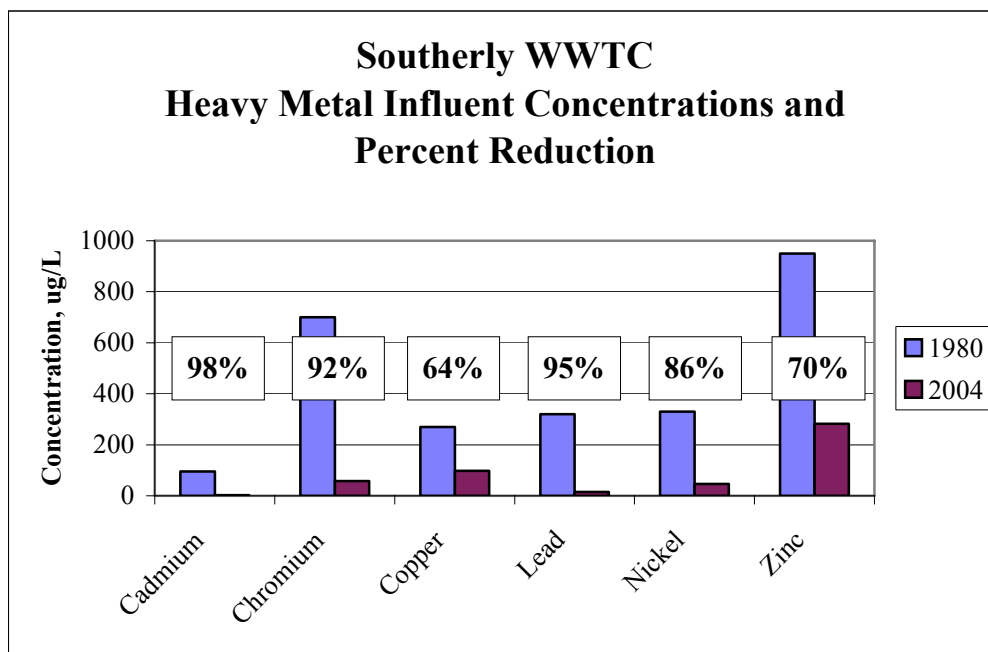


Figure 5. Westerly WWTP Heavy Metal Influent Concentrations and Percent Reduction

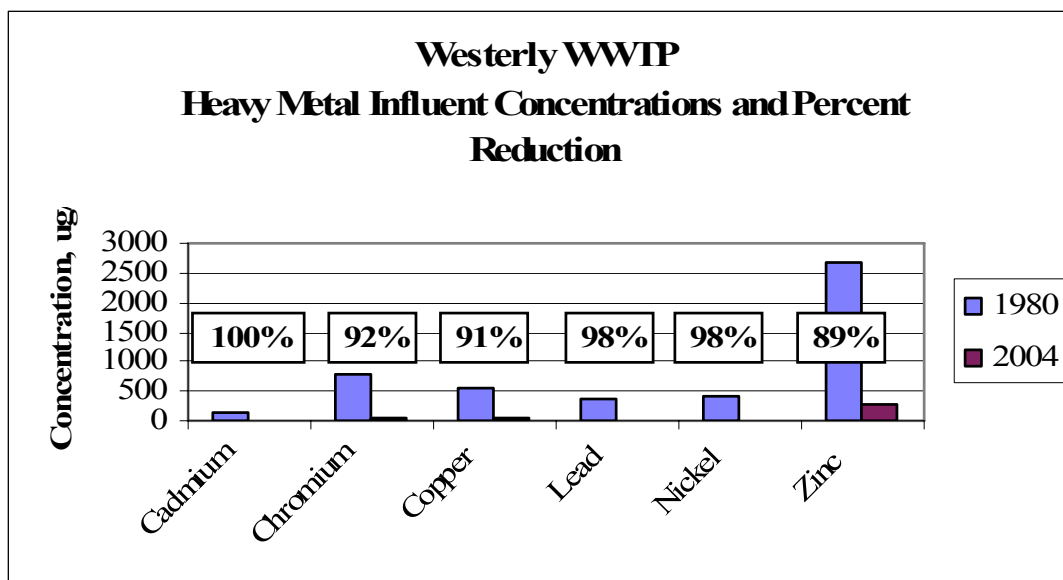


Table 1: Average Reductions in Selected Metals from 1980 – 2004 for NEORSD's Three WWTPs:

Metal	% Reduction in Influent	% Reduction in Effluent
Cadmium	99	99
Chromium	90	97
Copper	62	90
Lead	95	100
Nickel	89	90
Zinc	87	90

Industrial Changes in Greater Cleveland

A common inquiry regarding the reduction trends in heavy metals is whether or not the decrease in concentrations can also be attributed to the decline of heavy industry in Northeast Ohio. The following are the numbers of electroplaters monitored by the District for specified years:

- 1985-130
- 1990-143
- 1995-133
- 2000-121
- 2005-111

Today there are fewer electroplating companies compared to when the pretreatment program was implemented. However, the data listed above show that between 1985 and 1990 there was an increase in electroplaters. Heavy metal concentrations at the treatment plants declined during this timeframe. Appendix A of this paper contains figures showing the decline of heavy metal influent and effluent concentrations.

National Biosolids Regulation

In the early 1990's, the District started to update its Code of Regulations to integrate potential changes in federal and state regulations related to pretreatment. At this time, the District also began to evaluate how to reduce metal concentrations in its biosolids pending future biosolids regulations. As required by the Clean Water Act Amendments of 1987, USEPA developed a new regulation, 40 CFR Part 503, to protect human health and the environment from any reasonable anticipated adverse effects of certain pollutants that might be present in biosolids. Enacted in February 1993, Part 503 forced POTWs to carefully examine the metal concentrations in their biosolids and biosolids incinerator exit gases, and to find ways to reduce the metal concentrations and emissions. As a result of the Part 503 regulations, the District bolstered its pretreatment program to further decrease metal concentrations.

The District uses incineration to manage its biosolids. Solids from the Easterly WWTP are pumped through a 13-mile long force main to the Southerly WWTC for processing and disposal in Southerly's four multiple hearth incinerators (MHIs). Westerly's biosolids are burned in two MHIs located at Westerly.

Case Study - Cadmium

Prior to the promulgation of the Part 503 Regulation, the District undertook a program to ensure compliance with the proposed incineration related metal limits. One concern was with higher than normal cadmium concentrations being found in Southerly's biosolids. As previously mentioned, Southerly receives approximately 50% of its solids from the Easterly WWTP.

An in-house study was commissioned in 1993 to investigate higher than expected cadmium concentrations at the Easterly plant during the early 1990's. This was accomplished by sampling the tributary interceptors to the treatment plant. As a result of the pretreatment standards, industrial discharges were typically so void of heavy metals that the interceptor carrying the excessive loading was identified readily.

In 1994, a single plating firm in Easterly's service area was found to be bypassing pretreatment by discharging its waste during wet-weather events directly to its sewer. The company was issued a Cease and Desist Order and recommended for Show Cause Hearing. The company was fined over \$20,000 and the owner was ordered to upgrade its pretreatment system to meet all applicable federal and local discharge limits prior to being allowed to discharge into the sanitary sewer system again.

In October 1998, a review of the monthly operating report by District personnel noted a marked increase of cadmium concentration in the biosolids at the Southerly WWTC. Samplers were deployed downstream of known cadmium sources. Within the laboratory turn around time, the source was identified and a Cease and Desist Order issued to the industrial user. The plating company was cooperative in rehabilitation of its pretreatment system and cessation of discharge during the period. A Show Cause Hearing was recommended for discharge violations and a settlement was reached.

Figure 6 demonstrates the effectiveness of the District pretreatment program. A decrease in annual cadmium concentrations at the Southerly WWTC can be seen after the pretreatment programs was approved in 1985 and again after 1993 when the Part 503 programs were announced. Monthly peaks shown on the figure also show when companies were illegally discharging.

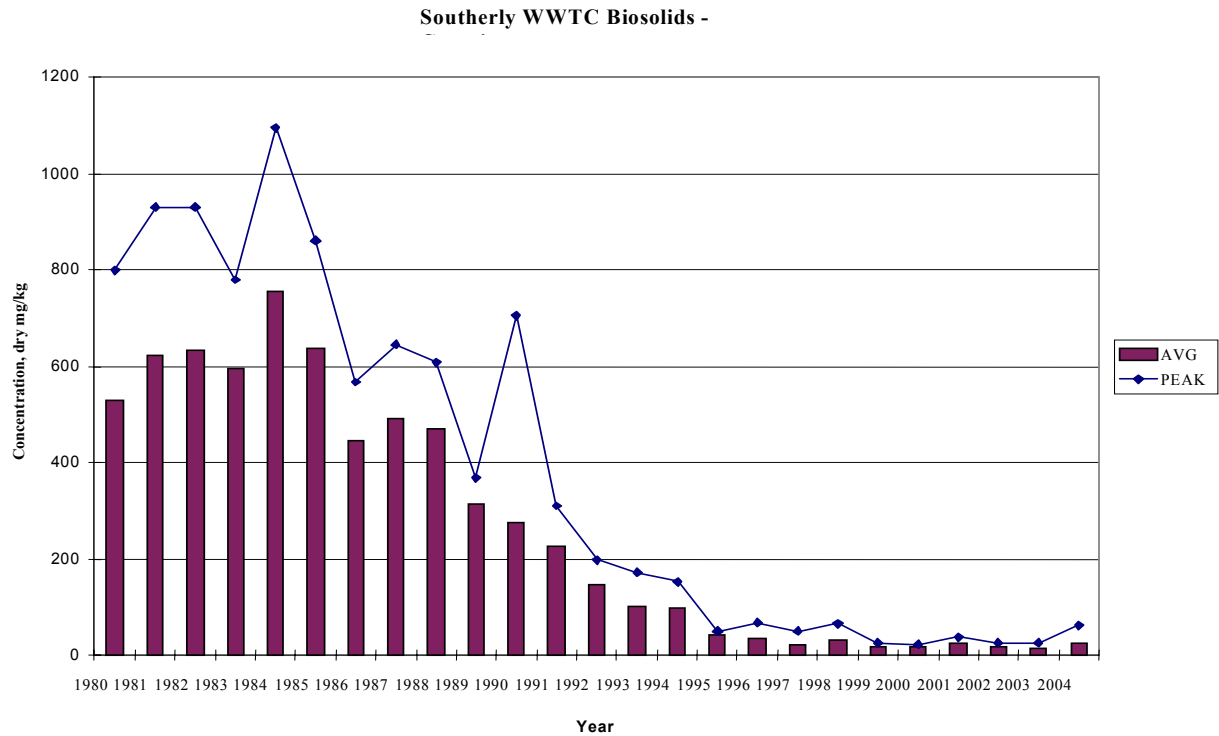


Figure 6. Cadmium Concentrations (dry weight basis) in Southerly Biosolids

In the late 1990s, given potentially more stringent regulatory requirements and rising operational and maintenance costs, the District decided to embark on a thorough investigation of potential residuals management options, through a residuals management study. One of the first actions taken was to determine how the quality of Southerly and Westerly's biosolids compared to the land application requirements contained in the Part 503 Regulation. Columns 1 and 2 contain the Part 503 Pollutant concentration limits for biosolids that are land applied, while Columns 3 and 4 show Southerly and Westerly actual biosolids concentrations. Table 2 clearly demonstrates that Southerly and Westerly's biosolids metal concentrations are substantially below the Part 503 land application metal limits.

Table 2: Part 503 Land Application Limits vs. Actual 2004 Concentrations

Pollutant	<u>Column 1</u> Ceiling Concentrations (mg/dry kg)	<u>Column 2</u> Pollutant Concentrations (mg/dry kg)	<u>Column 3</u> Southerly WWTP Highest 2004 Monthly Average Concentrations (mg/dry kg)	<u>Column 4</u> Westerly WWTP Highest 2004 60-day Average Concentrations (mg/dry kg)
Arsenic	75	41	10	13
Cadmium	85	39	62	18
Chromium	Deleted in 1995	Deleted in 1995	441	435
Copper	4300	1500	529	489
Lead	840	300	185	227
Mercury	57	17	3	1
Molybdenum	75	Deleted in 1994	20	25
Nickel	420	420	119	72
Selenium	100	100	15	2
Zinc	7500	2800	1486	2123
	All biosolids that are land applied	Bulk and bagged biosolids		

Table 3 shows Southerly and Westerly's site specific Part 503 Limits and the maximum concentrations.

Table 3: Part 503 Site Specific Incineration Limits vs. Actual 2004 Concentrations

Notes:

Pollutant	Southerly WWTP Part 503 Limit (mg/dry kg)	Southerly WWTP Highest 2004 Monthly Avg. Concentration (mg/dry kg)	Westerly WWTP Part 503 Limit (mg/dry kg)	Westerly WWTP Highest 2004 60-day Avg. Concentration (mg/dry kg)
Arsenic	292	10	511	13
Cadmium	272	62	450	18
Chromium	18,071	441	50,473	435
Lead	12,508	185	2,678	227
Nickel	379,429	119	168,995	72

Site specific limits are based on the quantities of biosolids incinerated and air pollution control devices' actual control efficiencies for arsenic, cadmium, chromium, lead and nickel.

Table 3 clearly demonstrates that Southerly and Westerly's biosolids metal concentrations and resulting air emissions are substantially below the Part 503 site specific incineration limits.

From 1980 to 2004, NEORSD has seen a substantial reduction in metals in its biosolids. The following are a few examples of overall metal reductions in the plants' biosolids:

Figure 7. Southerly WWTC Heavy Metal Biosolids Concentrations (dry weight basis) and Percent Reduction

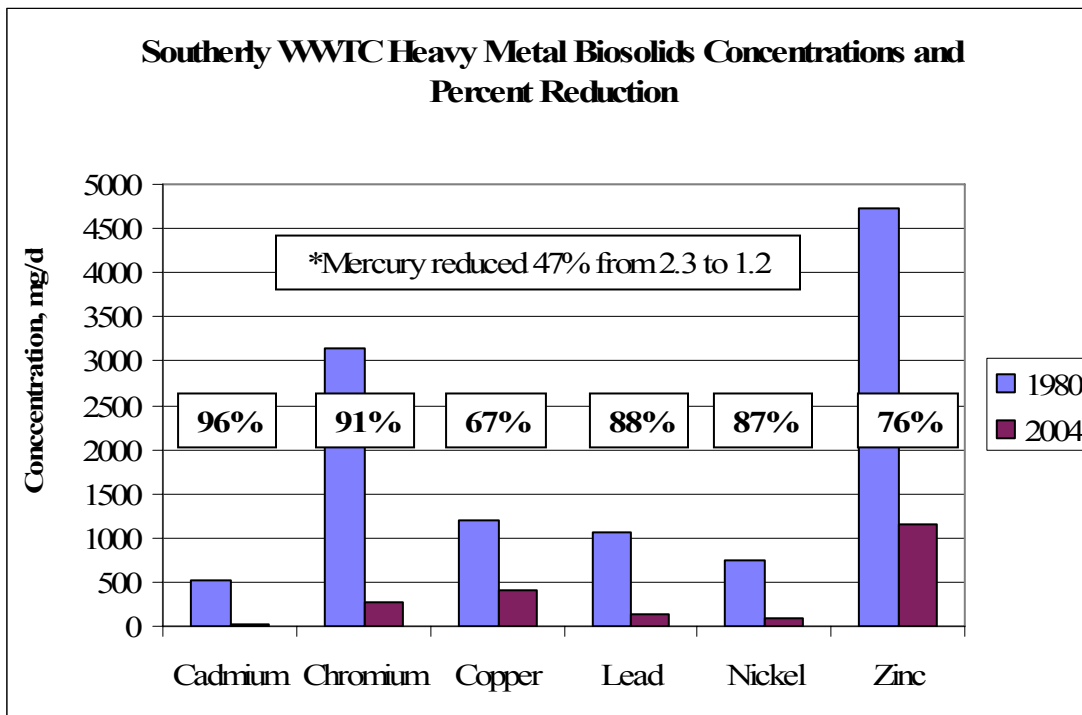


Figure 8. Westerly WWTP Heavy Metal Biosolids Concentrations (dry weight basis) and Percent Reduction

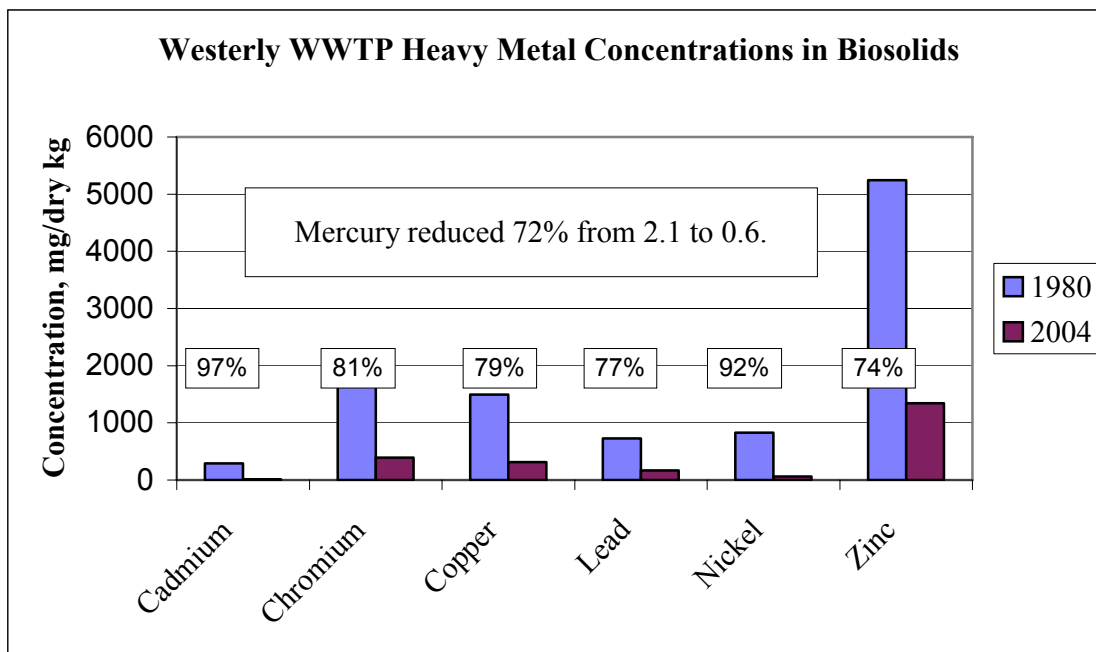


Table 4: Average Reductions in Selected Metals from 1980 – 2004:

Metal	% Reduction in Biosolids
Cadmium	96
Chromium	86
Copper	73
Lead	82
Nickel	96
Zinc	81
Mercury	60

Lessons Learned

Since the Industrial Waste Section was created in 1974, the District's knowledge base has improved markedly. The department, now called Water Quality and Industrial Surveillance (WQIS) has learned the key to a successful program includes employee safety, working with other enforcement agencies and maintaining a thorough database of all industrial users.

The District leverages its strong relationships with other enforcement agencies to track down illegal or accidental discharges. The Superintendent of Environmental Services is on a local pollution control task force. The District also works with local fire departments, hazardous material units and emergency planning committees to keep communication present. The WQIS department only has limited sets of eyes to watch over a large service area, therefore it is essential to work with other agencies and keep them on the lookout for illicit discharges.

The most useful tool in tracking down illegal discharges is a well-maintained and complete database of industrial customers. When the pretreatment program was implemented, the District maintained a list of industries including contact names, water usage and what they discharge (e.g., cadmium) in an Access database. Today, the department is taking advantage of more current technologies to manage pretreatment information and is using these tools to streamline its work.

Using a pretreatment information management system (PIMS), the pretreatment program is able to integrate its laboratory data, currently in a system called LABlynx, with its pretreatment data. This allows WQIS to ensure industries are in compliance from annual monitoring samples, assess surcharge costs for treatment, and provide a warehouse for documentation and inspection reports.

The District has also implemented an industrial user monitoring system, which is similar to a residential home security system. The system notifies the Control Authority of an event at an Industrial User, such as abnormal pH or a discharge valve being opened or closed. The system is currently being upgraded to deliver data about the event rather than simply an occurrence.

The last information management system being employed includes an industrial discharger's digit dialer. This system automatically calls a dedicated phone line at an industrial discharger delivering a message to cease or resume discharging to the sewer system. The system makes the calls based on flow conditions in the combined sewer system or capacity at the tributary POTW. The tool was developed to reduce concentrations of pollutants typically associated with industrial discharges during combined sewer overflows. In cases where an industrial discharger is required to be on both the monitoring system and the dialer, data compiled can be compared to ensure that the industrial user complies with the stop discharge order and closes the discharge valve in a timely manner.

Currently, the District is developing a Geographic Information System (GIS) tool to integrate the sewer system infrastructure with the LABlynx PIMS. The GIS tool will help spatially locate industrial users on a service area map and allow PIMS data to be shared throughout the organization through a user friendly interface. Users can view this data without the risk of making any changes to the data.

Combining these two information systems connects industrial users to the collection system and will allow network tracing upstream or downstream of a particular point. In the future, when a location has been found to have high levels of a particular contaminant, the GIS and PIMS tool will be able to identify users with this contaminant upstream of the location.

Conclusions

Due to the implementation of the Federal Pretreatment Standards along with Federal Standards for the Use or Disposal of Biosolids, the District has seen a substantial reduction in metal concentrations in its influent, effluent, biosolids and biosolids incinerator exhaust gases. Normally spikes in metal concentrations in influent and biosolids can be attributed to a single illegal discharger. Care must be taken to know the locations of your industrial dischargers, their operations, and the metals that they are normally discharging to the sewer system.

The implementation of these programs by the Northeast Ohio Regional Sewer District has resulted in the protection of human health and the environment.

Acknowledgements

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Terry Meister
Timothy Tigue
James Weber
Ray Weeden

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Long-Term Residuals Management Options for the Northeast Ohio Regional Sewer District, Lori Stone and Bob Dominak, Presented at WEFTEC 2003

Monthly NPDES Reports - Easterly, Southerly and Westerly (1980 – 2004)

Annual Part 503 Reports - Southerly and Westerly (1993 – 2004)

Appendices

Appendix A : Easterly WWTP Influent and Effluent Heavy Metal Concentrations

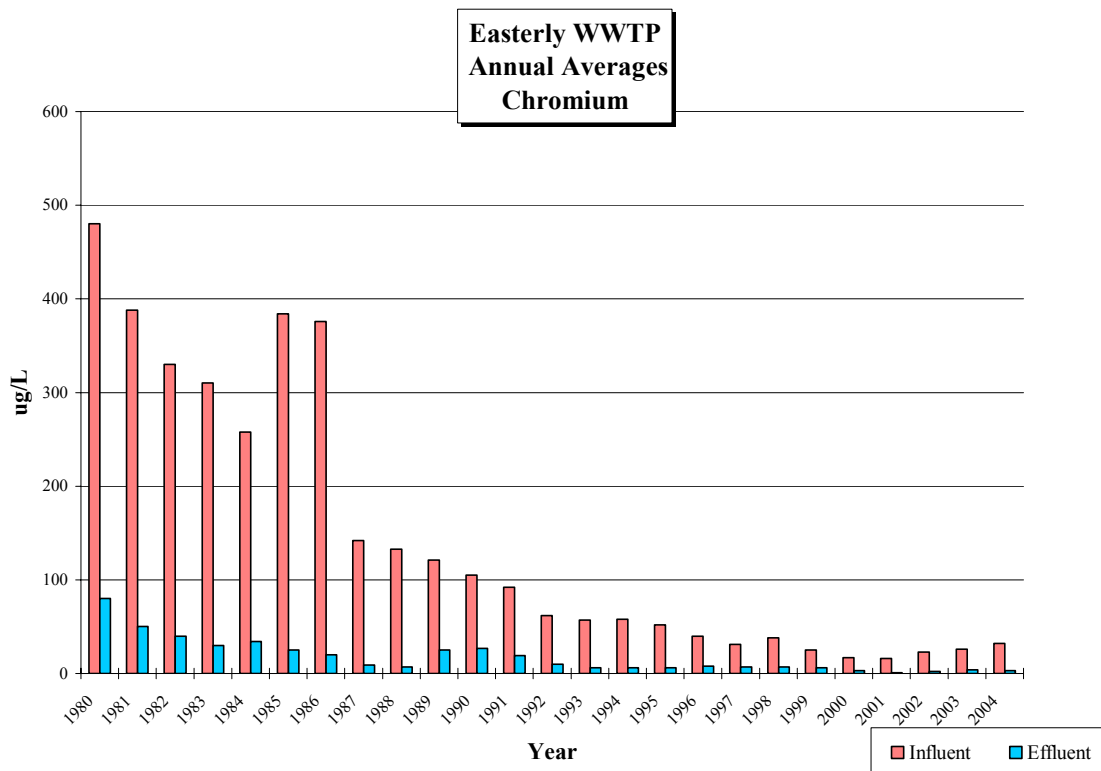
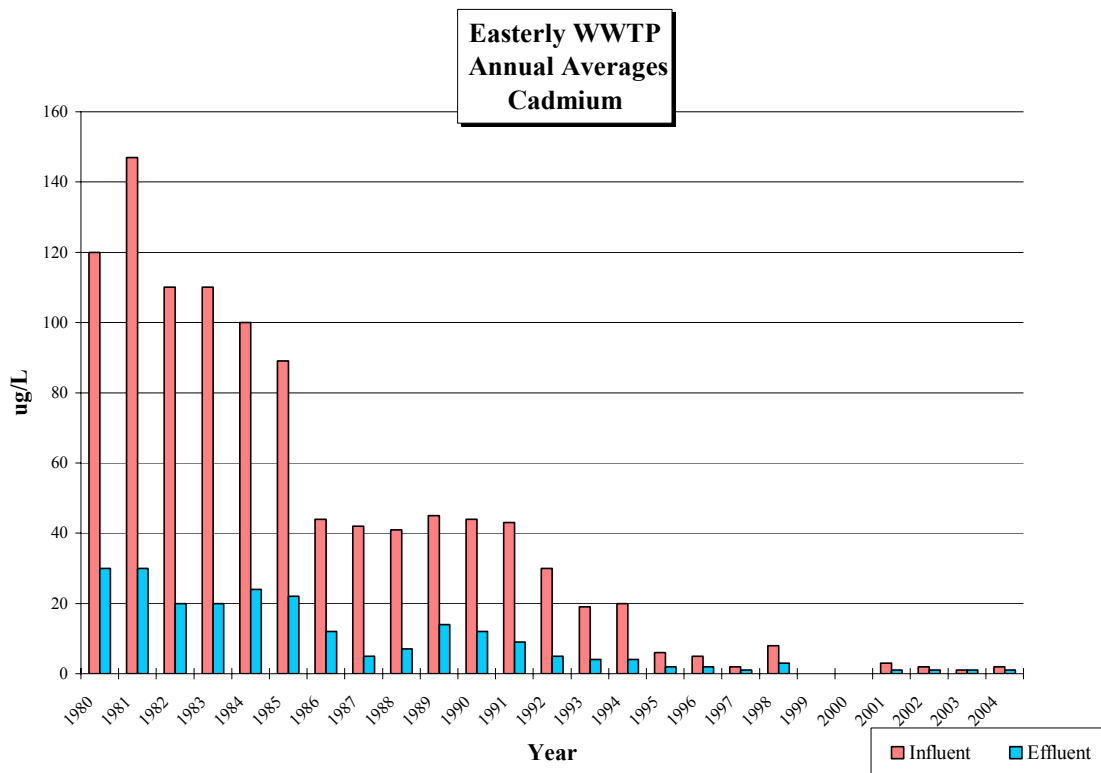
Appendix B: Southerly WWTC Influent and Effluent Annual Average Heavy Metal Concentrations

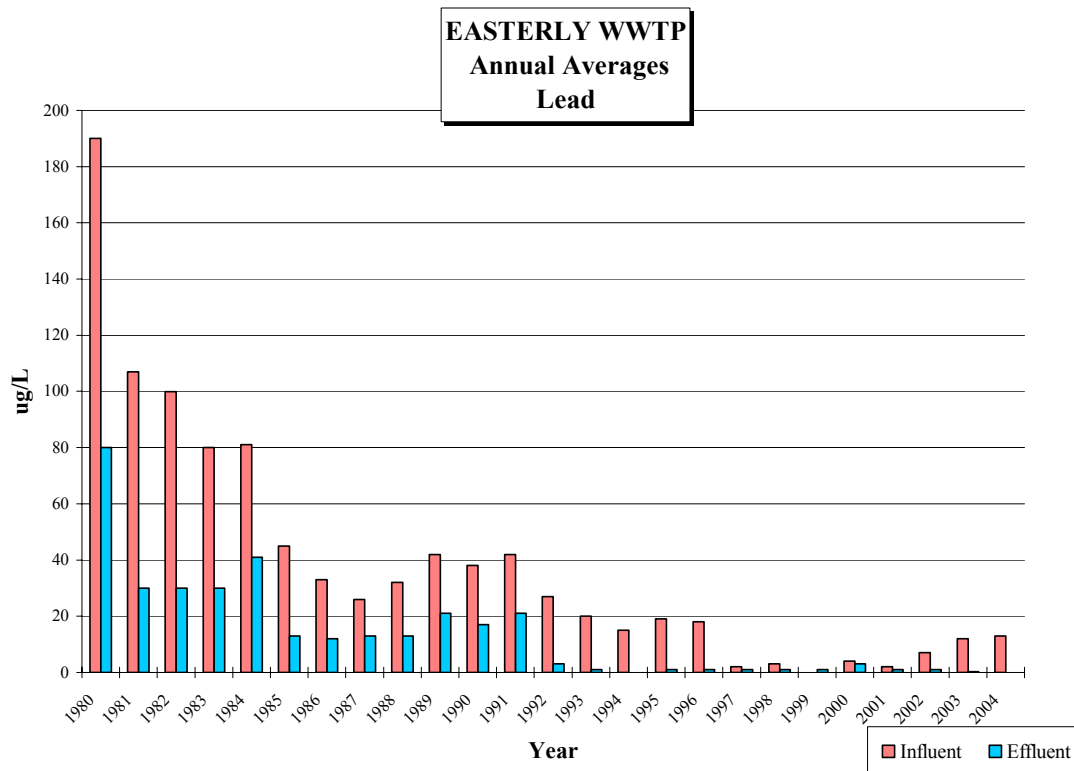
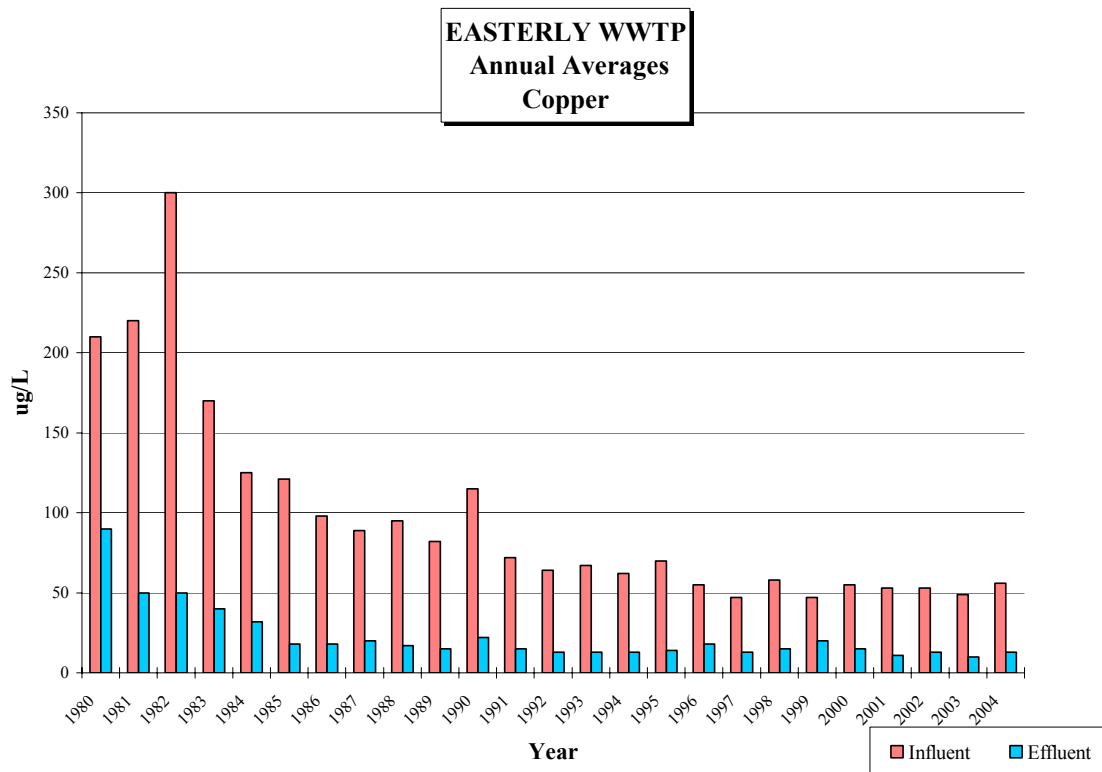
Appendix C: Westerly WWTP Influent and Effluent Annual Average Heavy Metal Concentrations

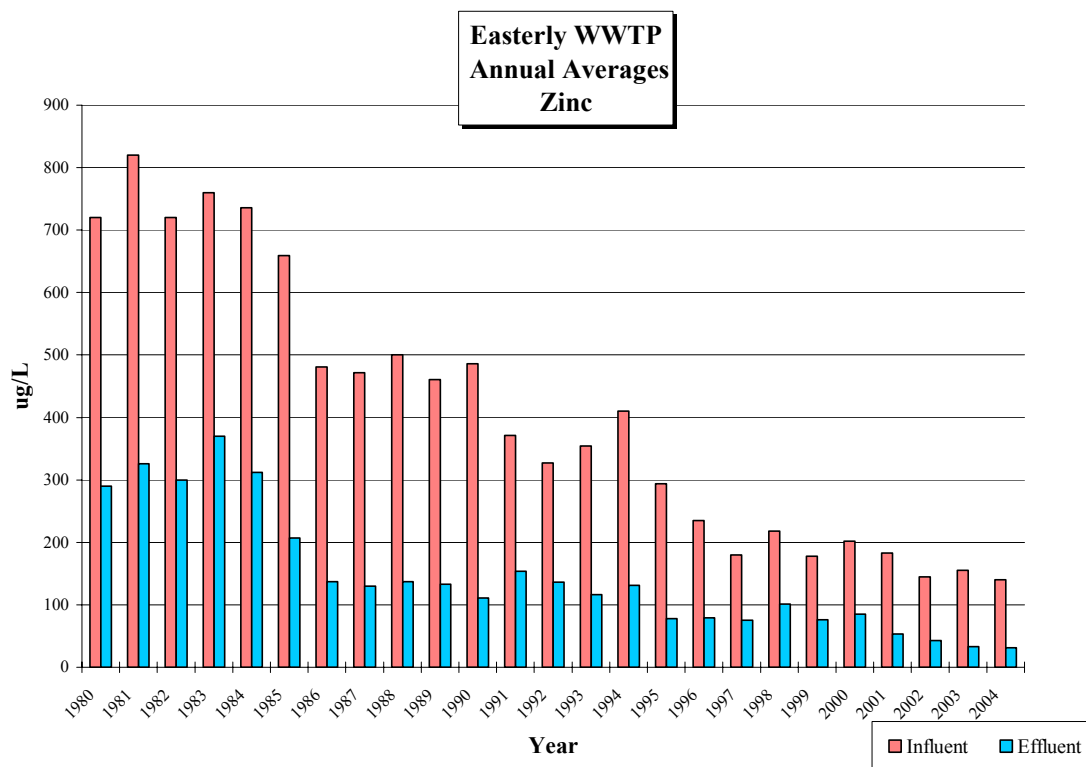
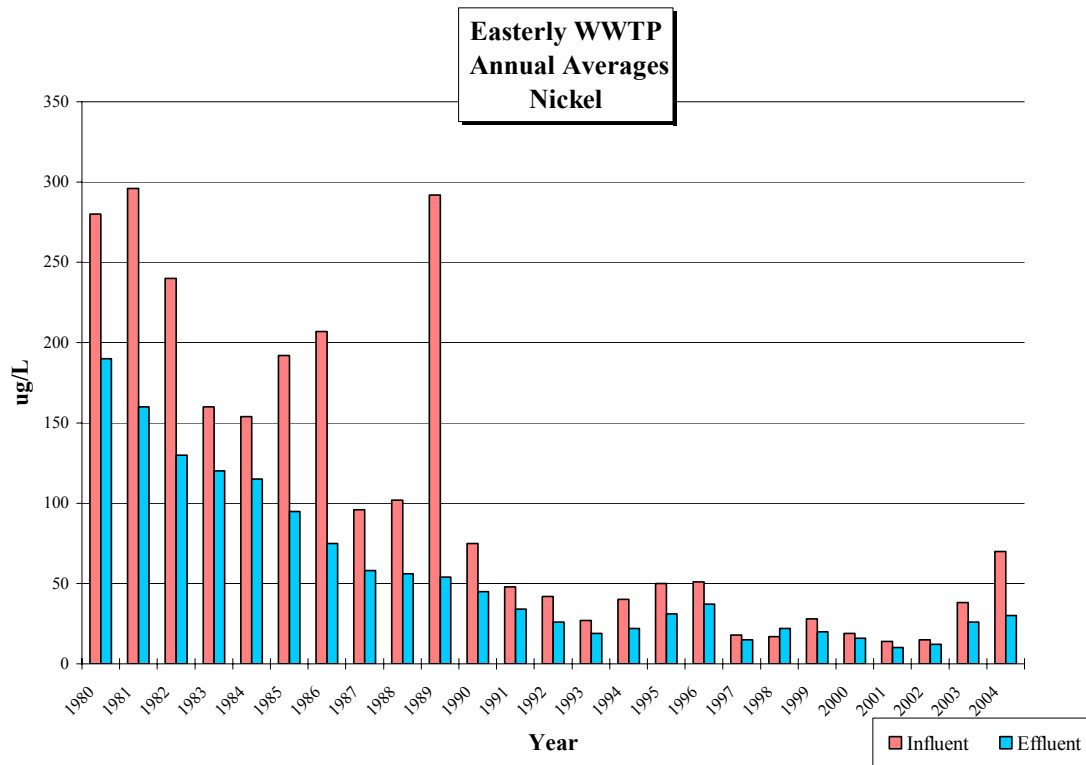
Appendix D: Southerly WWTC Heavy Metal Biosolids Concentrations (dry weight basis) – Annual Average and Monthly Peaks

Appendix E: Westerly WWTP Heavy Metal Biosolids Concentrations (dry weight basis) – Annual Average and Monthly Peaks

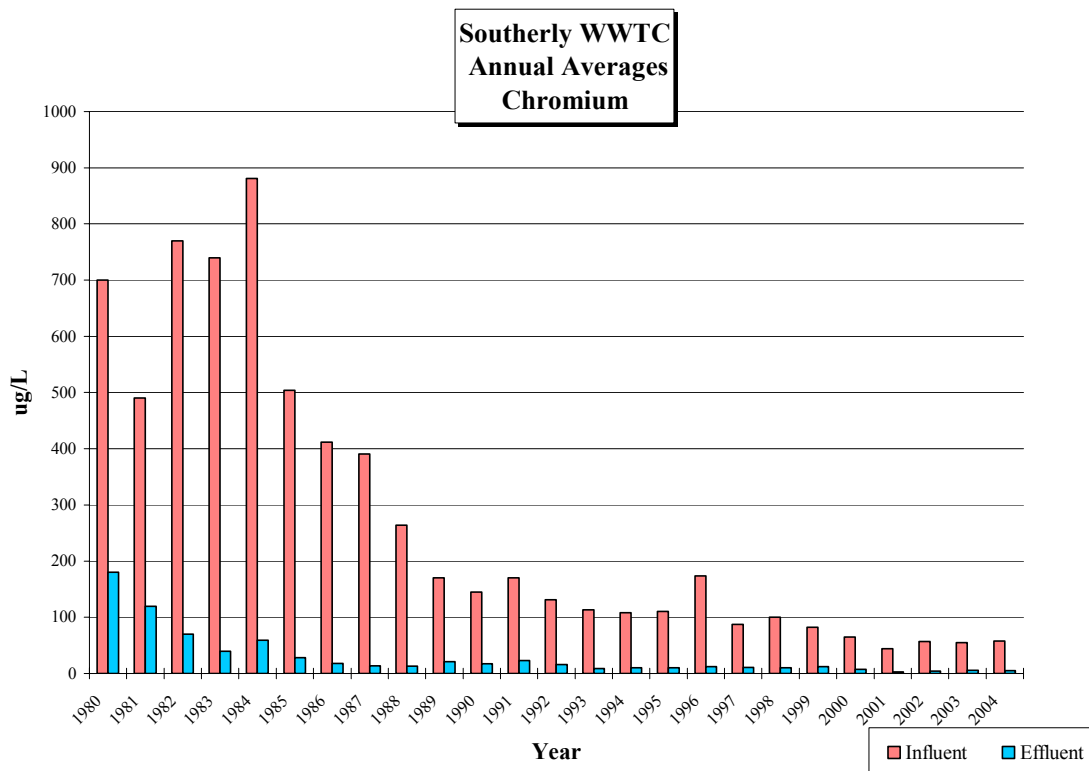
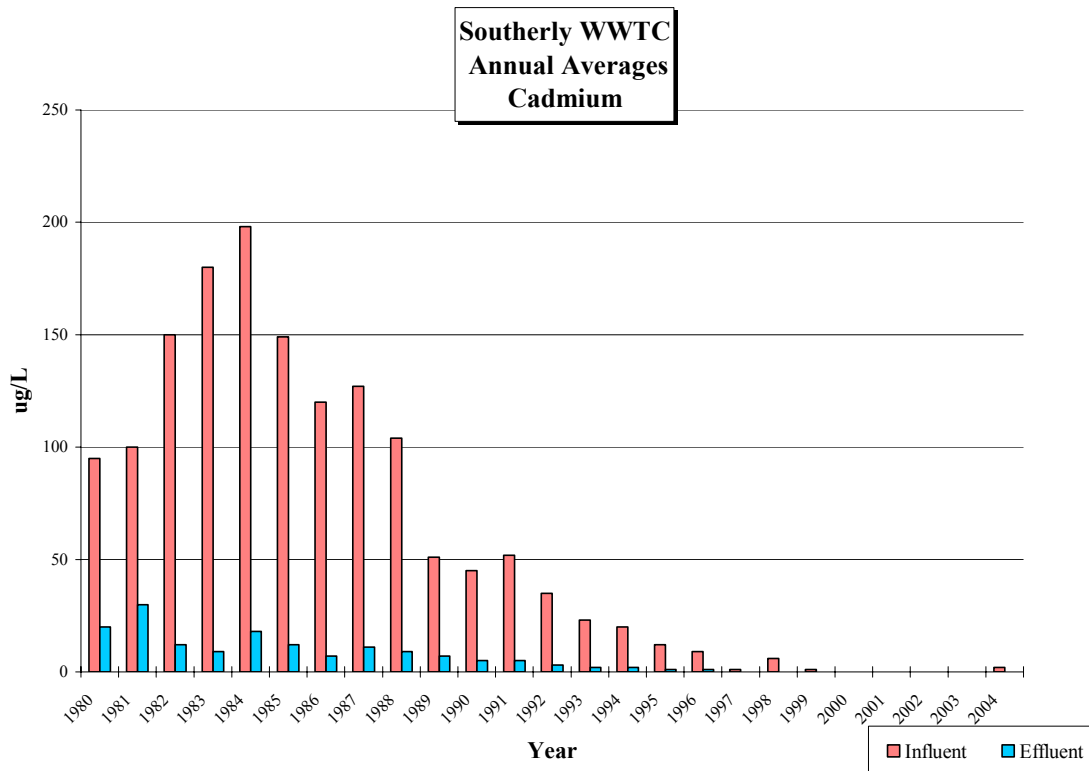
Appendix A: Easterly WWTP Influent and Effluent Annual Average Heavy Metal Concentrations

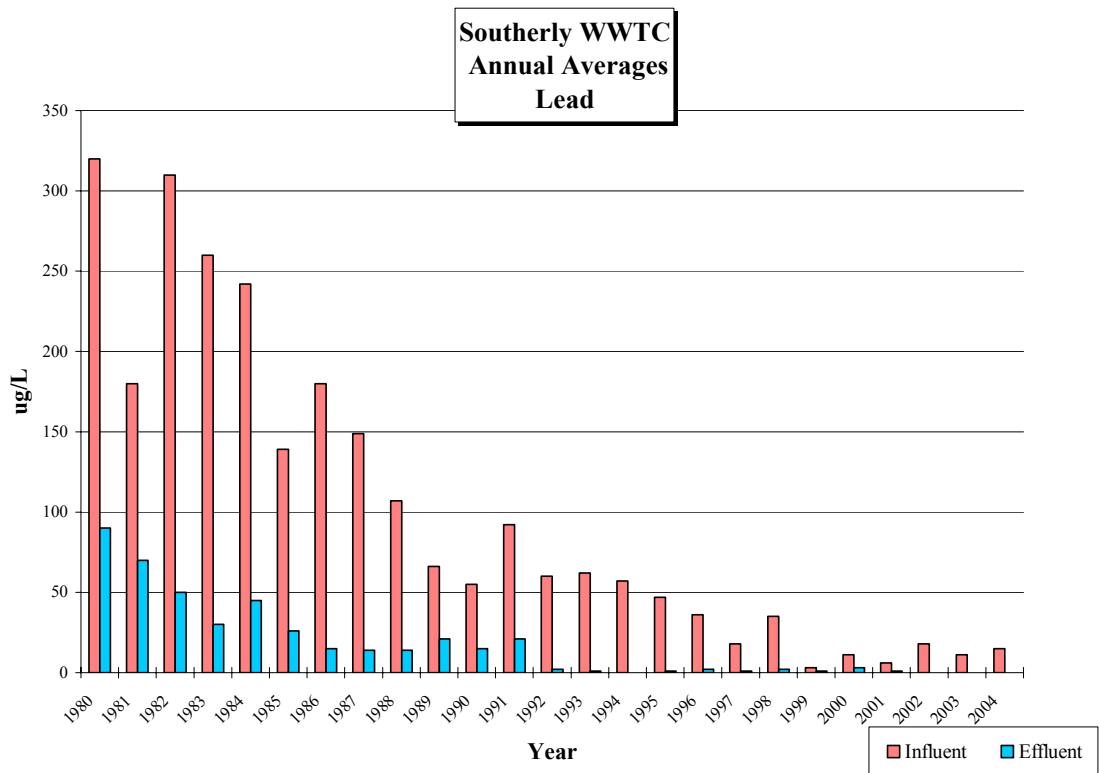
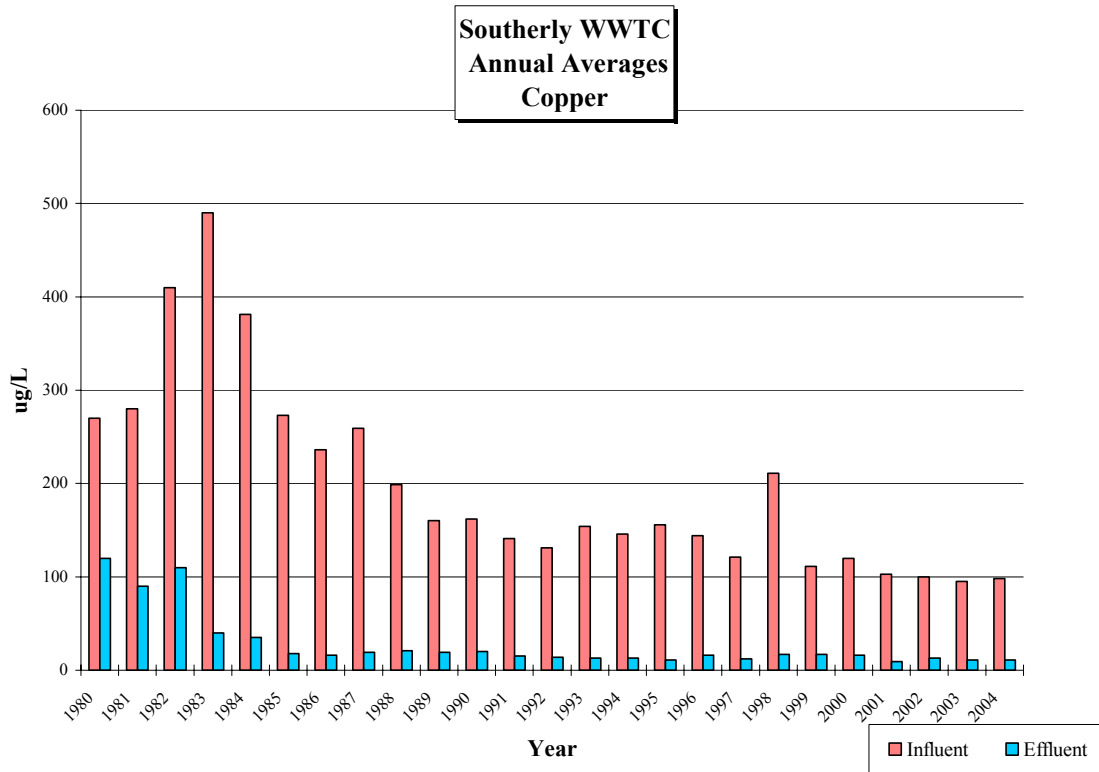


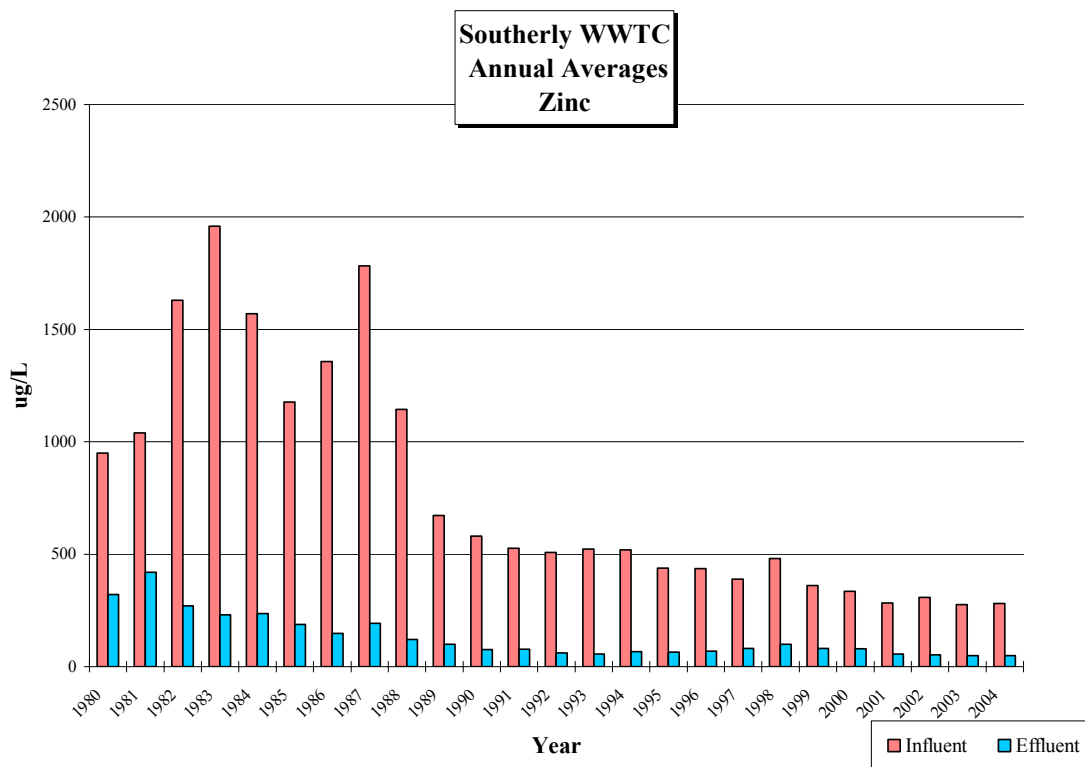
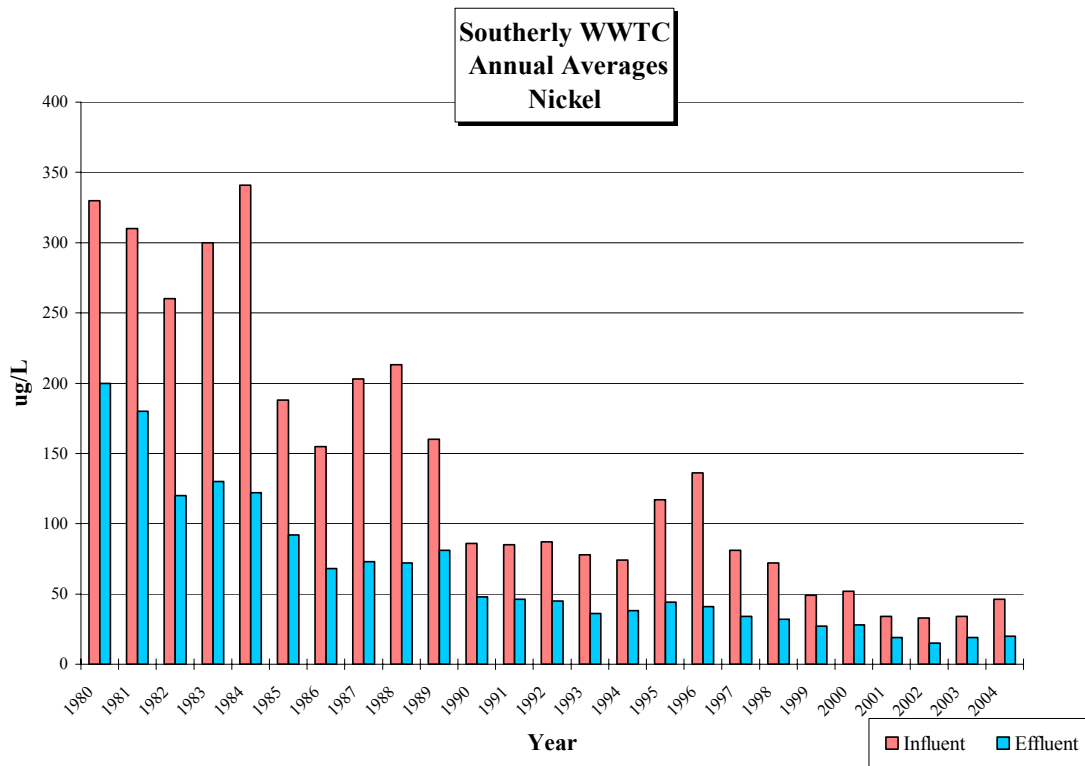




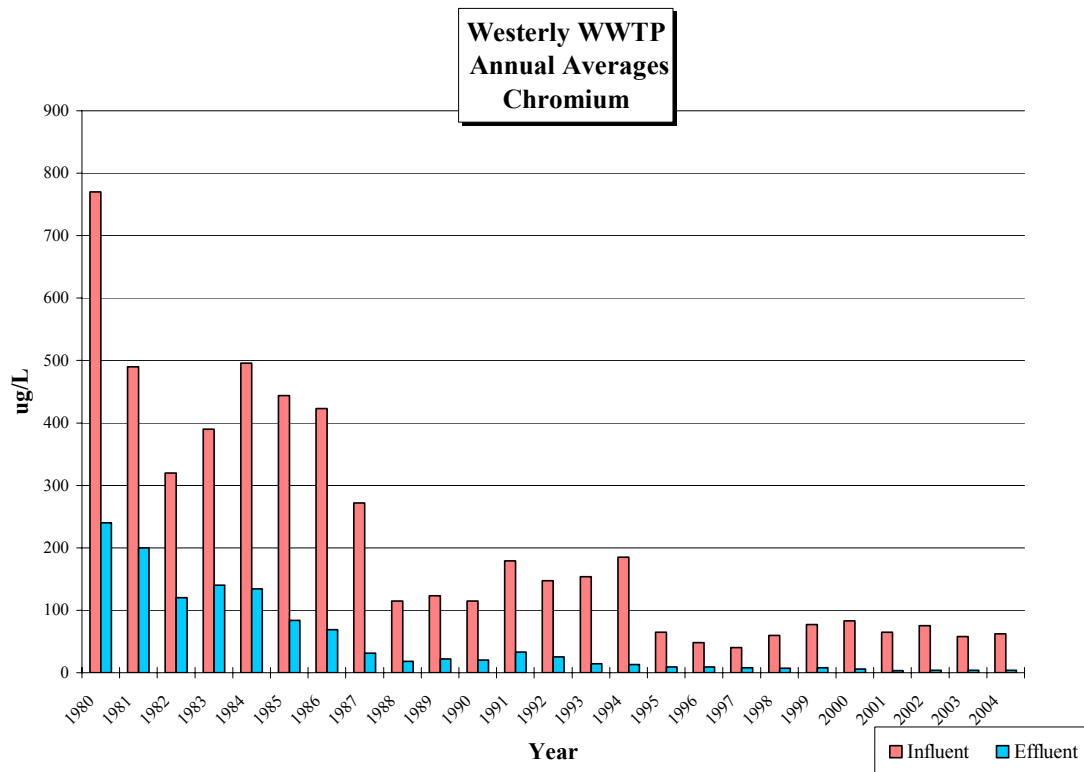
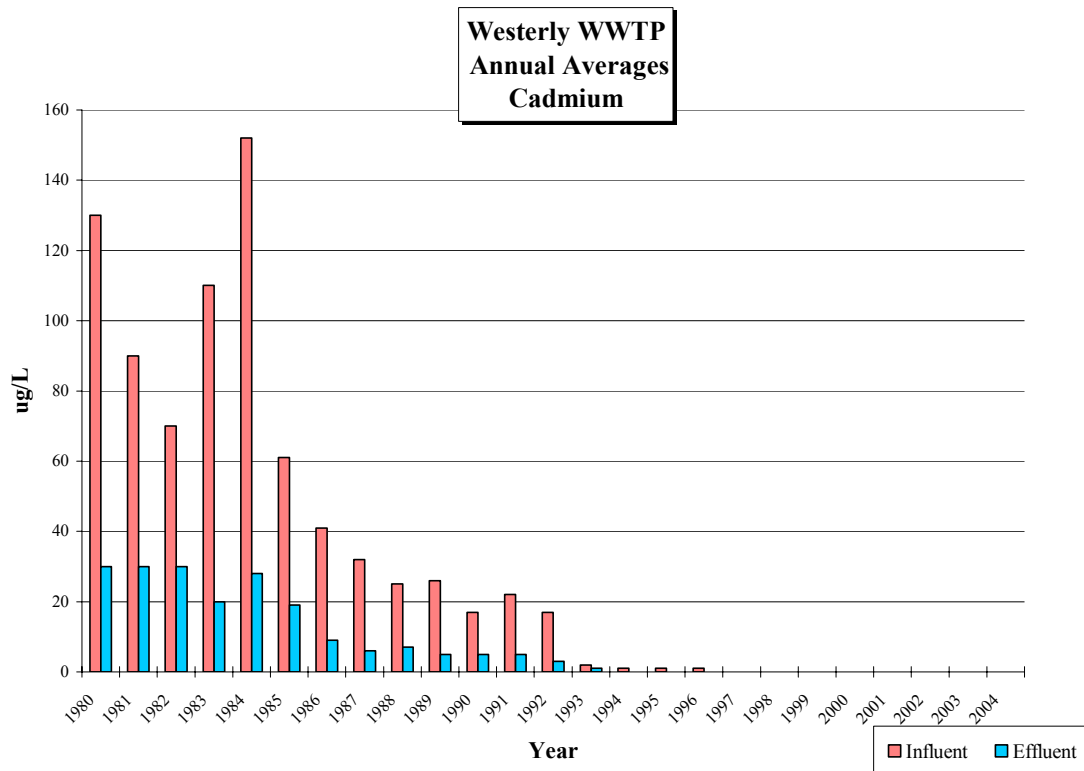
Appendix B: Southerly WWTC Influent and Effluent Annual Average Heavy Metal Concentrations

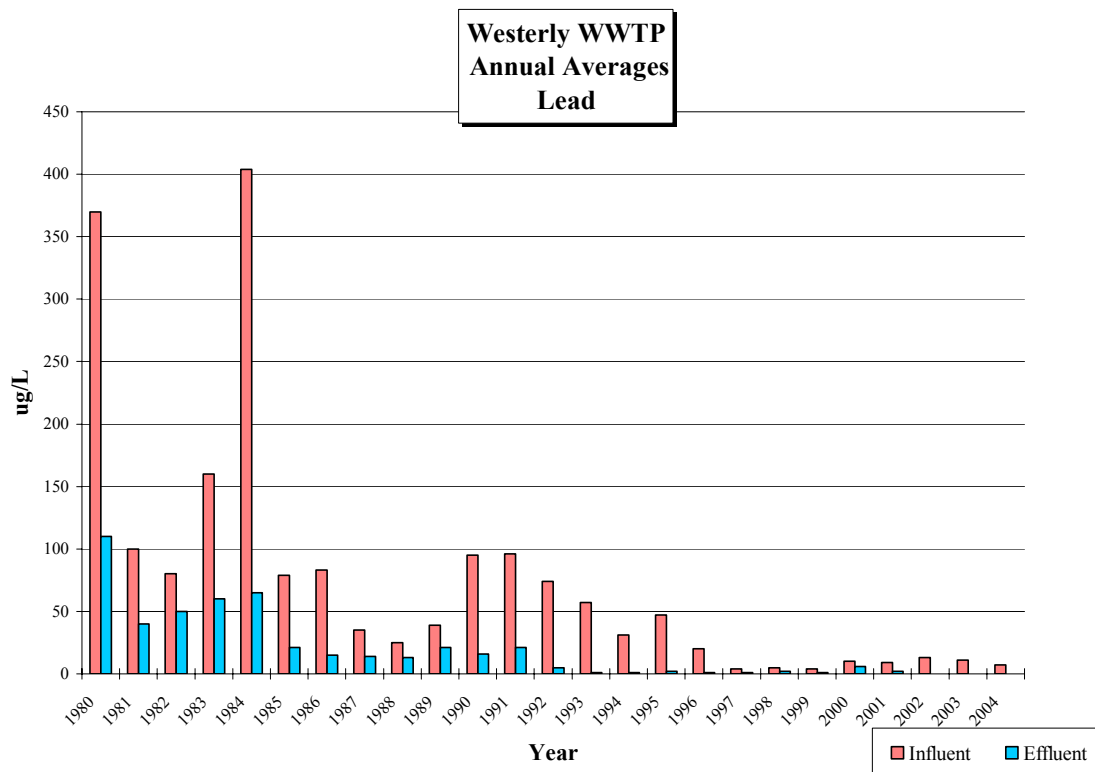
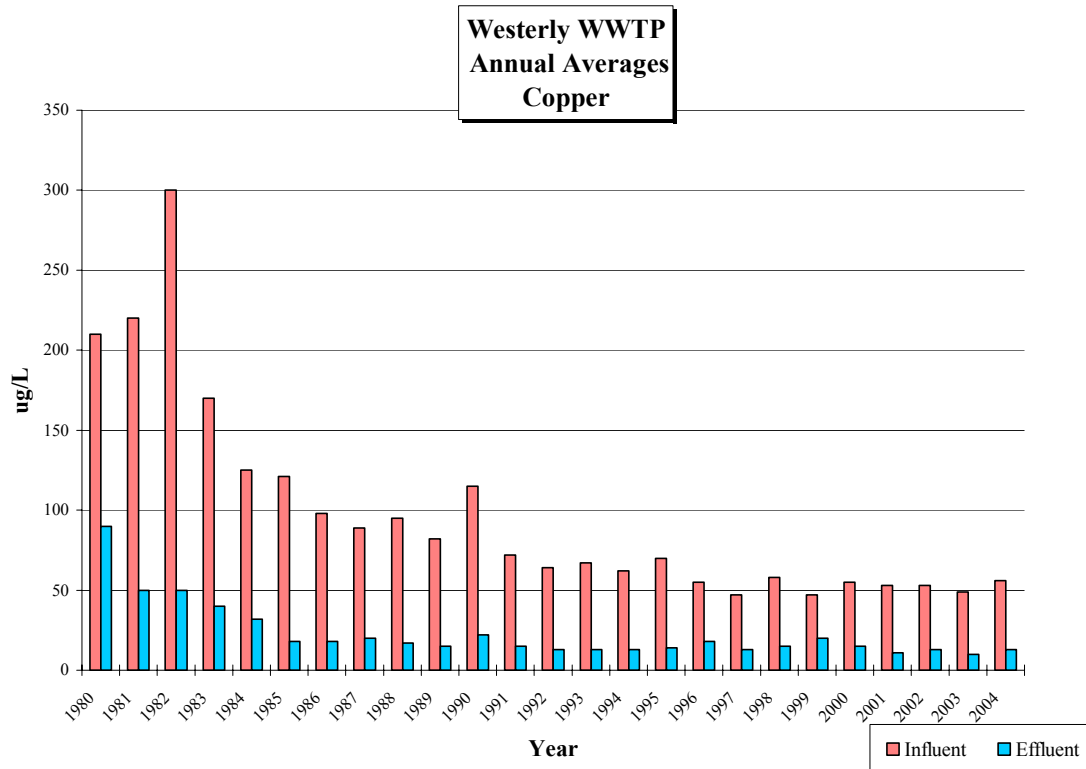


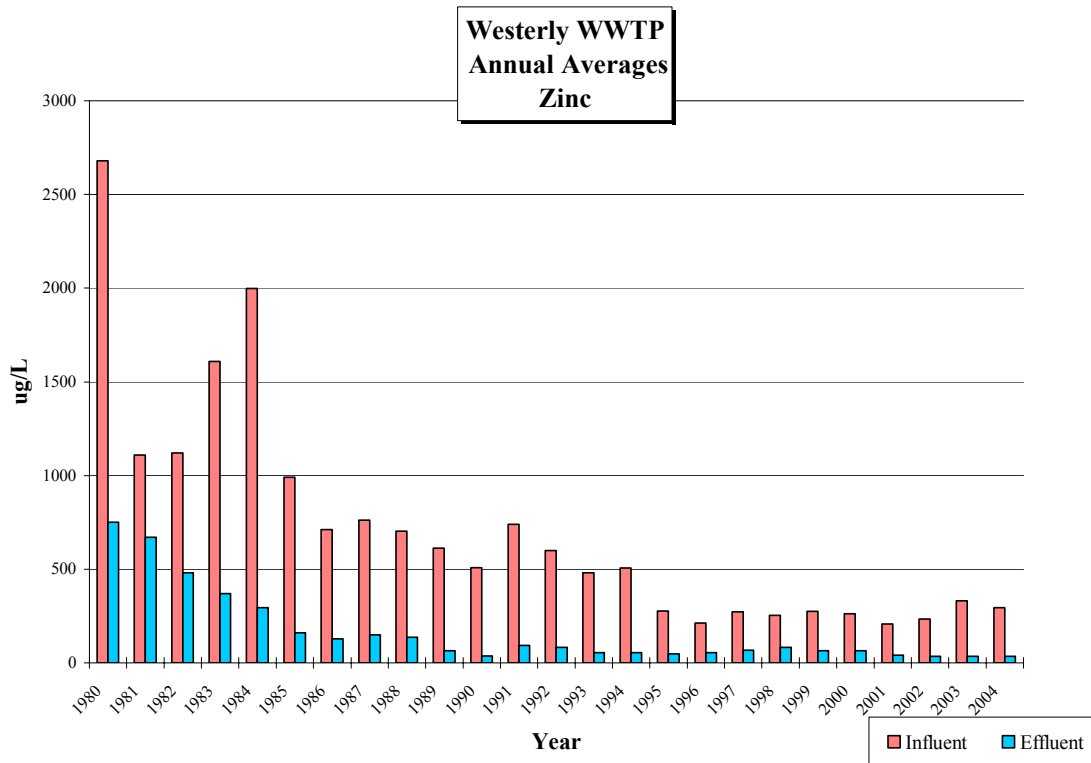
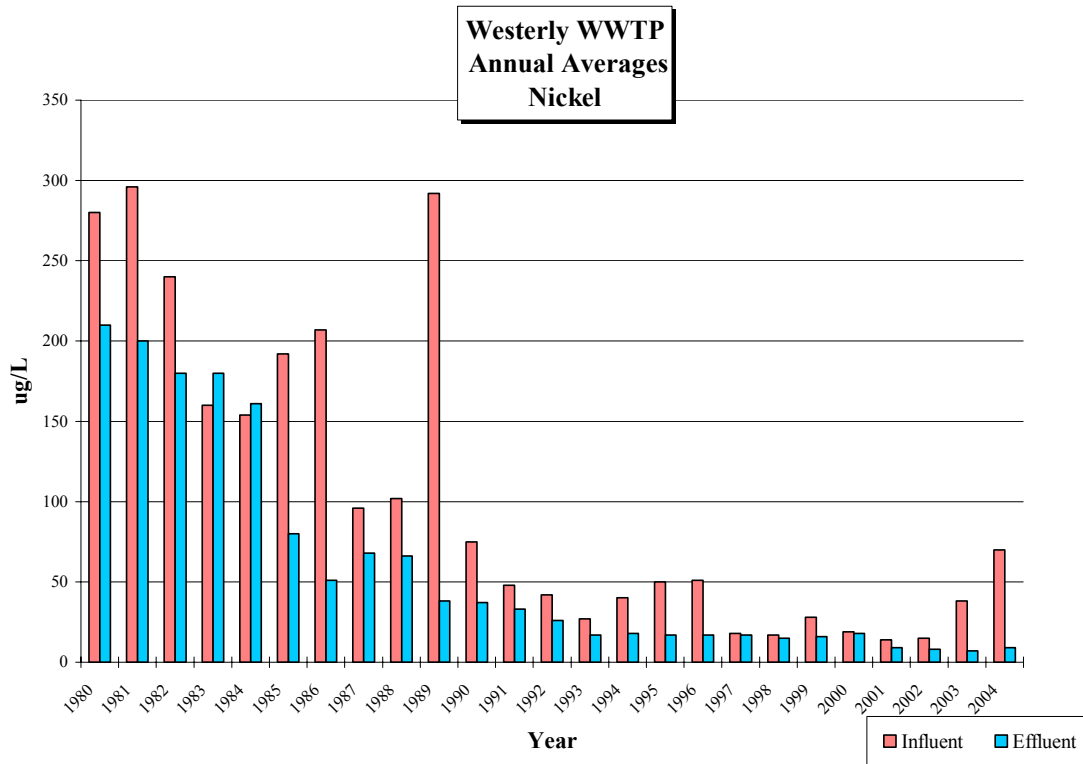




Appendix C: Westerly WWTP Influent and Effluent Annual Average Heavy Metal Concentrations

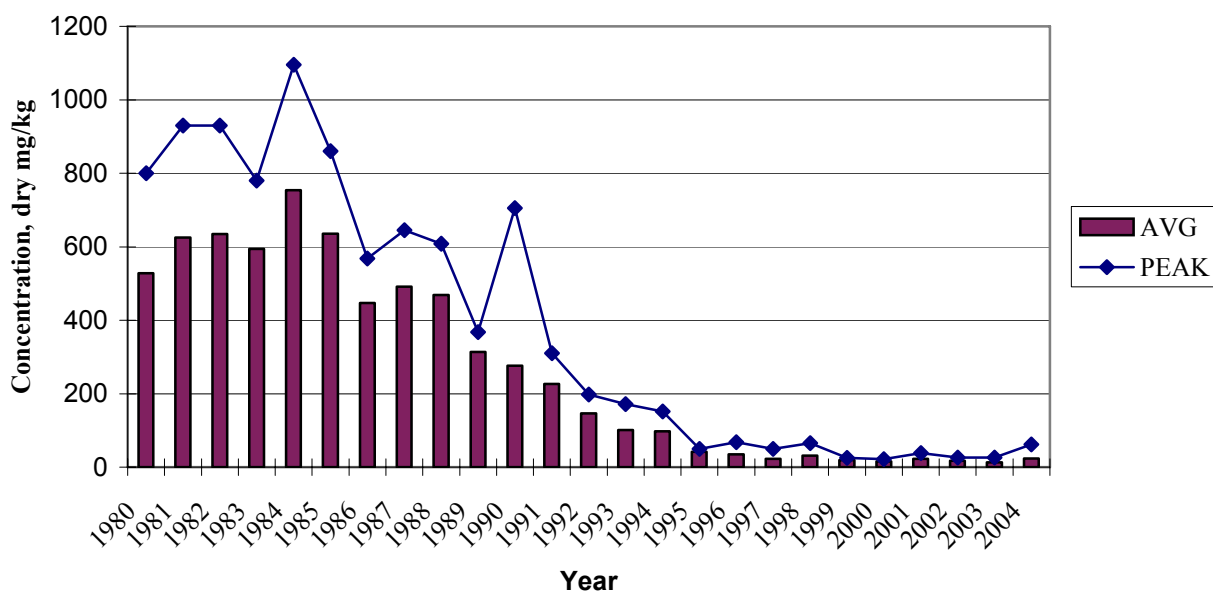




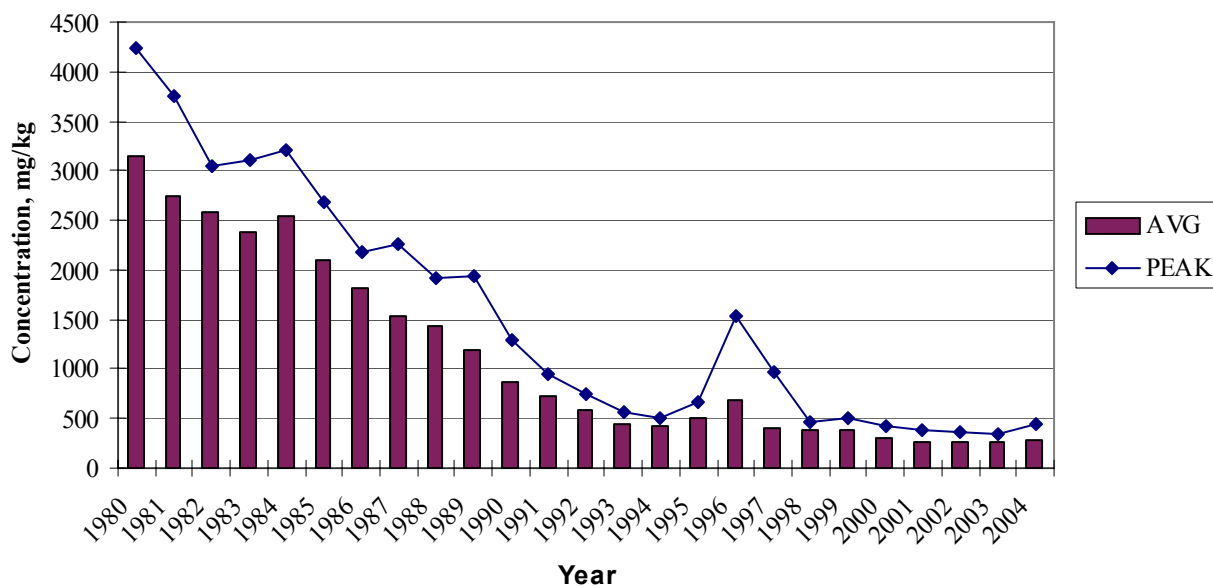


Appendix D: Southerly WWTC Heavy Metal Concentrations (dry weight basis) – Annual Averages and Monthly Peaks

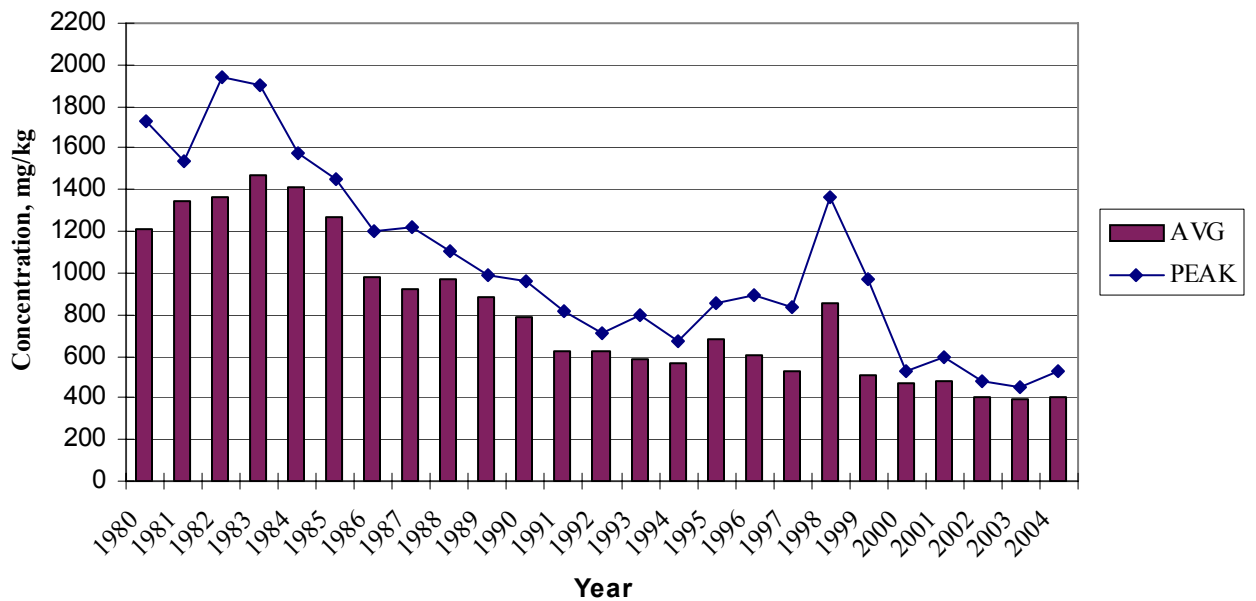
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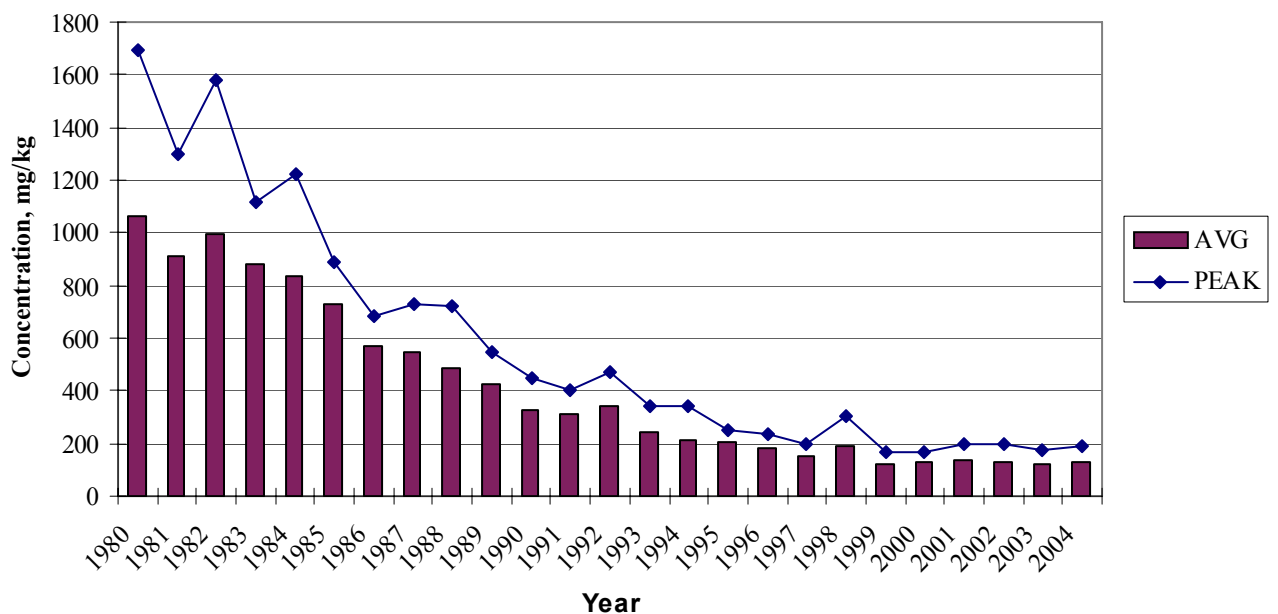
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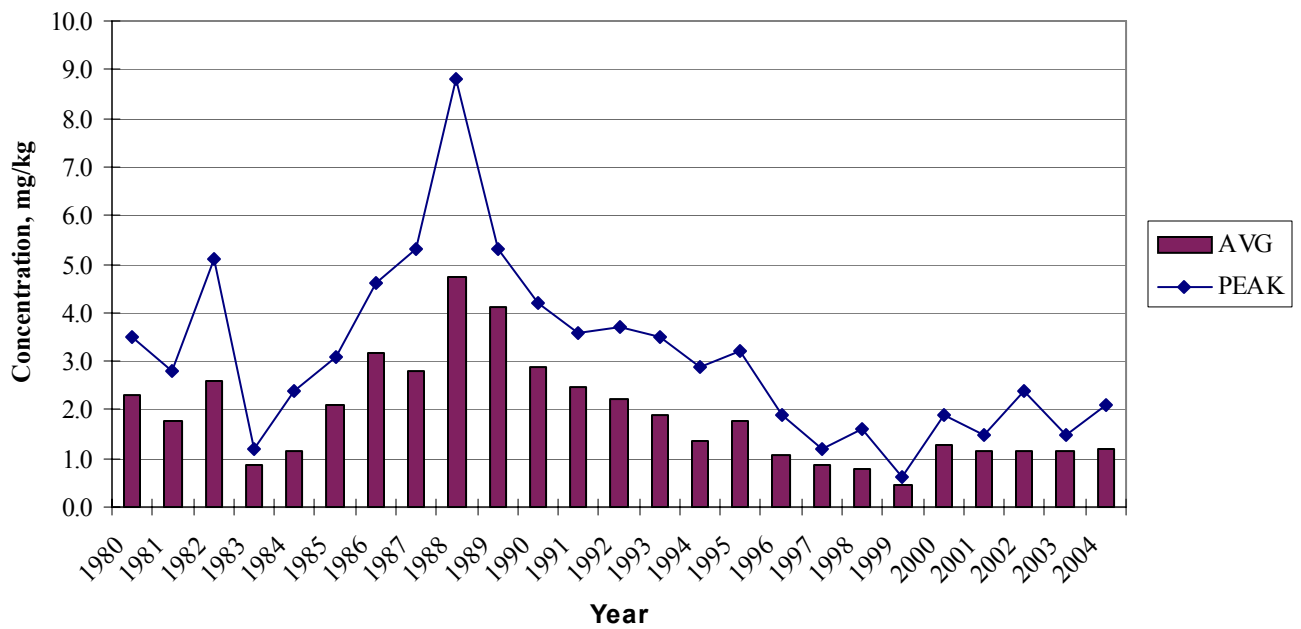
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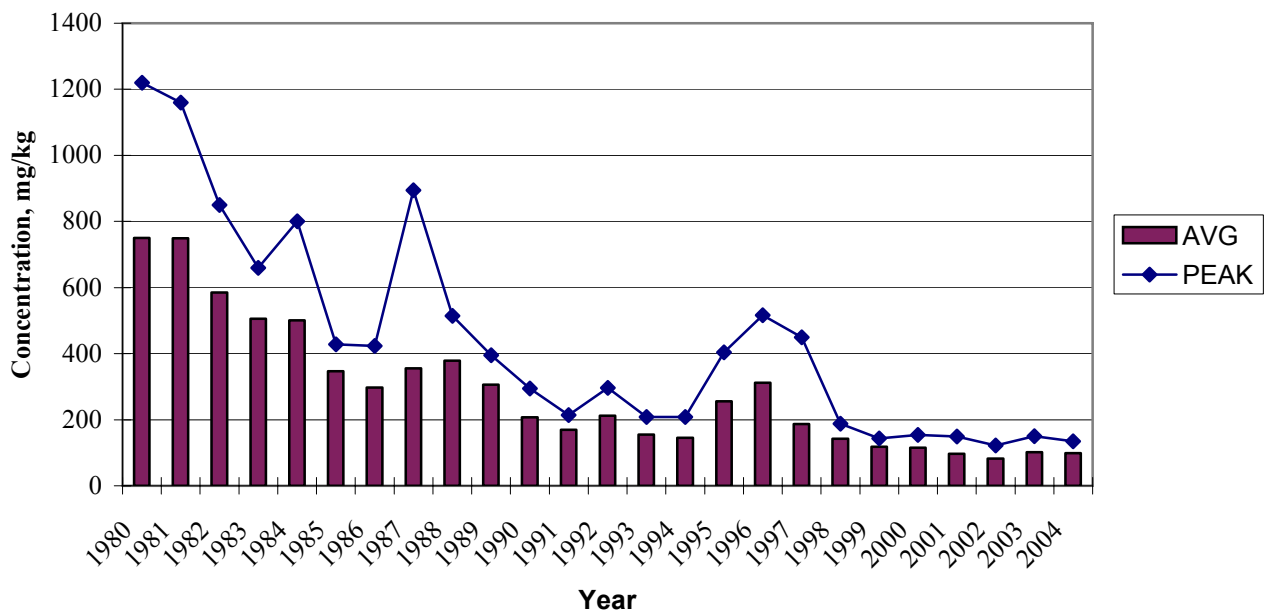
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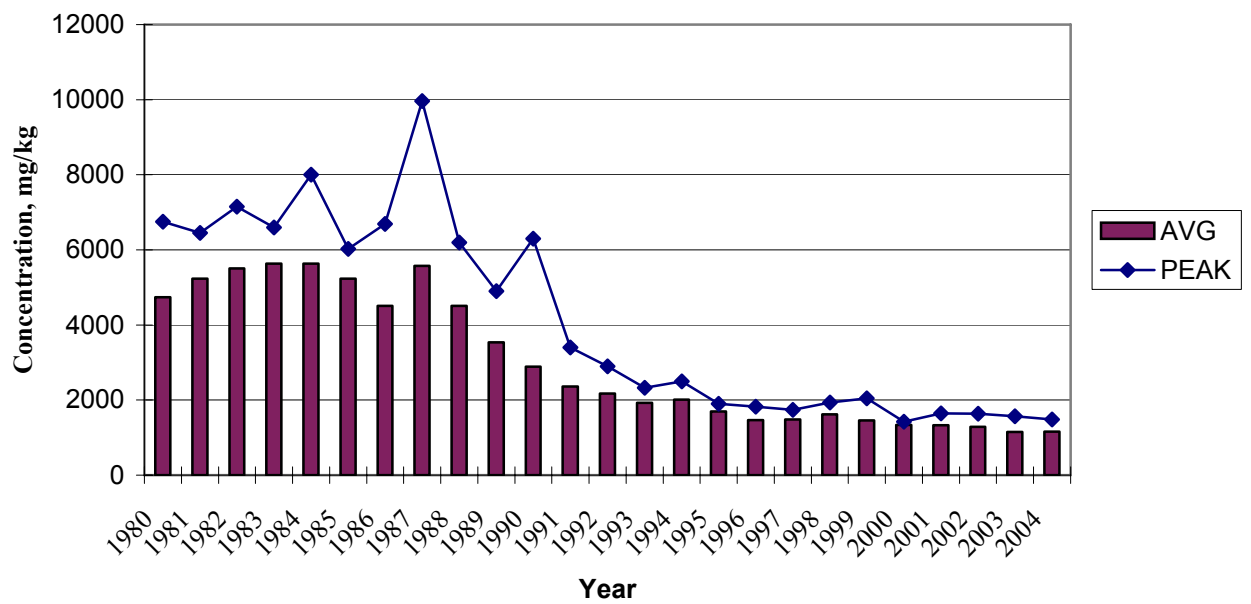
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Southerly WWTC Biosolids - Nickel

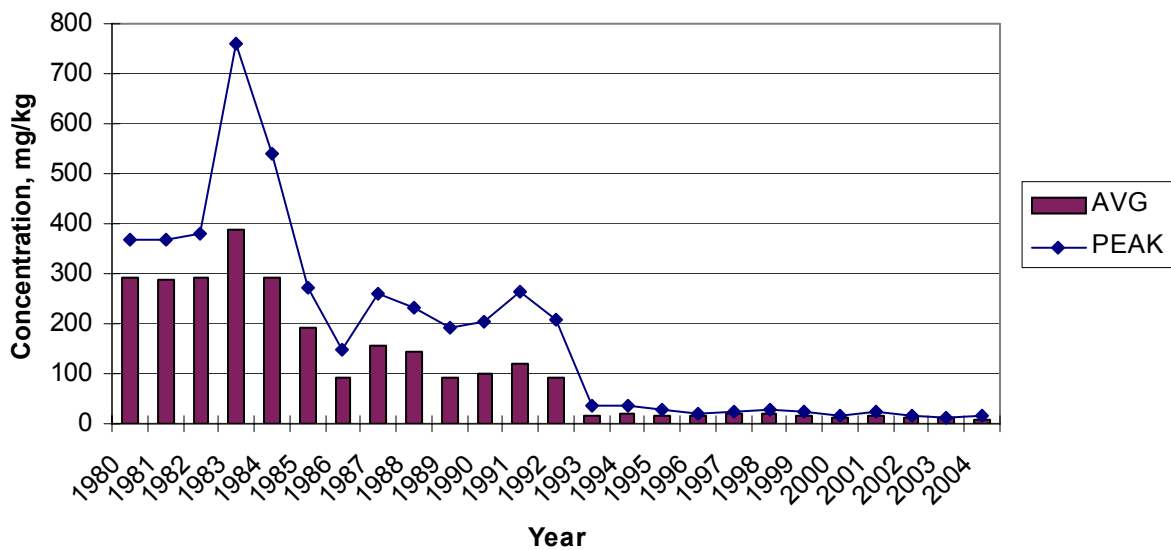


Southerly WWTC Biosolids - Zinc

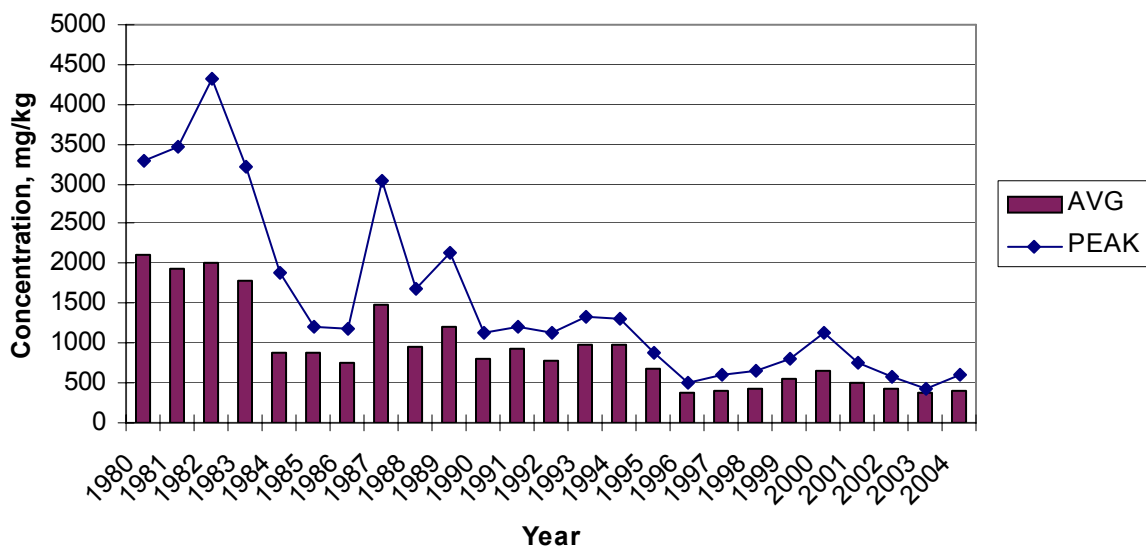


Appendix E: Westerly WWTC Heavy Metal Concentrations (dry weight basis) – Annual Averages and Monthly Peaks

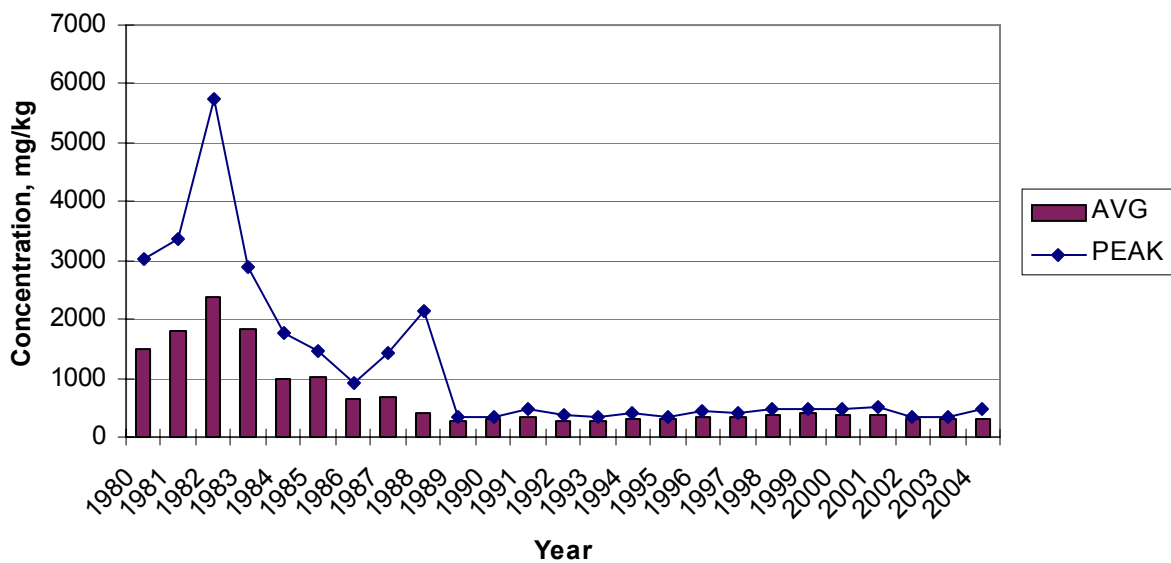
Westerly WWTP Biosolids - Cadmium



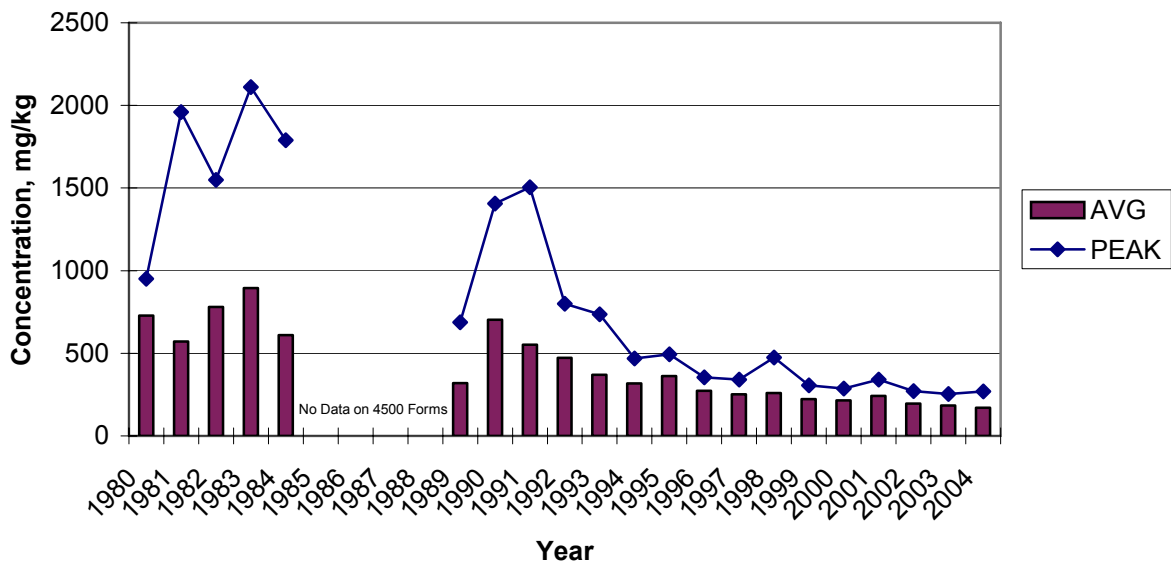
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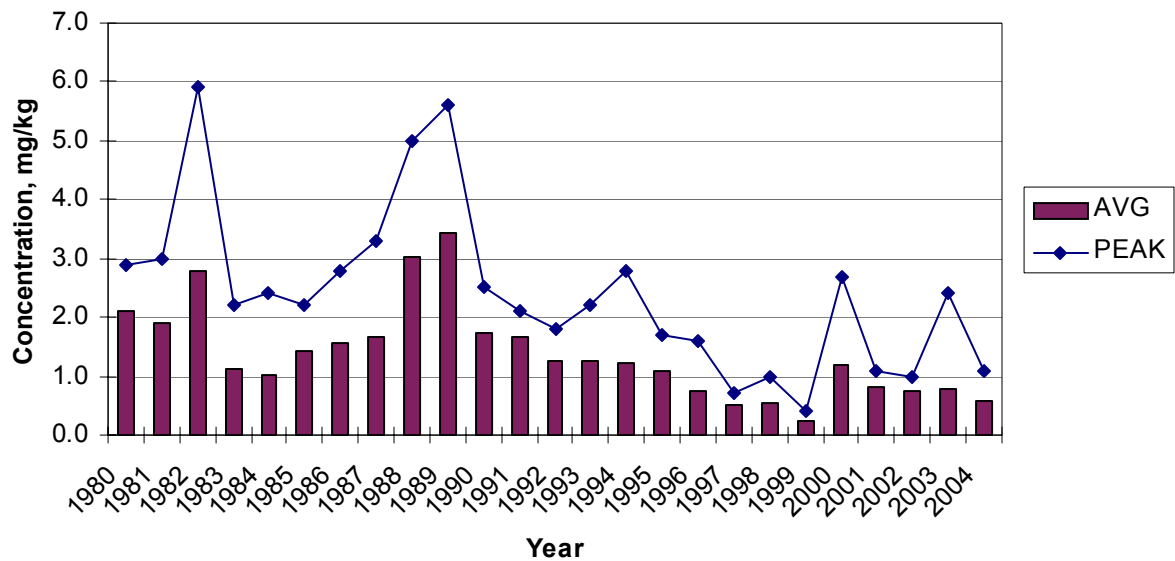
Westerly WWTP Biosolids - Copper



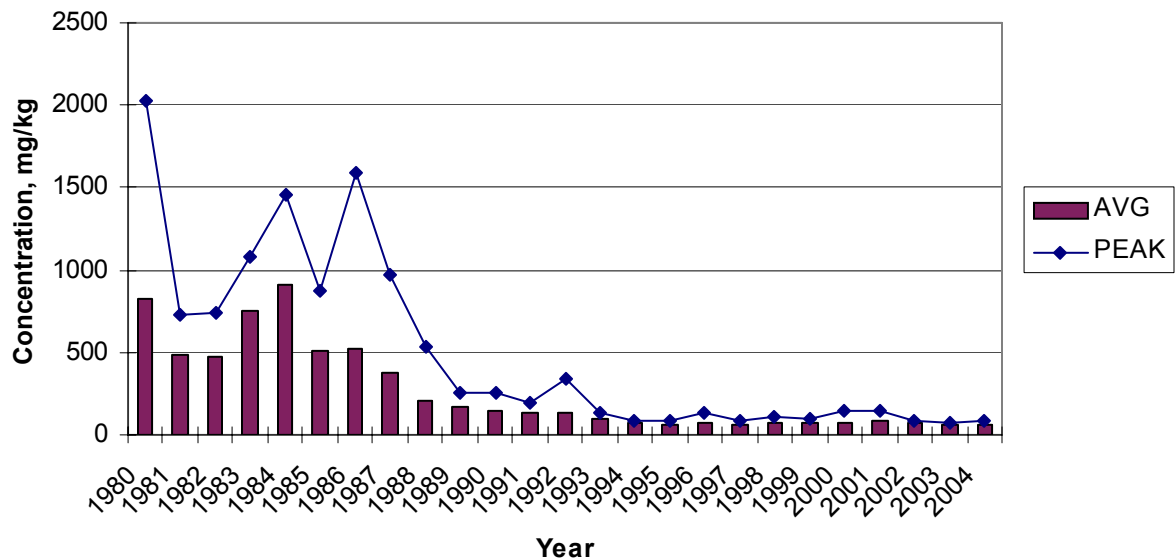
Westerly WWTP Biosolids - Lead



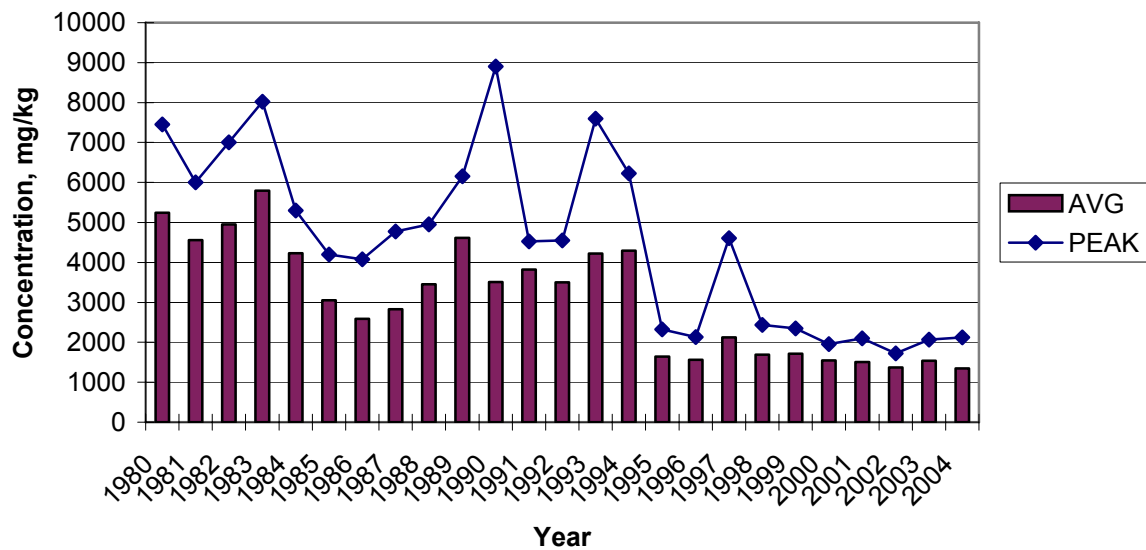
Westerly WWTP Biosolids - Mercury



Westerly WWTP Biosolids - Nickel



Westerly WWTP Biosolids - Zinc



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Dear Assistant Administrators:

The National Association of Clean Water Agencies (NACWA)¹ and its members would like to express their serious concerns with the U.S. Environmental Protection Agency's (EPA or Agency) current rulemaking efforts regarding its voluntary remand of the Commercial and Industrial Solid Waste Incineration ("CISWI") Unit Rule following the challenge to the rule in *Sierra Club v. EPA* (No. 01-1048, D.C. Cir).

NACWA also has serious concerns with the parallel EPA effort to develop a definition of solid waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA) (EPA-HQ-RCRA-2008-0329) as part of the Agency's response

¹ NACWA is the leading representative of over 300 publicly owned wastewater treatment agencies across the nation. NACWA's membership collectively treats and reclaims over 18 billion gallons of wastewater per day and, while our membership includes utilities of all sizes, we represent the vast majority of major metropolitan agencies across the country. As leading environmental stewards, NACWA members work to ensure that the significant water quality improvements made in the 37 years since the Clean Water Act was passed continue and are not reversed.

to *Natural Resources Defense Council v. Environmental Protection Agency*, 489 F.3d 1250 (D.C. Cir. 2007) [hereinafter *NRDC*] (vacating EPA's definitions of "commercial or industrial solid waste incineration unit" and "commercial or industrial waste").

EPA has informed NACWA that, as part of these rulemaking efforts, it is considering defining solid waste under RCRA Subtitle D to include municipal sewage sludge (biosolids). NACWA believes this approach is inconsistent with EPA's charge under the Clean Air Act (CAA) provisions at issue and is very concerned about the negative and unintended impacts such an action would have on the lawful management of sewage sludge, including beneficial reuse via land application, surface disposal and incineration, which together account for the proper management of sludge.

As discussed further in this letter, NACWA urges EPA to consider a different approach that will satisfy the relevant CAA mandates while not disrupting long-standing management programs for municipal sewage sludge. NACWA requests a meeting with you and the relevant Agency staff to discuss this issue further.

NACWA believes that EPA's prior determination that sewage sludge incinerators (SSIs) are not subject to regulation as solid waste incineration units (SWIUs) pursuant to § 129 of the CAA is consistent with the plain language of the statute. In particular, publicly owned treatment works, including SSIs, are explicitly regulated under CAA § 112, and therefore cannot be regulated under CAA § 129. Furthermore, NACWA is concerned that EPA's current rulemaking efforts to respond to the narrow CAA-specific *NRDC* decision will undermine the regulatory harmony that exists among the water, air, and waste programs that together provide comprehensive regulation of sewage sludge, including the management of sewage sludge in SSIs. Defining solid waste to include sewage sludge will create enormous uncertainty regarding the recycling and disposal programs that fully operate in compliance with the 40 CFR Part 503 (Use or Disposal of Sewage Sludge) regulation's clear mandates that are protective of human health and the environment.

NACWA urges EPA to:

- (1) Maintain its existing regulatory determination that SSIs are not subject to § 129 of the CAA.
- (2) Develop a regulatory definition of solid waste that recognizes the Agency's past interpretations of the RCRA definition of solid waste, the Clean Water Act (CWA), and the CAA.

These actions will maintain the careful regulatory balance that exists among all of these programs by carving out sewage sludge and its uses from any new Subtitle D regulatory definition of solid waste when such sludge is regulated under § 405 of the CWA and Part 503 regulations.

The remainder of this letter provides a detailed discussion of NACWA's four key points:

- EPA is precluded from regulating SSIs under CAA § 129 because the statute expressly regulates SSIs under the POTW provisions contained in CAA § 112. SSIs are part of POTWs, as defined in CAA § 112.² As such, EPA is correct in its longstanding determination that SSIs are regulated under CAA § 112, not under CAA § 129, even if EPA reached this conclusion for different reasons.

² CAA § 112 incorporates by reference the CWA definition of "treatment works."

- Regulation of SSIs under CAA § 112 is also consistent with the comprehensive program for regulation of POTW sewage sludge that has been in place for many years pursuant to broad CWA and RCRA mandates. These mandates, which predate the 1990 CAA Amendments under which CAA § 129 was added, provide a comprehensive and cohesive regulatory framework for the safe use and disposal of sewage sludge, including incineration and other beneficial uses. Regulating SSIs under CAA § 129 would significantly alter these longstanding programs' clear distinction between sewage sludge and solid waste and would severely disrupt and undermine these primary national programs for regulating the use and disposal of sewage sludge. There is nothing in CAA § 129 or its legislative history to suggest that Congress intended to dismantle or in any way disrupt the existing framework for sewage sludge management. To the contrary, Congress' express inclusion of POTWs, including SSIs, under CAA § 112 signifies a clear intent to provide for any further regulation of air emissions from SSIs under the CAA's § 112 framework.
- EPA has already properly determined that SSIs are not subject to regulation under CAA § 129. The Agency's determination is the result of more than 10 years of notice and comment rulemaking, judicial challenges, and negotiations involving all interested parties. Additional public comment submitted during EPA's prior reconsideration of this issue did not generate new information that would alter EPA's analysis. Furthermore, nothing in the *NRDC* decision warrants a different conclusion, because that case did not evaluate whether SSIs are regulated under CAA § 112 or § 129.
- Including sewage sludge in any new Subtitle D definition of solid waste would create confusion over past interpretations of the RCRA definition of solid waste and lead to cascading regulatory consequences that would call into question biosolids management programs under current federal and state law. This will also undermine the express right that Congress preserved to local communities to make local choices about sewage sludge management. EPA is obligated to uphold the carefully crafted regulation of sewage sludge, including sewage sludge incineration, which harmonizes the CAA, CWA, and RCRA authorities. Preserving the existing regulatory framework is not merely good policy, it is compelled by Congress under § 112 of the CAA (directing that POTWs be regulated under § 112), § 1004 of RCRA (defining solid waste to exclude solid material in domestic sewage), and 405 of the Clean Water Act (establishing a comprehensive regulatory framework for the solid material in domestic sewage).

NACWA urges EPA to adhere to Congress' clear intent to provide for the safe use and disposal of sewage sludge, to preserve local control over these management choices, to encourage the beneficial use of sewage sludge, and to preserve incineration as a safe, viable, and cost-effective management practice for sewage sludge where applicable, consistent with the clear and longstanding intent of Congress and EPA. EPA may do so and still fulfill the obligations created by the *NRDC* decision, by adopting the approach set forth in this letter.

I. Congress Regulated Air Emissions From POTWs, Including SSIs, Under CAA § 112, Not Under CAA § 129

Clean Air Act § 112(e)(5) requires EPA to establish emission standards for hazardous air pollutants (HAPs) for publicly owned treatment works (POTWs). In particular, this provision states:

The Administrator shall promulgate standards pursuant to subsection (d) of this section applicable to publicly owned treatments works (as defined in Title II of the Federal Water Pollution Control Act [33 U.S.C.A. § 1281 et seq.]) not later than 5 years after November 15, 1990. 42 U.S.C. § 7412(e)(5).

The definition of “treatment works” contained in the Clean Water Act is broad and includes “*any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage . . . or necessary to recycle or reuse water . . . and any works... that will be an integral part of the treatment process (including land for the storage of treated wastewater in land treatment systems prior to land application) or is used for ultimate disposal of residues resulting from such treatment.*” 33 U.S.C. § 212(2)(A) (emphasis added). This language clearly encompasses the many areas of a POTW used to manage sewage sludge, including treatment and storage equipment and areas, land areas where sludges are managed, and incinerators that are “used for ultimate disposal of residues resulting from such treatment.”

Thus, CAA § 112(e)(5) regulates air emissions for HAPs from POTWs broadly and without limitation. As such, SSIs operated by POTWs, and other areas of POTWs used to generate and manage sludge, are “treatment works” under the CWA, and thus are covered by CAA § 112(e)(5). CAA § 112(n)(3) underscores this conclusion, as it expressly provides authority for EPA to work with POTWs to study and characterize emissions for purposes of regulating these under CAA § 112(e). *See also* CWA § 405(f)(1) which requires permits for POTWs under § 402 of the CWA to include requirements for the use or disposal of sewage sludge.

EPA has long understood that SSIs are an integral part of POTWs. For example, under the early CWA Title II construction grants program, in which Congress included the “treatment works” definition noted above, EPA approved funding for many SSI construction, upgrade and expansion projects. Indeed, based on information NACWA has collected, many if not all of the 231 SSIs operated by municipalities in the United States were constructed or upgraded at some point in time with federal construction grants. This would have been impossible if EPA did not consider SSIs to be part of “treatment works.” EPA’s recognition that sewage sludge management, including incineration, is an inherent part of POTW operations for which federal funding was made available, is reflected in the primary regulatory program for sewage sludge management, the “Part 503” program,³ which was developed under the authority of CWA § 405 and RCRA. For example, EPA has stated that:

Sewage sludge has been an important concern of the Agency since 1972, when EPA, through the Federal Water Pollution Control Act construction grants program, began assisting in the financing of wastewater treatment facilities. 58 Fed. Reg. 9248, 9260 (Feb. 19, 1993).

Treatment works treating domestic sewage, as noted above, include facilities dedicated to the disposal of sewage sludge (i.e., surface disposal sites and incinerators). 58 Fed. Reg. 9248, 9359 (Feb. 19, 1993). *See also* 40 CFR 122.2 in which treatment works is defined to include sewage sludge treatment systems.

Thus, it is apparent that EPA has long understood, as has Congress, that SSIs are “treatment works” under the CWA. Congress’ intentional use of this well-understood term in CAA § 112 has no other conceivable meaning. EPA should, therefore, continue to include SSIs as part of POTW regulation under CAA § 112.

³ 40 CFR Part 503, Standards for the Use or Disposal of Sewage Sludge.

The legislative history of CAA § 112 also indicates that Congress intended the air emissions from POTW operations covered by CAA § 112 to include air emissions from SSIs. For example, Congress indicated that “The Administrator is specifically directed to include publicly owned treatment works (as defined in the Clean Water Act) and [certain RCRA facilities] among the categories of major sources pursuant to this subsection....The Agency has also indicated that air emission standards for POTWs may be promulgated under the Clean Water Act. There is no standard of protection of either human health or the environment from releases to air under that Act. It is more likely that appropriate standards would survive a legal test, if established pursuant to these new authorities of § 112 of the Clean Air Act.”⁴

The CWA-derived air emission standards that CAA § 112 was intended to supplement include those that control emissions on SSIs. Thus, Congress was well aware that air emissions from SSIs were already regulated by the CWA § 405 requirements and chose § 112 as the means to update these requirements as warranted by the applicable protection requirements. In addition, POTWs and SSIs are both included on a list of source categories intended to be regulated under CAA § 112.⁵ By contrast, as NACWA has noted in previous correspondence to EPA, the legislative history of CAA § 129 is silent as to both POTWs and SSIs.

Further demonstrating Congress’ clear direction, EPA has already regulated SSIs as intended under CAA § 112, by identifying SSIs as an area source category under CAA § 112. 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. That initial list included sewage sludge incinerators as a source category. 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). In 1999, EPA promulgated a NESHAP under § 112 for the treatment plant part of a POTW. 64 Fed. Reg. 57572 (Oct. 26, 1999). Significantly, while the definition of POTW treatment plant is appropriately focused on the treatment part of a POTW, the definition of POTW in that rule is much broader and encompasses everything that is eligible to receive grant assistance under Title II of the CWA. See, 40 CFR 63.1595. 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. 67 Fed. Reg. 6521 (Feb. 12, 2002). EPA retains the authority to regulate SSIs under § 112. For example, in June 2002, after EPA deleted SSIs from the source category list for the development of NESHAPs, EPA added SSIs to the list of area source categories under §§ 112(c) and 112(k) of the CAA. 67 Fed. Reg. 43112 (Jun. 26, 2002; 67 Fed. Reg. 70427) (Nov. 22, 2002).

CAA § 129(h)(2) states that: “no solid waste incineration units subject to performance standards under [§§ 129 and 111] shall be subject to standards under [§ 112(d)].” Thus, the language of CAA § 129(h) makes clear that EPA’s regulation of sources under CAA § 129 or CAA § 112 is mutually exclusive. EPA has consistently recognized that sources regulated under CAA § 112 cannot also be regulated under CAA § 129. Since area source categories are subject to the promulgation of emission standards under CAA § 112(d), SSIs cannot also be regulated under CAA § 129. As the D.C. Circuit exhorted EPA in *NRDC*, EPA must follow the plain language of the statute. In this case, however, the plain language of the statute directs EPA to regulate POTWs (including SSIs) under § 112. Nothing in § 129 leads to a different result because it is axiomatic that a specific provision of a statute is controlling over a general provision. “However inclusive may be the general language of a statute, it

⁴ Senate Report No. 100-231, Committee on Environment and Public Works, 1990 CAA Legislative History 9436, 9668.

⁵ Senate report No. 101-228, Committee on Environment and Public Works, 1990 CAA Legislative History 8338, 8528.

will not be held to apply to a matter specifically dealt with in another part of the same enactment.” *Fourco Glass Co. v. Transmirra Products Corp.*, 353 U.S. 222, 228 (1957).

The bottom line is that Congress mandated, and EPA must stand by its original and longstanding determination, that POTW SSIs fall under CAA § 112. Indeed, EPA has already adopted regulations based on this conclusion. While EPA can change its mind on policy issues if the Agency develops a reasoned analysis to support the change, *Motor Vehicle Mfrs. Ass'n. v. State Farm Mutual*, 463 U.S. 29 (1983), it cannot act contrary to a statutory directive that compels a singular outcome, as it does here. *NRDC* does not alter these fundamental principles of statutory construction and, indeed, is based on an admonition to EPA to apply the CAA as written. Any action seeking to regulate SSIs under CAA § 129 rather than CAA § 112 would be contrary to the statute.

II. CAA § 129 Does Not Apply to SSIs

CAA § 129 applies to solid waste incineration units that combust solid waste. To determine the coverage of CAA § 129, EPA must look at both components – whether a material being combusted is a solid waste and whether the combustion unit is of the type specified by Congress. SSIs do not fit under either of these components. As noted above, SSIs are part of POTWs regulated under CAA § 112 and thus are not included in the types of combustion units Congress sought to regulate under CAA § 129. This is clear from the statutory language in CAA § 129, as well.

The legislative history of CAA § 129 indicates that SSIs were not intended to be regulated as “solid waste incineration units.” The provisions now codified in CAA § 129 originated in a bill entitled “Municipal Waste Combustion Control Act of 1989,” introduced in Congress on January 25, 1989. S. 196, 101st Cong. (1989). The express purpose of the proposed legislation was to address the “garbage crisis” facing the nation in the late 1980s and to “establish the needed regulatory program to make *municipal waste incineration* an environmentally sound part of our Nation’s waste management.”⁶ While subsequent legislative history reveals Congress’ concern with other specific types of large incinerators in addition to municipal waste combustors (e.g., medical waste incinerators and industrial incinerators burning waste paper, wood, yard wastes, food wastes, batteries and plastics), Congress did not once mention POTW sewage sludge or SSIs as a type of incineration to be covered under CAA § 129, or in any way suggest that its concerns over the incineration of municipal solid waste extended to the incineration of sewage sludge. This silence in the context of CAA § 129 is fully consistent with the fact that Congress expressly covered POTWs and SSIs in CAA § 112.

The concept EPA is reportedly exploring, which would establish a regulatory definition of solid waste under Subtitle D of RCRA that includes sewage sludge, would upset the carefully wrought provisions of CWA § 405, the RCRA definition of solid waste, and the scope of the Domestic Sewage Exclusion which Congress included in order to *avoid* duplicative RCRA and CWA regulation of POTWs. Both Congress and EPA gave comprehensive and careful thought to the proper regulation of use and disposal of sewage sludge under CWA and RCRA authorities that were in place long before CAA § 129 was enacted. Nothing in CAA § 129 or its legislative history suggests that Congress provided EPA with authority to undo or seriously undermine the comprehensive sludge management programs already in place under these other laws. Moreover, EPA must recognize that these longstanding sewage sludge management regulations were not before the *NRDC* court. Although the court’s admonitions to EPA may superficially suggest that the court mandated a broad definition

⁶ *Id.* (emphasis added).

of solid waste for purposes of CAA § 129, such a reading simply makes no sense, particularly where it is clear that other types of incineration are covered in other Sections of the CAA. EPA has a responsibility to apply the court's decision carefully, recognizing both the limits of CAA § 129 and the mandates of unrelated statutes that would be adversely affected by a broad new definition of solid waste.

The discussion immediately below addresses the interplay between the CAA and RCRA and how it impacts the applicability of CAA § 129. Part III of this letter, which follows, addresses the CWA Part 503 regulations and programs developed under RCRA that provide a comprehensive regulatory framework for the management of sewage sludge. This discussion explains why, in addition to the CAA analysis, other laws prohibit EPA from regulating the combustion of sewage sludge as solid waste under CAA § 129.

A. Sewage Sludge Has Not Been Regulated as Solid Waste by EPA or Viewed as Solid Waste by Congress

Sewage sludges generated by POTWs, including those combusted in SSIs, have historically not been viewed as solid wastes by Congress and (as discussed in the next section) generally have not been regulated as solid wastes by EPA. Therefore, POTW sewage sludge should not be defined as solid waste for the purposes of the definition of “solid waste incineration unit” provided in CAA § 129(g)(1).⁷ CAA § 129(g)(6) specifically provides that the term “solid waste” is to have the meaning as set forth and established under RCRA.⁸

RCRA defines “solid waste” as:

Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage . . .* RCRA § 1004(27) (emphasis added).

Solid or dissolved material in domestic sewage is excluded from this definition – this exception is commonly referred to as the “Domestic Sewage Exclusion” under RCRA. The Domestic Sewage Exclusion expresses Congress' clear intent to forego RCRA regulation when a material is already regulated under the CWA.

While the legislative history of CAA § 129 is silent as to the definition of “solid waste” (other than, as discussed below, to make clear that Congress was primarily concerned with *municipal* solid waste), the Domestic Sewage Exclusion had been written into RCRA for 25 years at the time Congress passed the 1990 CAA Amendments. Accordingly, in incorporating RCRA's definition of “solid waste” in CAA § 129, Congress was well aware of the Domestic Sewage Exclusion encompassed in the definition of “solid waste” and of EPA's interpretation and application of that definition with respect to the regulation of sewage sludge from POTWs.

⁷ We also acknowledge EPA's statement in the Agency's 2000 regulatory agenda that sewage sludge *when combusted in SSIs* is a solid waste. 65 Fed. Reg. 23,430, 23,460 (Apr. 24, 2000). That statement, however, was not made in the context of a rulemaking preamble but rather in a semi-annual regulatory agenda and it has not been subjected to public comment. It also is countermanded by numerous statutory and regulatory provisions discussed herein, and is entitled to little weight.

⁸ CAA § 129(g)(6) (The term “solid waste” shall have the meaning established by the Administrator pursuant to the Solid Waste Disposal Act.)

Moreover, shortly after Congress passed the 1990 CAA, Congress amended RCRA to expand the scope of the Domestic Sewage Exclusion to cover Federally Owned Treatment Works. At the time of passage of this amendment (and after a year of debate and revision), Senator Chafee confirmed Congress' understanding that the Domestic Sewage Exclusion exempts POTW sludge from RCRA regulation:

Sewage treatment plants operated by local governments – POTWs – have a special exemption called the domestic sewage exclusion under RCRA. *If most of the waste received by a POTW is domestic sewage, their sludge and wastewater is exempt from hazardous industrial waste regulation even if they are also receiving hazardous industrial waste through sewer connections.* 138 Cong. Rec. 514755, 514758 (Sept. 23, 1992) (emphasis added).

Accordingly, in using the definition of “solid waste” under RCRA for purposes of defining the scope of CAA § 129, Congress was aware that POTW sewage sludge would be excluded from the CAA § 129(g) definitions, which, in turn, would preclude regulation of SSIs under CAA § 129. Express exemption of SSIs from the definition of “Solid Waste Incineration Units” under CAA § 129 was therefore unnecessary.

In RCRA rulemakings, EPA has similarly interpreted the scope of the Domestic Sewage Exclusion to include sewage sludge generated by POTWs. The clearest example of this exclusion of POTW sewage sludge from the definition of “solid waste” under the RCRA regulatory framework is found in EPA's promulgation of a rule to identify and list hazardous wastes for petroleum refinery process wastewaters. In the preamble to the Agency's 1990 Final Rule, EPA concluded that POTW sewage sludge falls within the Domestic Sewage Exclusion:

These wastes [P038 and K048 wastes] are being added to the list of [hazardous] wastes . . . in order to regulate sludges generated at wastewater treatment facilities on site at petroleum refineries as well as sludges generated at off-site wastewater treatment facilities.⁹ 55 Fed. Reg. 46,354, 46,364 (Nov. 2, 1990) (emphasis added).

Accordingly, both Congress and EPA have consistently recognized the possibility of duplicative regulation under both the RCRA and CWA programs and have consistently concluded that POTW sewage sludge should be excluded from regulation under RCRA as a waste. NACWA believes EPA must be consistent and confirm that POTW sewage sludge is not “solid waste” for regulatory purposes, and incinerators which combust POTW sewage sludge do not qualify as “solid waste incineration units” under CAA § 129.

B. EPA Properly Determined that SSIs are Not “Solid Waste Incineration Units” and, Therefore, They are Not Subject to Regulation Under CAA § 129

Section 129 of the CAA requires EPA to develop and adopt new source performance standards and emissions guidelines for “solid waste incineration units.” The potential scope of incineration units covered by CAA § 129 is expressly limited by the definition of “solid waste incineration units.” In CAA § 129(g)(1), Congress defined this term to mean:

⁹ It should be noted 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* and are not included in today's listings.

A distinct operating unit of any facility which combusts any solid waste material from any commercial or industrial establishments or the general public (including single and multiple residences, hotels, and motels)¹⁰ CAA § 129(g)(1).

As fully explained above (and in NACWA's March 17, 1997 and August 14, 2006 comment letters), biosolids generated by POTWs are not a "solid waste." Furthermore, sewage sludge generated by POTWs are not "from commercial or industrial establishments or the general public." Simply stated, incinerators which combust sewage sludge from POTWs are not "solid waste incineration units" and do not fall within the scope of EPA's duty to regulate pursuant to CAA § 129.

As EPA has previously determined, SSIs are not subject to regulation under CAA § 129 because the sludge combusted by SSIs come from POTWs, not "commercial or industrial establishments or the general public." POTWs are not properly characterized as "commercial or industrial establishments" or "the general public." The fact that the sewered population served by a POTW is assessed at a monetary rate for the collection and treatment services provided by the POTW does not transform it into a "commercial establishment" within the commonly understood meaning of that term, which must presumably be the meaning intended by Congress in CAA § 129(g)(1). Moreover, the fact that Congress and NACWA refer to POTWs as "plants" or "facilities," or that they refer to their works collectively as an "industry," does not transform POTWs into "commercial or industrial establishments" for purposes of CAA § 129. In enacting § 129, Congress was clearly concerned about municipal solid waste – trash, or garbage – generated by households and businesses. It was not at all concerned in § 129 with sewage sludge management, and adopting an approach to the CISWI definitions that ignores CAA § 112's coverage of POTWs and SSIs would be contrary to statute.

These conclusions about the scope of CAA § 129 are further validated when one considers that Congress explicitly included POTWs under CAA § 112 and prohibited regulation of sources under both CAA §§ 112 and 129. By doing so, Congress purposefully excluded POTWs, including SSIs, from the types of combustion units intended to be covered by CAA § 129.

In sum, Congress did not intend SSIs to be subject to CAA § 129 regulation. Section 129 applies to certain types of incinerators that combust "solid waste" as defined under RCRA, and Congress fully understood the exclusion of sewage sludge from the definition of solid waste at the time CAA § 129 was enacted. Furthermore, SSIs burn sewage residues, not solid waste "from commercial or industrial establishments or the general public." SSIs do not fall within this definition, and therefore, cannot be regulated under CAA § 129. The plain language of CAA § 129, as further validated by its legislative history, supports no other conclusion.

The holding in *NRDC* does not alter this analysis. The *NRDC* decision directs EPA to use RCRA's definition of solid waste in determining the scope of regulation for covered units under CAA § 129. Since POTWs and SSIs are not covered by CAA § 129, the *NRDC* decision does not require or authorize EPA to develop a definition of solid waste that includes or affects sewage sludge. Therefore, EPA's response to the *NRDC* decision should be appropriately narrow, as well, since POTWs and SSIs are explicitly covered under CAA § 112. EPA has

¹⁰ The definition of "solid waste incineration unit" excludes: (1) incinerators or other units which are Treatment, Storage and Disposal Facilities (TSDFs) under RCRA; (2) materials recovery facilities which combust waste for the primary purpose of recovering metals; (3) "qualifying small power production facilities" and "qualifying cogeneration facilities" which burn homogeneous waste (such as tires or used oil) for the production of electric energy or electric energy and steam or forms of useful energy; and (4) air curtain incinerators, provided that such incinerators burn only wood wastes, yard wastes, and clean lumber. CAA § 129(g)(1).

previously and properly determined that POTWs and SSIs are covered under CAA § 112, and, as such, the review directed by the court in *NRDC* simply does not apply to SSIs or to sewage sludge.

For all of these reasons, EPA lacks authority to regulate SSIs under CAA § 129. EPA previously made this determination and nothing in *NRDC* supports a different conclusion. Moreover, CAA § 112 clearly applies to SSIs, thereby precluding application of CAA § 129 to SSIs.

III. Sewage Sludge Management Is Already Comprehensively Regulated and Regulation of SSIs Under CAA § 129 Would Conflict with Existing Laws

The current regulatory harmony that exists for sewage sludge management is implemented through and supported by the comprehensive program that has been carefully developed under CWA § 405 and several key provisions and exclusions that exist under the RCRA regulatory framework. The statutory and regulatory provisions that contain and implement the sewage sludge management program distinguish between sewage sludge and solid waste, and thereby demonstrate that they are different types of material. As a result, EPA's reported effort to categorically deem sewage sludge a solid waste for regulatory purposes under RCRA Subtitle D, for the limited purposes of implementing the requirements of CAA § 129 (which does not apply to SSIs in any event), is misdirected.

If EPA moves forward with the notion of deeming sewage sludge a solid waste for regulatory purposes under RCRA Subtitle D, such action will severely conflict with the carefully crafted distinctions made by Congress and EPA over many years to provide for proper sewage sludge management. This action will also place RCRA regulatory responsibilities on POTWs that Congress fully intended would not apply due to strict regulation of POTWs under the CWA and its NPDES program. In addition, such action could severely limit how sewage sludge may be managed, which directly contravenes Congress' preservation in the CWA of local control over sewage sludge management options.

In short, if EPA erroneously deems sewage sludge a solid waste in an effort to guide its implementation of the CAA, it will wreak havoc on well-established programs for comprehensive sewage sludge management that Congress deliberately crafted with care under the CWA and RCRA many years before the enactment of CAA § 129 in 1990. NACWA doubts the existence of any support in the relevant statutes or legislative histories for such an approach, and we are equally confident that Congress had no intention for CAA § 129 to be read in a way that undermines these longstanding programs.

Instead of pursuing the approach EPA is reportedly considering, NACWA respectfully suggests that any new definition of solid waste that EPA believes is necessary in order to carry out CAA § 129 should be drafted to include an express regulatory exclusion for sewage sludge that is managed in accordance with other pre-existing regulatory requirements. The discussion below details the reasons why this approach is critical. Since CAA § 129 does not apply to sewage sludge, this approach should also serve EPA's purposes in implementing that provision consistent with *NRDC* and other legal requirements.

A. Interplay of RCRA and CWA § 405

Congress established the concept of a broad POTW exemption from the then-nascent federal solid waste laws as early as 1965.¹¹ This was an early recognition that a comprehensive solid waste program, designed primarily to address hazardous wastes, was not necessary to apply at 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 Solid Waste Disposal Act and RCRA included the Domestic Sewage Exclusion in explicit recognition of this critical policy choice.¹²

Indeed, as EPA began its long efforts to define “solid waste” and “hazardous waste” for purposes of Subtitle C of RCRA, the Agency explicitly understood and discussed the importance of the comprehensive federal sewage sludge management program it was beginning to develop to carry out Congress’ intent and to complement the RCRA rules being developed for solid wastes.

For example, in the 1980 preamble to EPA’s development of the Subtitle C regulations, EPA describes the importance, scope, and ultimate supremacy of the to-be developed CWA § 405 program, indicating that, once this program was in place, it would serve as the comprehensive regulations for use and disposal of sewage sludge. 45 Fed. Reg. 33,084, 33,102 (May 19, 1980) (“Once such a regulation is in place, sewage sludge will be exempted from coverage under other sets of regulations.”). Thus, 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. This recognition has not been challenged and stands today.

EPA proposed its CWA § 405 regulations in 1989, and enacted the final rules, known as the Part 503 regulations, in 1993 (40 CFR Part 503). As EPA explained at length in the preamble to the proposed rules, CWA § 405 established requirements for a comprehensive program to develop appropriate regulations for use and disposal of sewage sludge. EPA described the lengthy and complex process it undertook to develop rigorous scientific studies to ensure the safe management of sewage sludges whether they were to be used or disposed. 54 Fed. Reg. 5746, 5764-5791 (Feb. 6, 1989) (describing the Agency’s exposure assessment models, human health and environmental criteria, aggregate effects assessment, and the alternative regulatory approaches the agency considered when developing the sewage sludge disposal regulations). EPA also explained the major effort undertaken to ensure that the requirements of the CWA and RCRA as well as those in the CAA were considered and reconciled in the Part 503 program requirements. *Id.* at 5748 (noting that EPA “carefully examined the requirements of other media programs and media-specific statutes” in developing the proposed rules and “where possible . . . used the tools and standards developed under these other programs”). NACWA strongly urges EPA to be consistent with its past regulatory determinations and do the same in its forthcoming Subtitle D definition of solid waste.

In its CWA § 405 proposed rulemaking, EPA also described the relationship of the new Part 503 rules to RCRA regulations in 40 CFR Parts 257 and 258. Part 257, which establishes criteria for what constitutes a sanitary landfill versus an open dump, 44 Fed. Reg. 53,438 (Sept. 13, 1979), was promulgated under RCRA and the CWA. *See* 58 Fed. Reg. at 9261. EPA explained at that time that Part 257 exempted land application of sewage sludge

¹¹ Solid Waste Disposal Act, Pub. L. 89-272, 79 Stat. 992 (1965).

¹² 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).

because that activity is not solid waste disposal. *Id.* Additionally, Parts 258 and 503 together provided that, as long as disposal of sewage sludge in a municipal solid waste landfill met the specific requirements of Part 258 for that activity, this would constitute compliance with the Part 503 regulations and CWA § 405. When EPA promulgated the Part 503 final rule in 1993, the Agency recognized that the 1990 CAA Amendments might subject SSIs to new requirements in addition to the incineration standards already established in Part 503. *Id.* at 9276-9277.

Both the 1980 RCRA preamble and the CWA Part 503 rulemaking history, including the discussion of how Parts 257 and 258 apply when sewage sludge is permanently placed on land surfaces for disposal purposes, show the primacy of the CWA § 405 program with respect to the regulation of sewage sludge. 45 Fed. Reg. at 33101; 58 Fed. Reg. at 9261. These are all illustrative of the careful harmonization among CWA, RCRA and CAA requirements that EPA undertook in crafting the Part 503 regulations that serve as the cornerstone of proper sewage sludge management. EPA must not undo this carefully crafted reconciliation of statutory authorities as it seeks to address its obligations and, indeed, it would be arbitrary and capricious for EPA to do so.

This history of the RCRA and CWA interplay specifically related to sewage sludge indicates that Congress provided a thoughtful framework for how to safely and effectively exempt sewage sludge management from RCRA regulation, except in the case where the sewage sludge was hazardous. This framework cannot be reconciled with an approach by which all sewage sludge would be regulated as solid waste.

B. Part 503 Distinguishes Sewage Sludge and Solid Waste

In keeping with this framework, EPA's careful regulatory approach in the Part 503 regulations distinguishes between sewage sludge and solid waste. This is consistent with the distinctions drawn by Congress, and by EPA in its implementing regulations, that sewage sludge management is not the same as solid waste disposal. *See, e.g.,* 40 CFR Part 503 (identifying distinct standards for land application (Subpart B), surface disposal (Subpart C), or incineration (Subpart E) of sewage sludge); 58 Fed. Reg. at 9256-57 (distinguishing between sewage use and disposal methods).

In addition, EPA's description of sewage sludge as it moves through the wastewater treatment process indicates recognition that solids and dissolved substances are still present in sewage sludge before and after it is processed, and, following treatment, sewage sludge contains the residues of domestic sewage.¹³ This recognition indicates that EPA has always intended sludges being generated and processed during and after wastewater treatment, to be exempt from RCRA regulation when managed in accordance with the Part 503 regulations. EPA and Congress recognized that regulating the wastewater treatment process, which is fully regulated under the CWA, under RCRA would be duplicative.

Other EPA guidance also demonstrates the distinction the Agency has consistently made between biosolids and solid waste. For example, EPA's "Plain English Guide to the EPA Part 503 Biosolids Rule" (EPA/832/R-93/003 September 1994) states:

¹³ 58 Fed. Reg. at 9255-9256 (observing that unprocessed sewage sludge contains the solids and dissolved substances that were present in wastewater and that treatment processes also result in the development of sludge that contains organic materials and constituents that were present in the wastewater).

If municipal solid waste accounts for more than 30% (by dry weight) of the mixture of biosolids and auxiliary fuel, however, the municipal solid waste is not considered auxiliary fuel under Part 503. (Instead, the process would be covered by 40 CFR Part 60 and 61.)¹⁴

Also § 503.41(b) of the Part 503 Rule states:

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

All of this means that EPA must be extremely careful in any discussion that would imply that the Domestic Sewage Exclusion does not apply to these sludges. How EPA explains what it considers to be the scope of the Domestic Sewage Exclusion could have major impacts not only with respect to sludges still awaiting decisions about use or disposal, but also the regulatory status of the treated wastewater, which EPA has long recognized is “still considered to be domestic sewage for purposes of the Act [following treatment and solids removal in such treatment].” 44 Fed. Reg. 53,438, 53,440 (Sept. 13, 1979).

In sum, Congress’ intent with CWA § 405 and the Domestic Sewage Exclusion under RCRA was to ensure that sewage sludge was not subject to regulation as solid waste as long as it is properly managed under Part 503 requirements. These requirements, as noted, pull in RCRA-based requirements for land-based disposal of sewage sludge. As such, the general rule is clear that the generation and management of sewage sludge, including the beneficial uses or disposal of sewage sludge, are not solid wastes for RCRA regulatory purposes, as long as the management of these sludges complies with Part 503 regulations. EPA must be consistent with this past regulatory determination and ensure it creates no conflicts between the CWA and RCRA in its Subtitle D definition of solid waste.

C. Serious Consequences Would Ensur if EPA Asserts that the Domestic Sewage Exemption Only Applies up to a POTW’s “Headworks”

The framework noted above is clearly based on the understanding that solids moving through the wastewater treatment process, including sludges generated in that process, are subject to the Domestic Sewage Exclusion. This is consistent with the RCRA § 1004(26A) and (27) definitions of solid waste and “sludge,” which are tied to “discarded” and “waste” language and concepts. Sewage sludge generated by the treatment process may be beneficially used in a number of ways. Therefore, to deem it solid waste as it is generated in the treatment process, or even as it undergoes further processing prior to being removed “from” the treatment plant, contravenes these fundamental RCRA principles. Case law under RCRA is clear that the statute regulates as solid wastes only truly discarded materials. *Cordiano v. Metacon Gun Club, Inc.*, 2009 U.S. App. LEXIS 16980 (2d Cir. July 31, 2009) (discussing at length the definition of “solid waste” and noting that RCRA requires a showing that materials are “discarded”).

¹⁴ Page 81, third paragraph, second sentence.

In fact, not all sewage sludge is discarded or disposed; indeed, some is beneficially used by recycling nutrients to farm land or generating energy in combustion units. EPA has recognized this in the Part 503 distinctions between use and disposal. This regulation already provides a cogent, well-thought out and well-understood framework. There is no need for EPA to invent a new framework for purposes of an unrelated and inapplicable CAA provisions.

In addition, the Domestic Sewage Exemption applies without condition to “solid or dissolved material in domestic sewage.” A practical consideration of what this means in the context of POTW operations also demonstrates the illogic of EPA seeking to apply the Domestic Sewage Exclusion at a POTW’s headworks.

For example, solids in domestic sewage do not drop out at the headworks of a POTW; instead, solids that enter the headworks are part of what is treated during the treatment process. Thus, disconnecting the Domestic Sewage Exclusion at the headworks is contrary to the statutory definition and common sense. Moreover, sewage sludge is both a product of the wastewater treatment process as well as material that provides a treatment function during this process. Applying the Domestic Sewage Sludge Exclusion at the headworks fails to recognize this and, again, would violate the statutory definition. Finally, decisions about use or disposal occur after this processing is complete. If EPA applies the Domestic Sewage Sludge Exclusion at the headworks, this dictates a regulatory status for treatment process material well ahead of decisions about its management disposition. This approach will severely limit local choices about sewage sludge management, which is directly contrary to the requirements of CWA § 405.

This practical review demonstrates that a regulation that would apply the Domestic Sewage Exclusion only up to the headworks of a POTW would ignore how the wastewater treatment process works in reality and undercut the broad RCRA exemption Congress intended for CWA-regulated POTW operations. The unintended result of such a reading would be to give POTWs hazardous waste generator responsibilities for material that enters the treatment works, *see, e.g.*, 40 CFR 262.4 (hazardous waste determination). Such an outcome is contrary to Congress’ intent, as Congress created the Domestic Sewage Exclusion to avoid duplicating CWA regulations already being implemented by POTWs with new RCRA obligations.

D. EPA’s Suggested Approach Would Violate RCRA § 1006(b)

RCRA § 1006(b) requires EPA to integrate RCRA requirements with the requirements of the CWA and the CAA, as well as other laws. EPA is reportedly considering an approach that would deem sewage sludge a solid waste in order to promulgate a rule under a CAA provision that does not even apply to POTWs. Such an action would violate EPA’s non-discretionary duty under RCRA. Furthermore, developing an interpretation of the Domestic Sewage Exclusion or of the definition of solid waste that eviscerates the CWA § 405 program like wise would violate EPA’s duty of integration. Nothing in CAA § 129 suggests Congress intended the Draconian approach EPA is reportedly considering. Indeed, CAA § 129(g) explicitly states that the definitions contained therein (including the definition of solid waste incineration unit and of solid waste) are for purposes of CAA § 306 [federal procurement] and “this section *only*” (emphasis added). Thus, any effort by EPA to develop a broadly applicable definition of nonhazardous solid waste goes well beyond what is authorized by or required to implement CAA § 129.

In sum, any definition of solid waste or regulatory provision that would subject POTWs to regulation under RCRA would violate several other federal laws and would wreak havoc on existing and longstanding regulatory programs for safe and effective sewage sludge management programs that are protective of human health and the environment. Furthermore, such action is unnecessary for EPA to fulfill its duties under CAA § 129, since that provision does not apply to POTWs or SSIs.

E. SSI Emissions Are Already Stringently Regulated Under Part 503 / CWA § 405

Emissions from SSIs are already heavily regulated by other Congressionally-mandated, comprehensive regulations that are adequately protective of human health and the environment. Accordingly, no public health or environmental benefit will be realized from the expensive control measures that CAA § 129 would impose if SSIs were erroneously included in the EPA's proposed rule for solid waste combustion sources.

Since 1993, POTWs that practice incineration have been subject to a comprehensive, risk-based program for reducing the potential environmental risks of sewage sludge pursuant to CWA § 405 and the implementing regulations set forth Part 503. Section 405(d) of the Clean Water Act requires EPA to establish numeric limits and management practices that protect public health and the environment from the adverse effects of toxic pollutants in biosolids. Section 405(e) of the Clean Water Act prohibits any person from disposing of sewage sludge from a POTW or other treatment works treating domestic sewage through any use or disposal practice for which regulations have been established pursuant to § 405, except in compliance with the Part 503 regulations.

In Part 503 regulations, EPA has identified the pollutants in sewage sludge that may adversely affect public health or the environment and has specified the management practices for the utilization and disposal of sewage sludge that are protective of public health and the environment. For disposal by incineration, the Part 503 regulations require, among other requirements:

- (i) numerous management practices and general requirements;
- (ii) risk-based, site-specific limits for arsenic, cadmium, chromium, lead, and nickel content in the sewage sludge incinerated;
- (iii) compliance with National Standards for Hazardous Air Pollutants (NESHAPs) for mercury and beryllium (as discussed below);
- (iv) operational technology-based emission limits for total hydrocarbon (THC) or an alternative emission limit for carbon monoxide (CO); and
- (v) monitoring, recordkeeping and reporting requirements.

40 CFR Part 503, Subpart E.

Furthermore, in the course of developing the Part 503 regulations, EPA also proposed to establish requirements for dioxins (including specific congeners of dioxin, dibenzofuran, and coplanar PCBs).¹⁵ However, after evaluating the emissions from dioxins from sewage sludge incineration, as well as surface disposal and land application, EPA decided such requirements were not warranted.¹⁶ This decision was based on the results of a comprehensive risk assessment that demonstrated that dioxin levels in biosolids and biosolids incinerator exhaust gases do not pose a significant risk to human health or the environment.¹⁷

As explained in detail in NACWA's 1997 comments to EPA (pages 15-17), the numeric emission limits and management practices requirements established under the Part 503 regulations were derived from years of study and evaluation of the potential risks to human health and the environment which could be posed by the incineration of biosolids. The regulation of SSIs under this existing regime are risk-based standards that were developed to protect human health and the environment from any reasonably anticipated adverse effects from pollutants that may be present in sewage sludge. In fact, the Part 503 regulations for SSIs were developed through a partnership between EPA's water and air offices – a partnership that continues today as EPA conducts its mandated review of the Part 503 standards. As a result, SSIs can clearly demonstrate that the emissions from their units are *not* adversely impacting human health and the environment by demonstrating compliance with the Part 503 requirements. Moreover, the statutory framework of this regime provides for ample means for EPA to identify and regulate additional concerns if supported by scientific evidence. For example, CWA § 405 provides for a biennial review process that was specifically established for identifying and regulating any additional pollutants of concern. EPA has repeatedly emphasized its confidence that the Part 503 regulations are adequately protective of public health and the environment.¹⁸

Additionally, since 1975, EPA has imposed NESHAPs for mercury and beryllium emissions which apply to certain SSIs. *See* 40 CFR Part 61, Subpart E and C. The mercury NESHAP applies, in relevant part, to any source that incinerates wastewater treatment plant sludge and imposes emission limits for mercury, as well as imposes stack testing, sampling, and monitoring requirements. *See* 40 CFR Part 61, Subpart E. The beryllium NESHAP applies, in relevant part, to incinerators which process beryllium-containing waste and imposes emission limits for beryllium, as well as sampling requirements. *See* 40 CFR Part 61, Subpart C. These NESHAPs are expressly incorporated into the 40 CFR Part 503 requirements for POTWs.

Since 1974, EPA has also imposed New Source Performance Standards (NSPS) for SSIs under CAA § 111. *See* 40 CFR Part 60, Subpart O. These regulations apply to any incinerator constructed or modified after June 11, 1973 that (1) combusts wastes containing more than 10% sludge (dry basis) produced by municipal sewage treatment plants; or (2) charges more than 1,000 kg (2,205 lbs.) per day municipal sewage sludge (dry basis). *See* 40 CFR § 160.150. Under the existing NSPS for SSIs, regulated incinerators must comply with emission limits for particulate matter and opacity, as well as operational, monitoring, testing and reporting requirements.

Thus, of the eleven pollutants identified in CAA § 129, many are already directly regulated under EPA regulations at Parts 503, 60, or 61, including total particulate matter, opacity, lead, cadmium, mercury, and CO

¹⁵ *See Standards for the Use or Disposal of Sewage Sludge: Proposed Rule*, 64 Fed. Reg. 72,045 (Dec. 23, 1999).

¹⁶ *See Standards for the Use or Disposal of Sewage Sludge: Final Notice*, 66 Fed. Reg. 66,028 (Dec. 21, 2001).

¹⁷ *See id.*

¹⁸ *See* Letter from James A. Hanlon, Director of EPA Office of Wastewater Management, to Greg Kester, State of Wisconsin Department of Environmental Resources (Sept. 20, 2004) ("EPA believes that 40 CFR Part [503] regulations are protective of public health and the environment and we continue to support biosolids management in full compliance with the Part 503 regulation.") (attached hereto at Attachment C).

(optional, as a surrogate for THC). CAA § 129(a)(4); 40 CFR Parts 60, 61, 503. Additionally, EPA and NACWA have both also determined that SSIs are only very minor sources of several other of the CAA § 129 pollutants, including dioxins, sulfur dioxide, and hydrogen chloride. NACWA's March 17, 1997 comment letter (pages 13-14) documents in detail many specific examples of existing SSI regulations, or information regarding emissions from SSIs, for each of the pollutants listed in § 129.

In addition to the federal requirements applicable to SSIs outlined above, public agencies operating SSIs are also required to obtain a Title V operating permit if they are "major sources" as defined by the CAA. Pursuant to 40 CFR Part 403, POTWs additionally implement, through local regulatory authority, pretreatment standards to prevent discharge of pollutants to the POTW that may pass through or interfere with treatment processes. Pretreatment is an effective way to reduce harmful constituents in the sewage sludge combusted by SSIs. States also have authority to regulate and, in fact, do regulate air emissions from SSIs under their respective CAA State Implementation Plans. Together, these federal, state, and local regulations form an existing and effective regulatory scheme for regulating emissions from SSIs. Further regulation of SSIs under § 129 is not appropriate or necessary for the protection of public health and the environment.

EPA appears to have agreed with this analysis¹⁹ and nothing in the *NRDC* decision undermines this result.

F. Regulation of SSIs under CAA § 129 Would Result in Prohibitive Costs and Only Negligible Beneficial Impacts.

Congress' decision not to include SSIs among the categories of combustion sources covered by CAA § 129, and EPA's longstanding recognition of this exclusion, is also supported by an analysis of costs and benefits. The additional regulatory burdens imposed under CAA § 129 would be substantial to SSI operators, while offering no discernable corresponding benefits. The added costs then imposed upon POTW ratepayers would be considerable, and could potentially lead to the elimination of incineration as a biosolids management option for many communities.

Costs would invariably increase under CAA § 129 as SSI operators face competing MACT standards for pollutants that cannot be simultaneously achieved (e.g., NO_x and CO). For further discussion *see* NACWA's 1997 comment letter (pages 17-19).

An overwhelming cost or regulatory burden on SSIs would be inconsistent with EPA's declarations that incineration is a safe and acceptable sewage sludge disposal method. It would also be contrary to the congressional intent expressed in CWA § 405, in which Congress mandates that EPA must provide for safe management practices for the use and disposal of biosolids, and not to dictate "preferred" practices and eliminate others. For example, CWA § 405(e) states that "[t]he determination of the manner of disposal or use of sludge is a local determination," as long as the practice is in accordance with EPA's regulations.

¹⁹ 72 Fed. Reg. 2620, 2620-2624 (Jan. 22, 2007) (evaluating CAA § 129, its legislative history, and policy considerations to determine that (1) "EPA has the discretion to define which categories of combustion units should be subject to regulation under CAA § 129" and that SSI would be regulated under CAA § 112); 72 Fed. Reg. at 2627 (acknowledging that "various CWA and CAA regulations currently apply to SSI" and that "[t]hese other regulations provide some additional support for our decision not to regulate under CAA § 129 because these other regulations provide protection of human health and the environment for many of the pollutants regulated by CAA § 129 regulations").

For all of these reasons, NACWA believes that EPA has properly interpreted CAA §§ 112 and 129 to conclude that § 112, not § 129, applies to POTWs and SSIs. This determination under the CAA is fully consistent with the CWA and RCRA authorities and requirements discussed herein. As such, it is unnecessary, and would be very problematic as described herein, for EPA to develop a definition of solid waste for the purposes of CAA § 129 that inadvertently eviscerates longstanding and well-understood programs for sewage sludge management developed over many years under the CWA and RCRA.

I look forward to discussing this matter with you and your staff. Please contact me at 202-833-4653 or Chris Hornback of my staff at chornback@nacwa.org should you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "K Kirk". The "K" is large and stylized, followed by "Kirk" in a cursive script.

Ken Kirk
Executive Director



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November 17, 2009

Peter Tsirigotis

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Via e-mail: tsirigotis.peter@epa.gov

Dear Mr. Tsirigotis:

The National Association of Clean Water Agencies (NACWA) would like to express its concerns over the recent Information Collection Request (ICR) your office sent to nine municipal wastewater treatment agencies across the country, pursuant to authority under Section 114 of the Clean Air Act (CAA), as Office of Air personnel work to develop potential emissions standards for sewage sludge incinerators (SSIs) under Section 129 of the CAA. Most of the nine agencies selected for this data collection effort are NACWA members and we have serious concerns about the February 17, 2010, deadline for data collection and the representativeness of a national emissions program that would be based on air emissions data from only a handful of incinerators.

NACWA and its members are committed to protecting human health and the environment and are willing and interested in participating in any data collection effort that is done in a reasonable manner and that will lead to robust and valid emissions standards where necessary to protect human health and the environment. Unfortunately, the timeframe mandated in the ICR for the comprehensive testing you are requiring and the reliance on data from less than ten percent of the more than 230 SSIs across the U.S., raise major concerns.

NACWA understands that EPA is under pressure to meet a list of court-ordered deadlines for its air regulations. However, this does not mean that all of these wastewater treatment agencies will be able to expedite the scheduling of testing or dispense with time-consuming bidding processes that are mandated by local or state law. Much of the background information that is being requested can be compiled in a timely and straightforward manner. However, the emissions testing, for all of the agencies and a majority of the air emission parameters, will require the initiation of new air emission tests – recent existing data will not be available. Some of these

agencies will be required by utility-specific or state rules to conduct a public bidding process for the testing and analytical work. This will take months to complete and will make meeting the February 17 deadline difficult, if not impossible.

With the winter months upon us and the cold temperatures expected in many of the cities where testing is being required, scheduling will become even more difficult. NACWA is requesting that EPA provide the nine wastewater treatment agencies selected for participation in the ICR with additional time to conduct the necessary testing. We would like to discuss with you the timeframe we feel would be reasonable.

NACWA also believes that the validity of the development process for the potential MACT emissions standards is being undermined by the Agency's efforts to meet a court-ordered deadline. Nine facilities, though encompassing 20 SSIs, cannot be representative of the more than 230 SSIs in the country. By selecting only nine facilities to receive the ICR, EPA has avoided the review of the White House's Office of Management and Budget, which is required of all ICRs of a certain size. This certainly will save EPA months of review time and discussion with OMB, but unfairly burdens these nine utilities with the cost of testing and providing EPA with data without the certainty that the standards are being developed in a reasonable and valid manner. Developing a data collection plan to accommodate a schedule rather than ensuring that the data collected will be truly representative and result in environmentally protective standards falls well short of EPA's goal of basing policy on valid science.

NACWA and its members understand that EPA needs this new information to update the data it currently has on SSI emissions that are now a decade or more old. Any attempt to develop the Section 129 standards based on this out-dated information would be an even worse alternative to the current ICR effort. Developing Section 129 standards based on decades-old data or data from only a very small subset of the SSI community will only expose the Agency to additional legal challenges. NACWA believes that EPA must let only the science, not the schedule, drive its efforts to develop potential Section 129 standards for SSIs.

NACWA suggests that a conference call with the nine utilities involved with the ICR, NACWA personnel, and your staff to discuss how best to proceed. Please contact me at chornback@nacwa.org or 202/833-9106 to arrange a call, or with any questions about NACWA's comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris Hornback", written in a cursive style.

Chris Hornback
Senior Director, Regulatory Affairs

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August 3, 2010

Proposed Rulemaking–Identification of Non-Hazardous
Secondary Materials That Are Solid Waste
U.S. Environmental Protection Agency
Mailcode: 28221T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Attention: Docket ID No. EPA-HQ-RCRA-2008-0329

Dear Sir or Madam:

The National Association of Clean Water Agencies (NACWA) appreciates this opportunity to provide comments on the United States Environmental Protection Agency's ("EPA" or "the Agency") proposed rule titled "Identification of Non-Hazardous Secondary Materials That Are Solid Waste" (Proposed Rule). 75 Fed. Reg. 31844 (Jun. 4, 2010). NACWA represents the interests of nearly three hundred of the nation's publicly owned wastewater treatment utilities (POTWs), which collectively serve the majority of the sewered population in the United States. For forty years, NACWA has maintained a leadership role in legal and policy issues affecting clean water agencies, and has been at the forefront of the development and implementation of scientifically-based, technically-sound, and cost-effective environmental programs for protecting public and ecosystem health.

EPA's Proposed Rule, if finalized, will have an immediate and significant impact on the ability of many of NACWA's members to manage the thousands of tons of sewage sludge they generate on a daily basis. NACWA's members rely on having multiple options for the management of this sludge, but the list of available options has slowly shrunk over the years for many municipalities. EPA's proposed action will have a devastating impact on sewage sludge incineration – which is used to manage approximately a fifth of the sludge generated annually in the U.S. – and eviscerate progress toward a new, viable source of renewable energy for the country.

Accordingly, NACWA requests that EPA:

1. Exercise its discretion and exclude or exempt sewage sludge that is combusted from the final rule's definition of non-hazardous solid waste and preserve the current successful regulatory framework for sewage sludge and sewage sludge incinerators (SSIs) pursuant to the regulations contained within 40 C.F.R. Part 503 (Part 503).



2. Recognize that sewage sludge and scum (a.k.a. skimmings, the floatable materials removed during wastewater treatment) are legitimate fuels.
3. Classify the energy recovery and energy production devices employed by POTWs, both as elements of the incineration process and as stand-alone processes, as legitimate energy recovery systems.
4. Strengthen the language in the Proposed Rule to clearly indicate that its determination that sewage sludge is a non-hazardous solid waste does not apply to, and will not impact, other sewage sludge management options regulated under Part 503.

With these comments, NACWA urges EPA to adhere to Congress' clear intent to provide for the safe use and disposal of sewage sludge, to preserve local control over these management choices, to promote the beneficial use of sewage sludge, and to preserve incineration as a safe, viable, and cost-effective management practice for sewage sludge.

NACWA also requests that EPA decouple finalization of the Proposed Rule from the finalization of the proposed Commercial/Industrial Solid Waste Incinerators (CISWI) Definitions Rule, 75 Fed. Reg. 31938, and the proposed Boiler Maximum Achievable Control Technology (MACT) Rule, 75 Fed. Reg. 32005, both issued in the *Federal Register* on June 4, 2010. Finalization of the proposed rules in tandem is inappropriate as stakeholders must know what solid wastes are covered under the new rule before they can meaningfully comment on the solid waste incineration and boiler rules.

I. EPA Should Preserve the Current Successful Regulatory Framework for Burning Sewage Sludge Pursuant To Part 503

A. EPA Can Exclude or Exempt Sewage Sludge from the Proposed Rule

The Agency should provide a regulatory exclusion for sewage sludge burned in incinerators, which it sought comment on in the Proposed Rule. This will preserve the current framework for regulating sewage sludge under Part 503, which was developed under the authority of Clean Water Act (CWA) § 405 and the Resource Conservation and Recovery Act (RCRA).¹ EPA clearly has discretion to take such action, and has exercised it to create several other RCRA definitional exclusions. 40 C.F.R. § 261.4 (excluding materials from regulation as hazardous wastes).

EPA also has the discretion to exempt sewage sludge burned in incinerators. RCRA § 1006(b) requires EPA to integrate RCRA requirements with the requirements of the CWA and the Clean Air Act (CAA), as well as other laws. To prevent regulatory duplication, EPA has a non-discretionary duty to consider all environmental laws when promulgating regulations under RCRA. EPA has repeatedly exercised this discretion to ensure that waste management regimes created under other laws are not disrupted. For example, EPA exempted certain PBA-contaminated wastes from RCRA regulation because they are already managed under the Toxic Substances Control Act (TSCA). 40 C.F.R. § 261.8; 55 Fed. Reg. 11798, 11841 (Identification and Listing of Hazardous Waste) (March 29, 1990) (finding that “new regulation of these wastes under RCRA may be disruptive” and “does not appear to be necessary,” as “the regulation of these wastes under TSCA is adequate to protect human

¹ 75 Fed. Reg. 31866 (inviting comments on whether “it is within [EPA’s] discretion . . . to provide a regulatory solid waste exclusion for sewage sludge burned in incinerators that would preserve the current framework for regulating sewage sludge managed under section 405 of the CWA to avoid redundancy”).

health and the environment”). Similarly, EPA has exempted industrial ethyl alcohol from RCRA regulation because such regulation “was considered redundant” in light of comprehensive regulations already implemented by the Bureau of Alcohol, Tobacco and Firearms. 40 C.F.R. § 261.6(a)(3)(i); *see* 51 Fed. Reg. 28664, 28671 (Exports of Hazardous Waste) (August 8, 1986).

Both Congress and EPA gave comprehensive and careful thought to the proper regulation of the use and disposal of sewage sludge under the CWA, the CAA and RCRA. Deeming sewage sludge a solid waste when incinerated for promulgation of a rule under CAA § 129 violates EPA’s non-discretionary duty to harmonize environmental laws under RCRA because emissions from SSIs are already comprehensively regulated under other statutes. EPA has both the authority and the duty to maintain the comprehensive sewage sludge management programs already in place under these laws and, accordingly, must exclude or exempt sewage sludge that is combusted from the Proposed Rule.

B. EPA Should Exclude or Exempt Sewage Sludge from the Proposed Rule and Preserve the Current Successful Regulatory Structure for SSIs

Since the 1960s, federal regulation of publicly owned treatment works (POTWs) and sewage sludge has evolved under the CWA, the CAA, and RCRA, culminating in recent decades in a complete and comprehensive program that proactively regulates all facets of the use of sewage sludge. In particular, the Part 503 regulations and CAA § 112 form a cohesive, time-tested regulatory framework that provides for the safe use and disposal of sewage sludge, including incineration and other beneficial uses. America’s clean water agencies have invested heavily in and depend on this clear regulatory system.

1. Sewage Sludge Quality and Incineration Is Strictly Regulated under the CWA

Since 1993, POTWs that practice incineration have been subject to a comprehensive, risk-based program for reducing the potential environmental risks of sewage sludge pursuant to CWA § 405 and the implementing regulations set forth in Part 503. Section 405(d) of the CWA requires EPA to establish numeric limits and management practices that protect public health and the environment from the adverse effects of pollutants in sewage sludge. Section 405(e) of the CWA prohibits any person from disposing of sewage sludge from a POTW through any use or disposal practice for which regulations have been established pursuant to Section 405, except in compliance with the Part 503 regulations.

In the Part 503 regulations, EPA has specified the management practices for the utilization and disposal of sewage sludge that are protective of public health and the environment. As established by the risk assessment for Part 503, emissions from the incineration of sewage sludge are low and do not pose a risk to public health or the environment. 58 Fed. Reg. 9248, 9249 (Feb. 19, 1993) (Standards for the Use or Disposal of Sewage Sludge) (“even when sludge is incinerated and the population potentially exposed to the incinerator emissions is greater, the effects are small”). To ensure the safety of sewage sludge incineration, Part 503 requires risk-based limitations for arsenic, cadmium, chromium, lead, and nickel; compliance with the National Standards for Hazardous Air Pollutants (NESHAPs) for mercury and beryllium; operational emission limits for total hydrocarbon (the surrogate for all potentially toxic organic compounds) or an alternative emission limit for carbon monoxide; and numerous other general management, monitoring, recordkeeping and reporting requirements. 40 C.F.R. Part 503, Subpart E.

The numeric emission limits and management practice requirements established under the Part 503 regulations are based on one of the Agency’s largest risk assessments that was conducted in the late 1980s and

early 1990s to protect human health and the environment from any reasonably anticipated adverse effects from pollutants that may be present in sewage sludge.² As a result, SSIs demonstrate that the emissions from their units are not adversely impacting human health and the environment by demonstrating compliance with the Part 503 requirements. Moreover, the Part 503 regulations are continually reviewed as EPA regularly identifies and performs risk assessments on newly identified pollutants. *See, e.g.*, 66 Fed. Reg. 66228 (Dec. 21, 2001) (evaluating dioxin levels in sewage sludge and determining that “no further regulation of sewage sludge that is placed in a surface disposal unit or incinerated in a SSI is needed to protect public health and the environment from any reasonably anticipated adverse effects of dioxins”); 68 Fed. Reg. 75531 (responding to the National Research Council’s recommendations based on its review under Section 405(d)(2)(C)).

Pursuant to 40 C.F.R. Part 403 (Part 403), POTWs additionally implement, through local regulatory authority, pretreatment standards to prevent discharge of pollutants to the POTW that may pass through or interfere with treatment processes. Pretreatment reduces harmful constituents in the sewage sludge combusted by incinerators. Pretreatment has dramatically reduced the contaminants in sewage sludge and accordingly emissions from SSIs have become cleaner. Comparison of the sewage sludge quality measured in the 1980s³ with the measurements in 2006-2007 Targeted National Sewage Sludge Survey shows a clear improvement in sewage sludge quality since Part 403 and 503 were implemented.⁴ Specifically, the Northeast Ohio Regional Sewer District (NEORSD), which serves the City of Cleveland and 61 suburban communities, has seen significant decreases in the concentrations of heavy metals in both its influent, attributable to the Part 403 regulations, and its effluent, attributable to both Part 403 and 503.⁵ Between 1980 and 2004, NEORSD has seen the concentration of lead in the influent reduced by 95% while the concentration of lead in the effluent was reduced by 100%.⁶

Given the reduction in metals entering wastewater treatment plants due to effective pre-treatment programs and the implementation of Part 503, there has been a significant reduction in air emissions from SSIs since the early 1970s. Many POTWs are able to lower emissions far below the site-specific metal concentration limits for burned sewage sludge calculated using the Part 503 risk-based formula because of improvements in scrubber devices and in operational techniques developed by POTWs to comply with the Part 503 limits including higher exhaust gas temperatures, lower burning zone temperatures, and higher pressure drops.

For example, at NEORSD’s Southerly and Westerly wastewater treatment plants (Plants), emissions are only a fraction the of the Plants’ Part 503 regulatory limits for actual maximum metal and total hydrocarbon:⁷

² EPA, *A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule* (1995), at 107 (“[T]he risk assessments quantitatively identified allowable concentrations or application rates of pollutants in biosolids that are used or disposed that protect human health and the environment from reasonably anticipated adverse effects.”).

³ *See* EPA, *40 City Study* (1982); EPA, *National Sewage Sludge Survey* (1988).

⁴ *See infra* at Section II(c)(2)(b).

⁵ *See* Lita Laven, Frank Foley and Robert Dominak, *Improvements in Biosolids Quality Due to EPA’s Pretreatment and Biosolids Programs*, Residuals and Biosolids Management Conference 2006, at 142-147 [Attachment 1].

⁶ *Id.* at 147, Table 1.

⁷ Southerly and Westerly Plants’ Part 503 Reports for 2009 provide additional details.

	Highest Actual Emissions as a Percentage of Regulatory Limit	
	Southerly 2009	Westerly 2009
Arsenic	1%	3%
Cadmium	4%	3%
Chromium	1%	1%
Lead	1%	7%
Nickel	0.02%	0.03%
Total Hydrocarbon	27%	6%

The Plants' beryllium and mercury emissions, as tested in 1993 and 1995 are also a fraction of the NESHAPS limits:

	Highest Actual Emissions as a Percentage of Regulatory Limit	
	Southerly	Westerly
Beryllium	1%	0.4%
Mercury	4%	2%

The NEORSD Plants are not unique in their performance and use widely adopted technologies and operational standards. The dramatic decrease in metal concentrations in sewage sludge and the low metal and total hydrocarbon emission levels demonstrate that the CWA's regulation of sewage sludge from pretreatment to incineration is both exhaustive and protective of human health and the environment.

2. Current Clean Air Act Regulation of Incineration of Sewage Sludge Is Effective and Should Not Be Abrogated

Further reason for EPA to promulgate an exclusion or an exemption to the new solid waste definition that preserves the current regulatory regime for sewage sludge is that Congress wrote CAA § 112 to directly regulate sewage sludge emissions. Section 112(e)(5), promulgated in the 1990 CAA amendments, requires EPA to establish emission standards for hazardous air pollutants (HAPs) for POTWs. In particular, CAA § 112(e)(5) states:

The Administrator shall promulgate standards pursuant to subsection (d) of this section applicable to publicly owned treatments works (as defined in Title II of the Federal Water Pollution Control Act [33 U.S.C.A. § 1281 et seq.]) not later than 5 years after November 15, 1990.

42 U.S.C. § 7412(e)(5). Congress' express inclusion of POTWs, including SSIs, under CAA § 112 demonstrates express intent to regulate air emissions from SSIs under the CAA's § 112 framework. EPA should implement this Congressional intent through an exclusion or exemption or under the rule.

EPA has already regulated the incineration of sewage sludge as intended under CAA § 112, by identifying SSIs as an area source category under CAA § 112. In 2002, EPA determined that the SSI category does not have any sources with the potential to emit HAPs at a level approaching major source levels,⁸ and included SSIs as an

⁸ See *National Emission Standards for Hazardous Air Pollutants: Revisions of Source Category List under Section 112 of the Clean Air Act*, 67 Fed. Reg. 6521 (Feb. 12, 2002).

additional area source category under CAA §§ 112(c)(3) and 112(k)(3)(B)(ii).⁹ EPA implemented these CAA § 112 requirements as Congress intended. The fact that EPA determined there was no basis under CAA § 112 to issue substantive air emission requirements for SSIs, because they all were area sources, is simply a recognition that the burning of sewage sludge did not trigger such regulation under the requirements established by Congress.

Moreover, since 1974, EPA has also imposed New Source Performance Standards (NSPS) for SSIs under CAA § 111. *See* 40 C.F.R. Part 60, Subpart O. Under the existing NSPS for SSIs, regulated incinerators must comply with emission limits for particulate matter and opacity, as well as operational, monitoring, testing and reporting requirements. In addition to the federal requirements applicable to SSIs outlined above, public agencies operating SSIs are also required to obtain a Title V operating permit if they are “major sources” as defined by the CAA. States also have authority to regulate and, in fact, do regulate air emissions from SSIs under their respective CAA State Implementation Plans.

Together, the CWA, CAA § 111 and CAA § 112 SSI emission regulations have protected human health and the environment for over twenty years. Defining sewage sludge that is combusted as a solid waste will result in the regulation of many SSIs under CAA § 129, which is contrary to Congressional mandate, is not appropriate or necessary for the protection of human health and the environment, and will impose huge costs on municipal agencies that are struggling to meet other environmental mandates.

C. Supplanting Part 503 with a New Regulatory Regime Will Disrupt America’s Sewage Sludge Infrastructure with No Significant Improvements to Public Health

EPA correctly recognized that the Proposed Rule will impose indirect costs through the Boiler MACT and CISWI proposed rules, which will, as currently proposed, compel regulation of SSIs under CAA § 129.¹⁰ The costs imposed will be huge and are not tied to clear environmental benefits or public health benefits for residents near SSIs. NACWA estimates total capital costs associated with SSI MACT standards imposed as a direct result of the Proposed Rule would be in excess of \$3 billion, along with a substantial increase in operating expenses. There is no pressing public health rationale for saddling public agencies that incinerate with enormous new costs for upgrades and/or alternative management of sewage sludge. Moreover, while EPA assumes a certain public health benefit from a move away from incineration, the reality is that some of the other management options required if incineration is no longer a viable option may actually result in substantially higher emissions than incineration.

NACWA estimates that 17%-22% of all sewage sludge generated in the U.S. is incinerated, which could be in the range of 4 to 6 million wet tons per year. Incineration results in complete destruction of all pathogens, emerging contaminants, pharmaceuticals and many other undesirable trace constituents of sewage sludge. Upgrades for compliance with CAA § 129 to incinerators that already safely and efficiently process nearly a quarter of the nation’s sewage sludge will be cost-prohibitive for many POTWs. Each incinerator would need to be outfitted with numerous different technologies to comply with the MACT standards.¹¹ Roughly dividing the

⁹ *See National Emission Standards for Hazardous Air Pollutants: Revisions of Area Source Category List under Sections 112(c)(3) and 112(k)(3)(B)(ii) of the Clean Air Act*, 67 Fed. Reg. 43,112 (June 26, 2002).

¹⁰ 75 Fed. Reg. 31889 (analyzing the costs under the Boiler MACT and CISWI proposed rules).

¹¹ The necessary systems may include advanced scrubbing systems and/or wet electrostatic precipitators for reducing particulate matter and particulate-based metal emissions, the addition of sodium hydroxide and/or ammonia for reducing emissions of sulfur dioxide and
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estimated costs among the 230 operative POTW incinerators, upgrades to each incinerator unit could cost over \$13 million. POTWs operate on budgets that cannot accommodate tens of millions of dollars in additional capital costs and sizable increase in operating costs – with no appreciable environmental gain – particularly at a time of great economic distress coupled with the struggle of meeting other major regulatory obligations, including sewer overflow controls and nutrient reductions.

For POTWs that cannot upgrade because of a lack of space or an inability to fund upgrades, the alternative management options are problematic. Land applying or landfilling sewage sludge are more expensive than incineration in the long term and provide no benefits such as energy recovery, decreased transportation costs, and decreased transportation emissions. For POTWs that currently incinerate all of their sewage sludge, significant resources would be necessary just to develop the loading, storage, and stabilization infrastructure required for land applying or landfilling. One wastewater treatment agency estimates that it will cost \$9 million just to develop such infrastructure. Even where the infrastructure is already in place, the cost necessary to land apply or landfill more or all of a facility's sewage sludge is prohibitive.

The following are a few telling examples of the costs of incineration versus landfilling sewage sludge:

- An agency in Minnesota estimates that the operations and maintenance (O&M) costs associated with incineration of sewage sludge are \$200.00 per dry ton, including thickening. Because landfilled sewage sludge in Minnesota, like certain other states, must meet the Part 503 Class B pathogen reduction standards, the cost of landfilling is much higher. Minn. R. 7035.2535, Subp. 1, Item B. The estimated O&M costs necessary to prepare sewage sludge for landfill (i.e. alkaline stabilization) are \$300.00 per dry ton, including thickening and landfill disposal fees (\$100.00 per dry ton more expensive than incineration).
- In North Carolina, one agency estimates that incineration costs \$22 per wet ton, while landfilling costs \$95 per wet ton (\$73.00 per dry ton more expensive than incineration).
- In Ohio, it was reported that the current cost for incineration is \$157 per dry ton, while landfilling costs \$312 per dry ton (\$155.00 per dry ton more expensive than incineration).
- At the NEORSD's Southerly Plant, it costs over twice as much to landfill or land apply sewage sludge than to incinerate it. Moreover, land filling unit cost will substantially increase if incineration is no longer a viable option, and there are concerns about the remaining service life of the landfills in the area.
- According to an EPA report, one California POTW "indicated that the cost of incinerating its waste treatment sludge is, on an annual basis, \$4.3 million less than the cost of landfilling this material."¹²

In addition, some states have limits on how much sewage sludge can be landfilled or eliminate in-state landfilling as a management option.¹³ Increased reliance on landfills and limits to landfill use will force

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oxides of nitrogen, activated carbon absorbing systems and/or activated carbon injection system for reducing mercury emissions, and internal or external afterburners for reducing carbon monoxide emissions.

¹² EPA, *Materials Characterization Paper on Wastewater Treatment Plants*, March 18, 2010, p. 7.

facilities to truck sewage sludge to increasingly distant landfills resulting in higher transportation costs, including fuel costs.

Further increasing the burden on POTWs is the expectation that the cost differential between incineration and other management options will increase significantly in the coming years. NEORSR estimates that in 2013, the cost of incineration will be \$4 less than it is today while the cost of landfilling will increase by \$21 (per wet ton). Speaking in broad terms, in 2013 it will cost the facility \$9 million per year more to landfill its sewage sludge than to incinerate it. Moreover, it will cost \$10 to \$11 million per year more for land application than incineration. This would substantially impact the NEORSR's current O&M budget of \$40 to \$45 million per year.

Particularly for the numerous large cities that rely on incineration, landfilling and land application will always be more expensive alternatives. The significant costs to POTWs will be passed on to the rate payers. In the immediate future, rates are expected to increase dramatically even without the implementation of the Proposed Rule because of the well-documented funding challenges facing POTWs as they expand infrastructure and meet EPA mandates for prevention of overflows and nutrient loading. NEORSR estimates that its rates will double within six years due to the implementation of a \$3 billion combined sewer overflow control program and currently required improvements at its three treatment plants.

In addition to increased costs, land application and landfilling may actually result in higher emissions than those produced during incineration because of the distances sewage sludge must be transported. Through a detailed analysis of priority pollutant emissions associated with incineration, landfilling and land application, NEORSR and its consultants found that emissions of carbon monoxide, nitrogen oxide, and organics from three new fluidized bed incinerators being constructed at the Southerly Plant will be lower or equal to the emission levels from land application and landfilling, as follows:

Pollutant	Three Fluidized Bed Incinerators Total Emissions	Trucks Emissions Landfills (round-trip)	Trucks Emissions Land Application Sites (round-trip)*
Carbon Monoxide	3	4	7
Oxides of Nitrogen	44	46	71
Sulfur Dioxide	6	4	6
Organic Compounds	1	3	4

The calculated emissions above include only the projected air emissions from the three new fluidized bed incinerators and the trucks that would be used to transport the sewage sludge from the Southerly Plant to landfills or land application sites. It does not include any additional emissions once the sewage sludge reaches the landfill or land application site. In addition, since the Southerly Plant does not have digesters, nor the room to construct them, the only way to produce a land applicable product is through alkaline stabilization, which will increase emissions even further due to the emissions associated with the trucking of the lime from the quarry to the plant.

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¹³ See State of Connecticut Solid Waste Management Plan at 4-64 ("Sewage sludge, which is generated by the 111 wastewater treatment plants located in Connecticut, is managed in three ways: shipped out-of-state for management, composted at one of two composting sites in-state, or sent to one of the six sewage sludge incinerators located within Connecticut.").

By forcing a switch to landfilling, the Proposed Rule also negatively affects the environment by placing recyclables in landfills, which will significantly impact landfill capacity/life. Organizations including the National League of Cities, U.S. Conference of Mayors, and the Association of State and Territorial Solid Waste Management Officials have already expressed concerns to EPA regarding the Agency's presumption that many SSIs will be abandoned in favor of landfilling and the associated cost assumptions in the context of the proposed SSI MACT standards. In preliminary discussions over the proposed standards, EPA confirmed that it has not factored dwindling landfill capacity and the significant cost to construct new landfills into its economic analysis on the MACT standard proposal.

Incineration may also be the best management option for minimizing greenhouse gas emissions. Faced with potential regulatory changes and potential increases in all of its wastewater residuals management costs, in 2008 the NEORSR asked a Blue-Ribbon Panel (Panel) of seven internationally renowned sewage sludge management professionals to evaluate sewage sludge management alternatives.¹⁴ The Panel determined that the installation of new fluidized bed incinerators at the Southerly Plant was the most viable, cost-effective and environmentally friendly option for sewage sludge management.

The following is a summary of the Panel's greenhouse gas emissions analyses:

Sewage Sludge Processing	Greenhouse Gas Emissions (Metric Tons CO₂-equivalent/year)
Fluidized Bed Incineration with Energy Recovery and Electricity Production	-10,500*
Fluidized Bed Incineration without Energy Recovery	5,700
Landfilling (transport fuel + decay)	25,000

* Includes reduced emissions from purchased power (i.e., reduced power plant emissions).

The Panel also noted that greenhouse gas emissions associated with land application would likely be higher than incineration for NEORSR, but did not have time to conduct the analysis. While the emissions reported above are specifically for the Southerly Plant, conversion from incineration to landfilling or land application will also result in an increase in greenhouse gas emissions for numerous other POTWs.

Ultimately, the elimination of incineration as a viable, cost-effective and environmentally friendly sewage sludge management option will result in substantial increases in capital expenditures, operating and maintenance costs, emissions of priority pollutants and/or emissions of greenhouse gases for many POTWs.

II. Sewage Sludge Is a Legitimate Fuel and Not a Solid Waste

Pursuant to RCRA, and the preamble to the Proposed Rule, legitimate use and recycling are critical factors in determining whether a material is not "discarded" and therefore is not a solid waste. 75 Fed. Reg. 31844, 31851. If EPA does not grant an exclusion or exemption for sewage sludge, it should determine based on the data provided in these comments that sewage sludge is a legitimate fuel and that it is being recycled for beneficial uses.

¹⁴ Residuals Management Validation Panel, *Summary of Findings and Recommendations* (Aug. 29, 2008) [Attachment 3].

A. Sewage Sludge Incineration Is a Valuable Energy Recovery Source

Sewage sludge and scum incineration for energy recovery embodies the concept of legitimate use and recycling and the proposed Rule did not address these important RCRA concepts. Sewage sludge is an organic, renewable resource with the potential to become an important component of the country's renewable energy portfolio. Sewage sludge contains approximately 8,000 Btu/lb on a dry basis (2,000 Btu/lb on an as received basis assuming 25% solids) and can generate 2.3 kWh/lb.¹⁵ In reliance on the current Part 503 regulatory structure, significant technological innovation is underway involving energy production from the combustion of sewage sludge, both as a component of the incineration process and through stand-alone combustion processes. The Proposed Rule would halt the advancement of these technologies as they come under the onerous requirements of CAA § 129 and undermine Congressional directives to limit greenhouse gas emissions.¹⁶ In addition, implementation of the Proposed Rule could disrupt carefully crafted state regulatory schemes that encourage beneficial use.¹⁷

Sewage sludge can provide significant amounts of power for facility operations and for the nation's energy grid. At one facility, for example, heat from the incineration of sewage sludge is converted into high pressure steam, in boilers, that powers a steam turbine generator producing over 5 megawatts of electricity. While the potential for energy production is high, POTWs need support from EPA to promote the use of this sustainable and renewable energy resource.¹⁸ Not only does the Proposed Rule fail to promote the use of alternative fuels, but the Proposed Rule serves as a major disincentive for many current and developing energy recovery projects. In addition to the loss of the beneficial use from these projects, there will also be an addition of fuel use and costs to replace recovered energy.

Many facilities are currently maximizing sewage sludge utilization while minimizing fossil fuel use:

- A sanitary district in California reports that incineration of wastewater treatment sludge saves the district \$320,000 per year in energy costs by avoiding natural gas costs.¹⁹
- The NEORSD's Southerly Plant reports that it saves \$600,000 to \$700,000 per year in natural gas costs by operating waste heat boilers. In October 2000, U.S. EPA presented the NEORSD with a special beneficial use of sewage sludge award for energy conservation due to the use of a waste heat recovery system during incineration of sewage sludge at the Southerly Plant.

The efforts of these agencies to beneficially use sewage sludge may no longer be viable if the Proposed Rule is implemented. Furthermore, agencies in the process of constructing infrastructure to maximize sewage sludge energy recover may find their investments negated by the Proposed Rule:

¹⁵ See NACWA, *Renewable Energy Resources: Banking on Biosolids* (2010) at p. 3 [Attachment 2].

¹⁶ See, e.g., Energy Independence and Security Act (EISA), 42 U.S.C § 17001 et seq. (2007).

¹⁷ Some states currently exempt from solid waste regulations incinerators or energy recovery facilities that incinerate wastes generated by the facility that owns the incinerator or energy recovery facility. See, e.g., Ohio Administrative Code 3745-27-03(A)(5). The Proposed Rule opens the door for revocation of these exemptions and the potential for states to impose additional solid waste regulations on SSIs.

¹⁸ See NACWA, *Renewable Energy Resources* (detailing sewage sludge energy products, technologies, and barriers to widespread adoption of these technologies).

¹⁹ EPA, *Materials Characterization Paper on Wastewater Treatment Plants*, March 18, 2010, p. 7.

- NEORSD is in the process of constructing a new Renewable Energy Facility at its Southerly Plant that will include three new waste heat boilers and a steam turbine generator in conjunction with three new fluidized bed incinerators. The cost to purchase and install this equipment and to construct the steam turbine generator building was \$22 million with payback expected in 11 years. High pressure steam produced by new waste heat boilers will power a steam turbine generator that produces electricity, which will be used to run the incinerators and ancillary equipment. The steam turbine generator will produce 2.6 megawatts, while the plant's electrical demand is 13 megawatts. During the first year of operations, the cost savings associated with the steam turbine generator will be \$1.5 million, while greenhouse gas emissions associated with the reduced electrical power demands will be 16,000 metric tons CO₂e.

The Proposed Rule could dramatically impact the Southerly Plant's \$149 million Renewable Energy Facility. First, because there is only a limited amount of space around the new building, there may not be enough room to install all of the additional equipment that may be necessary to meet the final MACT Standards. Second, depending on the final MACT Standards, the layout of the equipment in the new building may need to be altered to facilitate compliance. Third, if for some reason the new MACT Standards are unachievable, the NEORSD's only viable management option would be landfilling. The cost to construct new sludge storage and truck loading facilities to fill 10,500 trucks per year could be in excess of \$50 million. In addition, hauling costs and tipping fees would be approximately \$18 million per year, far more than it costs to use the sewage sludge for energy recovery.

In sum, implementation of the Proposed Rule could eliminate energy recovery options for POTWs, create disincentives for POTWs to use energy recovery in the future, increase POTW dependence on fossil fuels, and increase reliance on less beneficial uses for sewage sludge management.

B. Sewage Sludge Incinerated for Energy Recovery Is Not Discarded

As described in detail above, incineration of sewage sludge is an important source of energy and plainly meets the flexible criteria courts have established for when a waste is not "discarded" and, therefore, not a solid waste. When this process is compared to the dictionary definition of "discard," it is clear that sewage sludge incinerated for energy recovery is not discarded because it is not cast aside, rejected, abandoned or given up.²⁰ In addition, this sewage sludge is beneficially reused in a continuous process of water treatment by the water treatment industry, *American Mining Congress v. EPA*, 824 F.2d 1177, 1186 (D.C. Cir. 1987); the sewage sludge is beneficially used shortly after its production and it is not stored for potential reuse, *American Mining Congress v. EPA*, 907 F.2d 1179, 1186 (D.C. Cir. 1990); and, the sewage sludge is being used by its producers, and not by a reclaimer, *United States v. ILCO*, 996 F.2d 1126, 1131 (11th Cir. 1993).²¹ Sewage sludge, a largely organic fuel that satisfies EPA's standards for a valuable product, is a legitimate fuel rather than a discarded waste.

²⁰ *Safe Air For Everyone v. Waynemeyer (Safe Air)*, 373 F.3d 1035, 1041 (9th Cir. 2004) citing *The New Shorter Oxford English Dictionary* 684 (4th ed. 1993).

²¹ Through assessment of the definition of "discard" and the above test derived from relevant rulings of the circuit courts, the Ninth Circuit recently held that Kentucky bluegrass residuals are not solid wastes when they are burned in the fields as part of the continuing growing process. *Safe Air*, 373 F.3d 1035. Sewage sludge incineration for energy recovery is analogous to the burning of Kentucky bluegrass because the heat created is used to power onsite sewage management operations.

C. Sewage Sludge Is a Legitimate Fuel

EPA has long-recognized that under RCRA a fuel is not discarded and is not a solid waste. EPA's legitimacy criteria for qualification of a waste as a fuel are easily satisfied by sewage sludge and scum. NACWA in these comments is providing data and context to demonstrate that sewage sludge indeed meets the legitimacy criteria and its combustion, via incineration or some other process, for energy recovery is legitimate reuse and recycling.

1. Sewage Sludge Has a Meaningful Heating Value and Is Managed as a Valuable Commodity

EPA is proposing that non-hazardous secondary materials must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy to be considered legitimate fuels. Proposed Rule § 241.3(d)(1)(i). First as previously discussed, sewage sludge has a heating value of approximately 2,000 Btu/lb as received. EPA's proposed minimum of 5,000 Btu/lb as received²² overlooks the significant energy recovery potential at lower levels of Btu/lb. Combustion of dewatered sewage sludge in an incinerator provides net energy that can reduce or eliminate fossil fuel usage within the incinerator unit and provide heat for energy recovery and/or energy production purposes. NACWA requests that EPA eliminate the arbitrary minimum heating value restriction to enable the significant heating value of sewage sludge to be captured and beneficially reused via incineration. Those sludges that are not incinerated and that are further dried and processed for burning in other combustion units would meet the proposed minimum Btu/lb criterion.

Second, EPA's determination that waste heat boilers do not qualify as "combustion unit[s] that recover[] energy" is arbitrary and does not recognize the significant value of waste heat boilers and their role in energy generation and beneficial use of sewage sludge. At the Southerly Plant, for example, four waste heat boilers have replaced the need for significant amounts of natural gas resulting in substantial reductions in air emissions and \$14 million in natural gas related cost saving over a 25 year period. Consistent with RCRA, this sewage sludge was burned to produce heat for boilers and is not discarded solid waste. EPA's reliance on the definition of energy recovery combustion units for hazardous waste management overlooks the fact that the Proposed Rule is focused on non-hazardous wastes, which can be burned with much less risk than hazardous wastes and can greatly reduce reliance on fossil fuels. Further, EPA's determination of what constitutes a legitimate fuel should not hinge on how the energy recovery is made. EPA's categorical exclusion of waste heat boilers as a legitimate energy recovery unit is too broad and must be eliminated or narrowed to ensure valuable renewable energy sources can remain in operation.

EPA is also proposing that non-hazardous secondary materials used as fuels be managed as valuable commodities. Proposed Rule § 241.3(d)(1)(i). NACWA believes sewage sludge meets this criterion based on a review of the factors listed in Section 241.3(d)(1)(i). Specifically, sewage sludge is not stored for unreasonable times. In fact, for most POTWs that practice incineration, there is no storage at all of the sewage sludge. Sludge is transferred directly to the SSI via pipe. An equalization tank may be used to dampen diurnal variation in sludge production, but there is no storage. Some agencies, including those that digest their sludge before incineration, may have storage capabilities, but SSIs are operated based on a constant, stable feed of sludge. Sludge handling and feed systems are managed as just another process stream in a steady-state wastewater treatment and incineration operation, with no storage required. Where storage is necessary for short periods, sewage sludge is adequately contained to prevent releases to the environment.

²² See 75 Fed. Reg. 31844, 31871.

2. The Proposed Contaminant Level Criterion Is Inadequate and EPA's Assessment of Sewage Sludge under this Criterion Is Flawed

In addition to meeting the heating value and management as a valuable commodity criteria, sewage sludge also meets the contaminant level criterion proposed by EPA. In the preamble to the Proposed Rule, however, EPA indicates that contaminant levels preclude sewage sludge from designation as a legitimate fuel. 75 Fed. Reg. 31844, 31867. NACWA's comments demonstrate that sewage sludge meets the contaminant level criterion as proposed and that EPA's determination that sewage sludge does not meet this criterion is based on outdated data. NACWA also believes that EPA's contaminant level criterion is too simplistic and excludes valuable, clean burning alternative materials from use as a legitimate fuel. Sewage sludge – a safe, organic fuel that has undergone a thorough risk assessment with its few contaminants currently regulated and evaluated – is a legitimate fuel.

(a) The Proposed Contaminant Level Criterion Is Inadequate

EPA is proposing a legitimacy criterion under which non-hazardous secondary materials used as fuels in combustion units must contain contaminants at levels that are comparable to those in traditional fuel products. Proposed Rule § 241.3(d)(1)(iii). According to the Agency, the contaminant level criterion “is necessary because non-hazardous secondary materials that contain contaminants that are not comparable in concentration to those contained in traditional fuel products or ingredients would *suggest* that these contaminants are being combusted as a means of discarding them.” 75 Fed. Reg. 31844, 31871-72 (emphasis added). The suggestion of an intent to discard is not sufficient to categorize an entire class of non-hazardous secondary material as a solid waste particularly when there is ample evidence that the material is used beneficially for energy recovery.

The application of this contaminant criterion to sewage sludge must also be reevaluated because the Proposed Rule is not predicated on any sewage sludge incinerator emissions data. If the burning of a non-hazardous secondary material replaces the use of a traditional fuel and has lower emissions than that traditional fuel, its use should be encouraged. EPA should assess the legitimacy of non-hazardous secondary materials as a fuel on the basis of emissions. The premise of EPA's Emission-Comparable Fuel Exclusion would work very well with non-hazardous secondary materials because EPA would not need to impose regulations that obliterate the usefulness of the exclusion. Because the materials dealt with here are non-hazardous, there would be none of the combustion and storage concerns that led to the recent withdrawal of the Emission-Comparable Fuel Exclusion Under RCRA for Hazardous Wastes.²³ It is only logical that a non-hazardous secondary material should be considered a legitimate fuel if emissions from an incinerator burning this material is comparable to the emissions from an industrial boiler burning traditional fuels.

(b) EPA's Assessment of Sewage Sludge under the Contaminant Level Criterion Is Flawed

²³ 75 Fed. Reg. 33712 (June 15, 2010) (Final Withdrawal); *see also* 74 Fed. Reg. 64643, 64647 (Dec. 8, 2009) (Proposed Withdrawal) (finding that the exclusions “require more resources and more attention from the regulatory agency than a subtitle C approach to reach a comparable level of assurance that appropriate combustion conditions are met” and that some hazardous wastes “pose a greater storage hazard than fuel oil”).

EPA's assessment of sewage sludge under the proposed contaminant criterion is based on outdated data and EPA must reevaluate its position in light of more recent data. EPA stated that it does not believe sewage sludge can meet the contaminant level criterion. 75 Fed. Reg. 31844, 31867 ("[M]unicipal sewage sludge contains metals that are typically higher in concentrations when compared to traditional fuels (e.g., coal and fuel oil) As such, the Agency does not believe that sewage sludge would meet the legitimacy criteria for contaminants."). EPA based this determination on one summary-level table, which contains sewage sludge contaminant levels from outdated sources.

EPA's flawed determination rests on the 1982 40 City Study and the 1988 National Sewage Sludge Survey (NSSS), not the much more recent 2006-2007 Targeted National Sewage Sludge Survey (TNSSS), which shows dramatically lower contaminant levels:

Element	40 City Study ²⁴ 1982	NSSS ²⁵ 1988	TNSSS ²⁶ 2006-2007	Coal ²⁷
	mg/dry kg			
Arsenic	9.9	6.7	6.9	10
Cadmium	69	6.9	2.6	0.5
Chromium	429	119	80	20
Lead	369	134.4	76	40
Mercury	2.8	5.2	1.2	0.1
Nickel	135.1	42.7	48	20
Selenium	7.3	5.2	7	1

Clearly, the older data do not reflect the significant advances in pretreatment, the decline of heavy polluting manufacturing processes, and the implementation of the Part 503 regulations in the mid-1990s, all of which make sewage sludge much cleaner for fuel purposes and protect public health. EPA's own documents acknowledge the significant reductions in pollutant loadings were made in the late 1980s and early 1990s – after the sewage sludge studies relied upon for the Proposed Rule were conducted.²⁸

EPA's flawed determination also overlooks the fact that sewage sludge quality is already heavily regulated by the CWA. The National Pretreatment Standards in Part 403 prevent the introduction of pollutants into POTWs and are meant to "improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges." 40 C.F.R. § 403.2. In addition, Part 503 regulations provide risk-based limits for incinerated sewage sludge contaminants and that the Agency has previously determined that when contaminant levels are below these limits, no significant public health or environmental risk exists.²⁹ Other non-hazardous secondary

²⁴ Cited by EPA at 75 Fed. Reg. 31867.

²⁵ *Id.*

²⁶ All values are based on the mean of aggregated samples from Appendix B-3 of the TNSSS Statistical Analysis Report available at <http://epa.gov/waterscience/biosolids/appendixb.pdf>.

²⁷ Cited by EPA at 75 Fed. Reg. 31867.

²⁸ OIG, *EPA Needs to Reinforce its National Pretreatment Program*, Report No. 2004-P-00030 (Sept. 28, 2004).

²⁹ 58 Fed. Reg. 9249 ("EPA is confident that the regulations it is promulgating today adequately protect public health and the environment from all reasonably anticipated adverse effects, as required by section 405(d), for several reasons" including that "even when sludge is incinerated and the population potentially exposed to the incinerator emissions is greater, the effects are small").

materials considered in the Proposed Rule do not have these highly researched and restrictive contaminant levels in place including the biomass group, construction and demolition materials, scrap tires, scrap plastics, spent solvents, coal refuse, and used oil. Through the Part 403 pretreatment program and the Part 503 regulations, sewage sludge contaminants are already managed to levels sufficient for sewage sludge to be classified as a legitimate fuel.

Further, when current sewage sludge contaminant level data is examined, there is no significant difference in the metal content of sewage sludge and traditional fuels. The coal contaminant values relied on by EPA do not demonstrate that coal contaminants are significantly lower than those in sewage sludge. In addition, the coal contaminant values, as presented by EPA, do not show the large range of contaminant levels in coal used for fuel. As stated in the Clarke and Sloss report from which the coal contaminant values were derived, “[t]race element concentrations vary enormously between coals from different sources, and even between coals from the same seams. The overall physical and chemical properties of a feed coal may be greatly altered by the mining, handling and cleaning processes prior to combustion or gasification.”³⁰ The “enormous” variability in coal contaminant values indicates that much of the coal combusted in the U.S. is likely to have one or more of the above contaminants at a higher concentration than the “typical” coal contaminant values EPA cites. When making its determination regarding contaminant levels, EPA also overlooked the variability in sewage sludge contaminant levels. Because contaminant concentrations vary from plant to plant due to differences in industrial loadings and background concentrations, it is inappropriate to categorize all sewage sludge based on mean contaminant values. Accordingly, EPA’s blanket determination that sewage sludge contains metals that are typically higher in concentration when compared to coal is flawed.

NACWA requests that EPA reevaluate the comparableness of sewage sludge to coal in light of the TNSSS survey. In addition, if necessary, EPA should consider a facility-by-facility determination of whether this criterion is met.

III. EPA Should Explicitly Limit the Scope of the Proposed Rule

NACWA and the regulated community are concerned that defining sewage sludge that is combusted as a solid waste in the Proposed Rule could have unintended effects on other forms of sewage sludge management, particularly at the state level. NACWA appreciates that EPA already has explicitly limited the purpose of the Proposed Rule to “identification of the requirements and procedures for the identification of solid wastes used as fuels or ingredients in combustion units under section 1004 of the Resource Conservation and Recovery Act and section 129 of the Clean Air Act.”³¹ While it appears to be EPA’s view that this Proposed Rule does not affect Part 503 and state analogs, there is, however, a potential that the Proposed Rule will affect the states’ ability to implement state biosolids management programs. There is also the potential that the Proposed Rule could lead to an unnecessary increase in lawsuits challenging other forms of sewage sludge management. Accordingly, if EPA decides not to exercise its discretion and exclude or exempt sewage sludge from its regulatory definition of non-hazardous solid waste for combustion, EPA must more explicitly state that the final rule has no regulatory effects or implications for sludge that is not incinerated.

Without clear and definitive limitations on the designation of sewage sludge as a solid waste for this rule only, state regulators may mistakenly modify or eliminate current exemptions that allow for beneficial use of

³⁰ Clarke, L.B. and Sloss, L.L., *Trace Elements-Emissions from Coal Combustion and Gasification*, International Energy Agency Report CR/49, London (1992), p. 26.

³¹ Proposed Rule § 241.1.

biosolids at the state level. Moreover, state regulators may react differently to implementation of the Proposed Rule because states allocate the responsibility for sewage sludge management to different divisions of each state's environmental agency. As of 2008, twenty-nine states regulate sewage sludge under the water program, eight states regulate sewage sludge under the solid waste program, and eight states regulate sewage sludge under both the water and solid waste programs.³²

States that exempt sewage sludge from regulation under their solid waste programs – relying expressly or implicitly on their understanding of a broad federal exemption – may face the most uncertainty.³³ Such states may be compelled to revoke the exemption and reclassify sewage sludge as solid wastes, which could significantly alter the state's sewage sludge management scheme. States that have created specific regulations for sewage sludge separate from the solid waste regulations may also face difficulties should the Proposed Rule be finalized as drafted.³⁴ Furthermore, for states that currently manage sewage sludge as a solid waste, there are questions regarding at what point in the treatment process sewage sludge becomes a solid waste and states could determine that RCRA obligations attach at different points in the treatment process. The current Proposed Rule only stands to further complicate these management questions.

Because of this uncertainty, NACWA requests that EPA more explicitly state that the final rule shall have no regulatory impact on sewage sludge that is not incinerated.

IV. The Domestic Sewage Exemption Prevents EPA from Regulating Sewage Sludge as a Solid Waste

Finally, NACWA believes the Domestic Sewage Exemption (DSE) in RCRA makes the Proposed Rule inapplicable to sewage sludge and that accordingly EPA lacks the legal authority to promulgate the rule. RCRA defines "solid waste" as:

any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage . . .*

RCRA § 1004(27) (emphasis added). Accordingly, sewage sludge from POTWs is exempt from the definition of "solid waste" as "solid or dissolved material in domestic sewage." Through the DSE, Congress recognized that treated sewage sludge does not qualify as a solid waste. *See also* 40 C.F.R. 261.4(a)(1).

³² See 2008 NEBRA National Biosolids Regulation, Quality, End Use & Disposal Survey at 19 (5 states were not classified).

³³ See, e.g., Ohio Administrative Code 3745-27-03(A)(8)(b) (excluding land applied sewage sludge from regulation under the state solid waste rules and defining sewage sludge as "as a solid, semi-solid or liquid residue generated *during* the treatment of sewage in a treatment works") (emphasis added); North Carolina General Statutes 130A-290(c)(35)(b)(1) (excluding from the definition of solid waste "solid or dissolved material in [d]omestic sewage and sludges generated by treatment thereof in sanitary sewage collection, treatment and disposal systems which are designed to discharge effluents to the surface waters.").

³⁴ For example, in Minnesota, "waste" is defined in Minn. Stat. 115A.03, subd. 34 as "solid waste, sewage sludge and hazardous waste." Each term is then defined separately (Minn. Stat. 116.06, subd. 22, Minn. Stat. 115A.03 and Minn. Stat. 116.06, subd. 11, respectively), creating separate regulatory universes for each. Minn. R. chapters 7035, 7041 and 7045.

This concept of a broad POTW exemption was established by Congress as early as 1965 in the Solid Waste Disposal Act.³⁵ This 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 Solid Waste Disposal Act and RCRA included the Domestic Sewage Exclusion in explicit recognition of this critical policy choice.³⁶

Indeed, as EPA began its long efforts to define “solid waste” and “hazardous waste” for purposes of Subtitle C of RCRA, the Agency explicitly understood and discussed the importance of the comprehensive federal sewage sludge management program. For example, in the 1980 preamble to EPA’s development of the Subtitle C regulations, EPA describes the importance, scope and ultimate supremacy of the to-be developed CWA § 405 program, indicating that, once this program was in place, it would serve as the comprehensive regulations for use and disposal of sewage sludge. 45 Fed. Reg. 33084, 33102 (May 19, 1980) (“Once such a regulation is in place, sewage sludge will be exempted from coverage under other sets of regulations.”). EPA has similarly 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. EPA concluded that POTW sewage sludge falls within the DSE:

These wastes [P038 and K048 wastes] are being added to the list of [hazardous] wastes . . . in order to regulate sludges generated at wastewater treatment facilities on site at petroleum refineries as well as sludges generated at off-site wastewater treatment facilities.¹⁴ . . .

¹⁴ It should be noted 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* and are not included in today’s listings.

55 Fed. Reg. 46354, 46364 (Nov. 2, 1990) (emphasis added). Thus, 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.

Furthermore, when Congress incorporated RCRA’s definition of “solid waste” in CAA § 129 in 1990, Congress was well aware that the DSE was encompassed in the definition of “solid waste” and that CAA § 129 would not apply to sewage sludge. This statutory exemption for sewage sludge – the subject of broad consensus and reliance in the regulated community – can not be abrogated by subsequent rule making or preamble statements. Moreover, the 1987 CWA amendments and the subsequent Part 503 rules established a management program for sewage sludge dependent on its exclusion from RCRA regulation.

Lastly, the statutory and regulatory provisions that implement the sewage sludge management program distinguish between sewage sludge and solid waste, and thereby demonstrate that they are different types of material. For example, the preamble to the Part 503 rules states that:

³⁵ Solid Waste Disposal Act, Pub. L. 89-272, 79 Stat. 992 (1965).

³⁶ 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).

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. In keeping with the distinctions drawn by Congress between sewage sludge and solid waste, EPA's careful regulatory approach in the Part 503 regulations distinguishes between sewage sludge and solid waste.

The DSE under RCRA is implemented through and supported by the comprehensive programs for sewage sludge management that have been carefully developed under CWA § 405 and RCRA. The proposed abrogation of the DSE places RCRA regulatory responsibilities on POTWs that Congress fully intended would not apply due to strict regulation of POTWs under the CWA. Losing the DSE will "federalize" decisions over how sewage sludge must be managed, which directly contravenes Congress' preservation in the CWA of local control over sewage sludge management options.

* * *

In summary, NACWA requests that EPA:

1. Exercise its discretion and exclude or exempt sewage sludge that is combusted from the final rule's definition of non-hazardous solid waste.
2. Recognize that sewage sludge and scum are legitimate fuels.
3. Classify the energy recovery and energy production devices employed by POTWs as legitimate energy recovery systems.
4. Clearly state that the rule does not apply to and will not impact other sewage sludge management options regulated under Part 503.

Please contact Chris Hornback at chornback@nacwa.org or 202-833-9106 with any questions regarding NACWA's comments.

Sincerely,



Ken Kirk
Executive Director

Attachments

Improvements in Biosolids Quality Due to EPA's Pretreatment and Biosolids Programs

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Abstract

Publicly owned treatment works (POTWs) across the United States have realized a major reduction in the heavy metals in their influent and effluent, along with a substantial improvement in the quality of their biosolids, due to the development and promulgation, by the United States Environmental Protection Agency (EPA), of the following regulations:

1. General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403), and
2. Standards for the Use or Disposal of Biosolids (40 CFR Part 503).

While professionals in our industry are well versed in the positive impact that these regulations have had on human health and the environment, efforts to document and report these impacts to the general public have been minimal.

Keywords

Biosolids, 40 CFR Part 503, Pretreatment, 40 CFR Part 403, Heavy Metals

Introduction

The Northeast Ohio Regional Sewer District (District) provides wastewater conveyance and treatment services for 1.1 million residents and businesses in the Greater Cleveland area. Since its creation in 1972, the District has spent over \$1.8 billion dollars to expand and upgrade its infrastructure.

The District's monitoring of industrial dischargers and enforcement of pretreatment regulations has effected a major reduction in heavy metals and other pollutants entering its three treatment facilities. These efforts, which have substantially reduced influent, effluent and biosolids metal concentrations, have been of value to the District's mission to protect public health and the environment.

National Pretreatment Standards

Pursuant to the Clean Water Act of 1977 and regulations enacted thereafter (specifically, 40 CFR Part 403), EPA established various responsibilities of Federal, State, and local governments, industry and the public to implement National Pretreatment Standards. Part 403 was enacted in January 1981, with the District obtaining approval for its pretreatment program on September 9, 1985.

One of the central objectives of the District's pretreatment program was the prevention of the introduction of pollutants into its three wastewater treatment plants (WWTPs) that interfere with the operation of its plants and the use or disposal of each plant's biosolids (i.e., sewage sludge).

History of the District's Pretreatment Programs

Several years prior to the promulgation of the National Pretreatment Standards, the District formed an Industrial Waste Section that ensured that the discharge of fats, oils, grease, acids and diesel fuels into Greater Cleveland's sewer system complied with the District's local limits.

Cyanide is a toxic pollutant that for many years was discharged without pretreatment. If concentrations of Cyanide reached certain levels in the POTW influent, it could cause inhibition of the treatment process. Elevated influent concentration may also pass through the treatment process and into the plant effluent. If toxic levels of Cyanide in the effluent were passed into the receiving stream, it would likely impact the viability of the organisms in the receiving water. Industrial Waste personnel reported that metal concentrations in the plants influent and biosolids substantially increased in the late 1970s due to the Cyanide destruction requirements. Up to that point in time, Cyanide used in industrial processes actually kept the heavy metals in solution. By requiring the industrial users to destroy Cyanide it allowed the metals to be suspended from solution and precipitated more readily at the POTW, increasing the metal concentrations in biosolids and reducing it in the final effluent.

The District pretreatment program was approved by USEPA in September 1985. The actual implementation of the program began in January 1984 under the authority of the District's Code of Regulations, Pretreatment Regulations. At that time, industrial dischargers falling under the existing or new categorical standards were inspected, sampled, and classified according to their applicable categories, and thereupon determined to be in or out of compliance.

The District then presented all industrial dischargers within its service area “administrative orders” to install the necessary pretreatment systems. The District typically monitors its industrial dischargers annually. Criteria for increased monitoring included past performance, citizen complaints, compliance status, potential for toxic discharges and the existence of any District enforcement judgments.

In addition to annual monitoring by District personnel, industrial dischargers were required to submit bi-annual self-monitoring reports, along with monthly samples of their waste.

Tracking-Down Illegal Dischargers

The District’s pretreatment strategy between 1975 and 1982 was (i) to require good housekeeping, conservation, and source control for heavy metals and (ii) require pretreatment for acids and cyanides. A major effort was made to inform local industrial dischargers of upcoming federal pretreatment regulations. The Greater Cleveland area had a substantial number of electroplaters and other industries traditionally having high concentrations of metals in their discharges. These firms were notified that upcoming federal pretreatment regulations would be aggressively enforced by District personnel. As a result, most industrial dischargers were prepared when the order to pretreat was given. Affected industries, under pressure from District, changed their processes from a wasteful high-water, non-conservative operations to processes using counter-current rinses, source control, and recycle techniques. The decrease in effluent metal concentrations after 1984 is due primarily to the enforcement of the federal pretreatment standards.

Metal Influent Reductions - Case Studies

To assess the impact of the District’s pretreatment program, the concentration trends for the certain metals were analyzed from 1980 to 2004. Only seven metals (cadmium, chromium, copper, lead, nickel, zinc and mercury) were consistently regulated under federal categorical discharge standards and local discharge limits, to have complete data. District influent data for mercury were available, however detection limits early in the pretreatment program were not as sensitive as they are today making it difficult to assess the effectiveness of the pretreatment program.

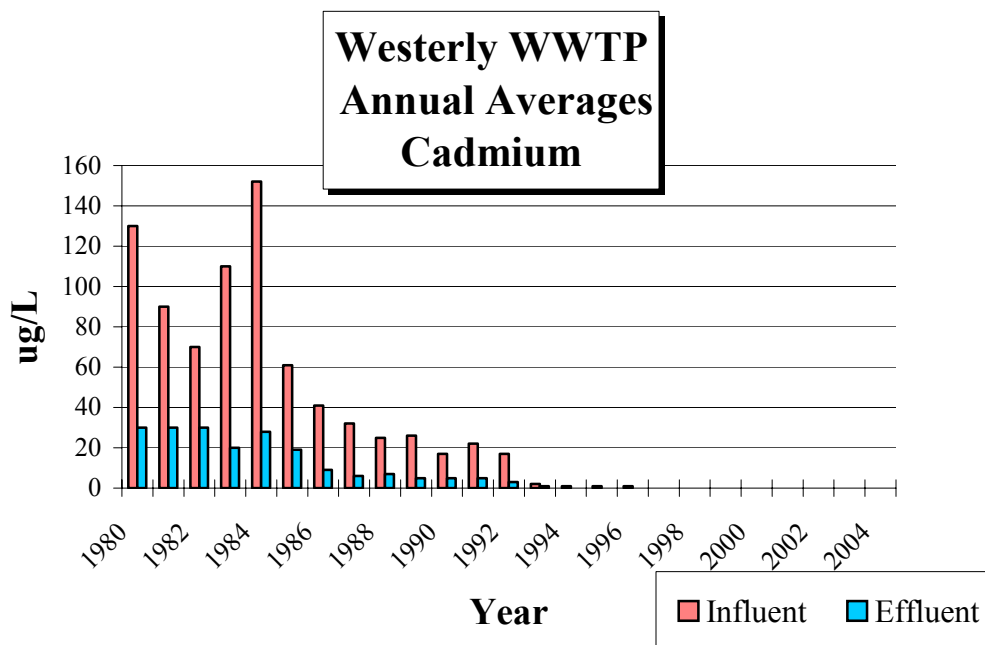
Cadmium

In 1981, the District implemented pretreatment requirements for the discharge of cadmium. This action resulted in a significant reduction in cadmium in the influent loadings at the District’s three WWTPs. The cadmium concentrations continued to decrease after the approval of the District’s federal pretreatment program. Many industries were willing to work at reducing their metal discharges in order to avoid administrative orders and litigation.

With the effectiveness of the District's pretreatment program, the Industrial Surveillance Section was able to identify industrial dischargers that were not in compliance. Many of these companies either had systematic problems with their pretreatment equipment or needed to implement a system.

In 1984, the District met with representatives of a plating operation located within the Westerly WWTP's service area after an analysis revealed that the company was out of compliance with Federal discharge limitations for cadmium. The outcome of the meeting resulted in the cadmium plating operation being eliminated. The company eventually installed a heavy metal removal system to prevent federal and local violations for other heavy metals. Figure 1 shows the 60% cadmium reduction between 1984 and 1985 in Westerly's influent, due to the elimination of one illegal discharger. A continued decline of cadmium concentrations was a result of the District's pretreatment program.

Figure 1. Westerly WWTP Influent and Effluent Cadmium Concentrations



Lead

In 1973, EPA initiated a "phase down" program designed to bring the levels of lead down in gasoline to 0.5 grams per gallon by 1980 in large refineries and by 1982 in small refineries. The standard allowed refineries to average their total (leaded and unleaded) output to reach the 0.5 standard.

In 1982, EPA changed the standard to 1.10 grams per leaded gallon but eliminated the provision that allowed averaging between unleaded and leaded gasoline. The new standard was projected to bring about a 34 percent reduction in the amount of lead being used by the refining industry as the demand for leaded gasoline declined.

Standards to phase out lead in gasoline came into effect in January 1986 and limit the lead content of gasoline to 0.10 grams per gallon. In January 1996, the Clean Air Act banned the sale of leaded fuel.

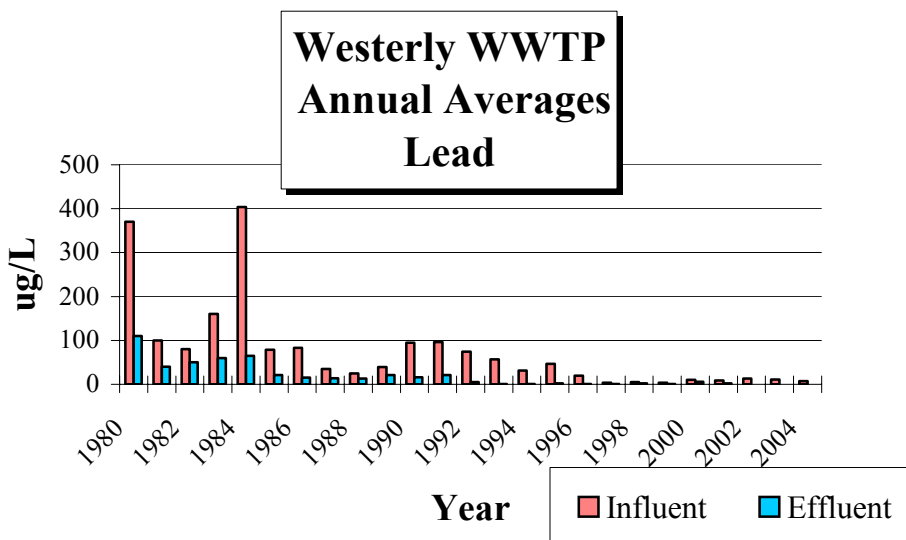
These rulings had a remarkable impact on lead concentrations coming into the District's three treatment plants. The monitoring and enforcement of the pretreatment program also helped reduce discharges.

In 1984, a plating firm located within the Westerly WWTP's service area was found to be discharging extremely high levels of lead. An inspection by District personnel revealed that the high lead concentrations were attributed to lead anodes and lead lined storage tanks. After the plating firm instituted a program to contain and haul the lead discharged to an approved waste treatment facility, Westerly's influent lead concentrations dropped by 77%.

Throughout the 1980's and early 1990's, lead was a major concern coming into the Westerly plant. The major contributor of lead was a smelting facility located along the west bank of the Cuyahoga River. Smelting is the process of reducing reclaimed lead compounds to elemental lead and lead alloys. The company would crack large batteries by lifting them into the air and dropping them onto the ground causing the battery to crack. Battery acid would spill onto the ground containing high levels of lead. Although the company was not directly discharging to the sewer system, during wet weather events, runoff from the site would enter into the combined sewer system that was tributary to Westerly. In 1993, the State of Ohio shut the facility down and in 1999, U.S. EPA began a final clean up.

Figure 2 shows lead concentrations coming into the Westerly plant from 1980 – 2004. years. The spike seen in 1984 was due to a single illegal discharger. Concentrations in the mid-1990's dropped due to the lead smelting facility ending operation.

Figure 2. Lead Influent and Effluent Concentrations at Westerly WWTP



Influent Loadings Reduction

Since the inception of the pre-treatment program at the District, metals have had a continued downward trend in treatment plant influents and effluents. From 1980- 2004, the District has seen a substantial reduction in metals entering its three-wastewater treatment plants. The following are a few examples of overall metal reductions in the plants' influent and effluent. Figures 3 through 5 show the reduction of heavy metal concentrations entering the three treatment plants in 2004 compared to 1980. These figures demonstrate the success of the District's pretreatment program. Table 1 shows the average influent and effluent reductions of the six metals evaluated in the paper over the last 24 years coming into the District's three treatment plants.

Figure 3. Easterly WWTP Heavy Metal Influent Concentrations and Percent Reduction

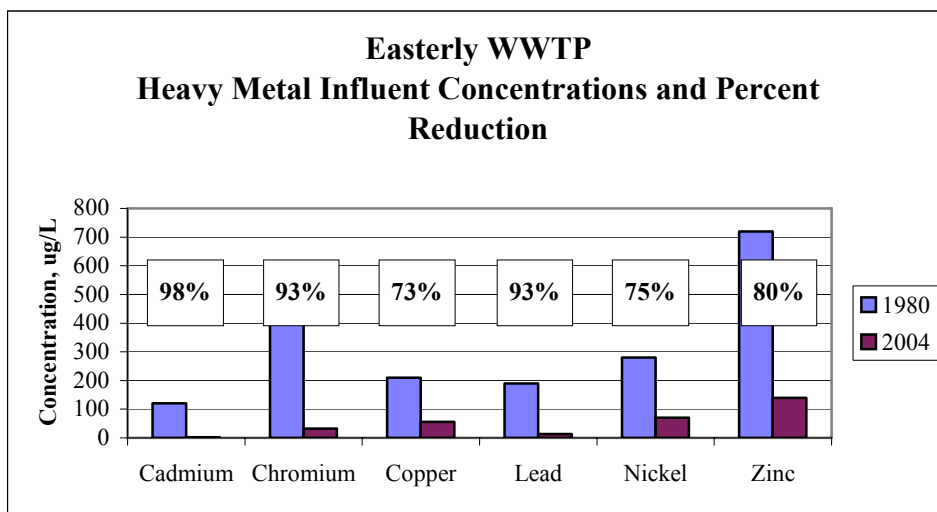


Figure 4. Southerly WWTC Heavy Metal Influent Concentrations and Percent Reduction

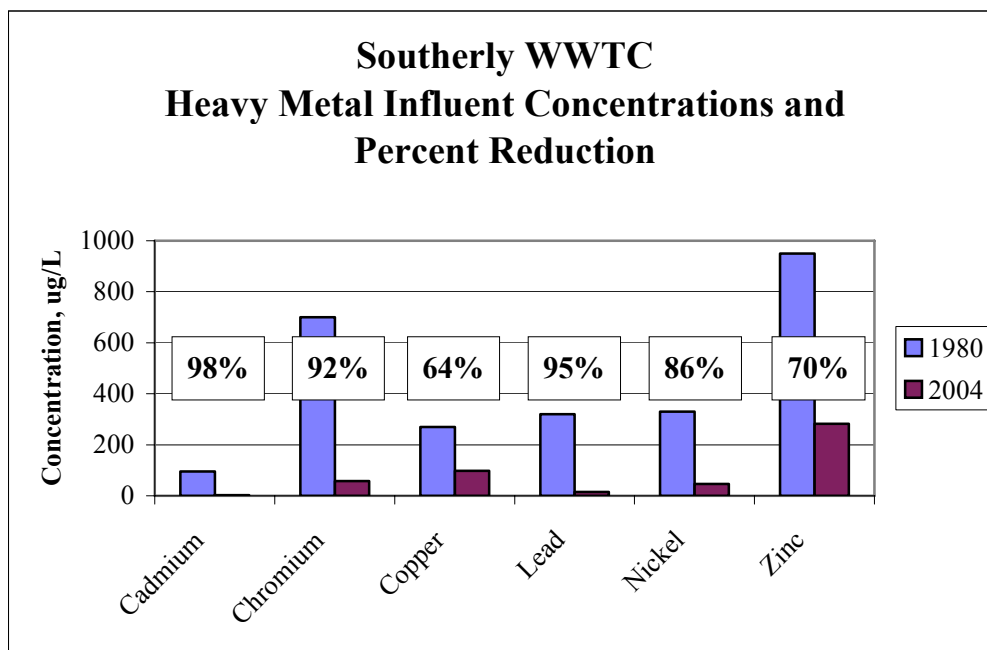


Figure 5. Westerly WWTP Heavy Metal Influent Concentrations and Percent Reduction

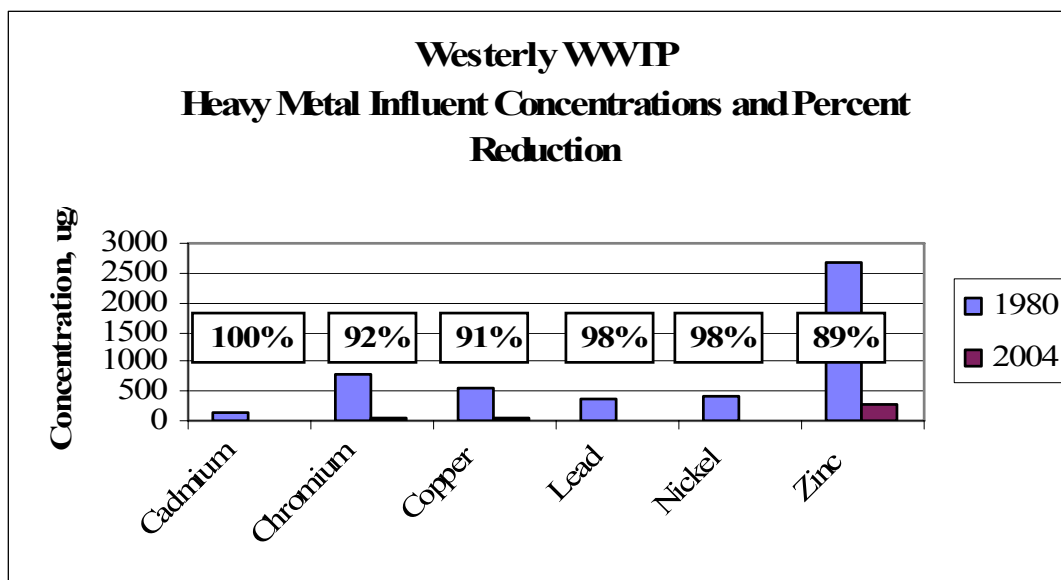


Table 1: Average Reductions in Selected Metals from 1980 – 2004 for NEORSD's Three WWTPs:

Metal	% Reduction in Influent	% Reduction in Effluent
Cadmium	99	99
Chromium	90	97
Copper	62	90
Lead	95	100
Nickel	89	90
Zinc	87	90

Industrial Changes in Greater Cleveland

A common inquiry regarding the reduction trends in heavy metals is whether or not the decrease in concentrations can also be attributed to the decline of heavy industry in Northeast Ohio. The following are the numbers of electroplaters monitored by the District for specified years:

- 1985-130
- 1990-143
- 1995-133
- 2000-121
- 2005-111

Today there are fewer electroplating companies compared to when the pretreatment program was implemented. However, the data listed above show that between 1985 and 1990 there was an increase in electroplaters. Heavy metal concentrations at the treatment plants declined during this timeframe. Appendix A of this paper contains figures showing the decline of heavy metal influent and effluent concentrations.

National Biosolids Regulation

In the early 1990's, the District started to update its Code of Regulations to integrate potential changes in federal and state regulations related to pretreatment. At this time, the District also began to evaluate how to reduce metal concentrations in its biosolids pending future biosolids regulations. As required by the Clean Water Act Amendments of 1987, USEPA developed a new regulation, 40 CFR Part 503, to protect human health and the environment from any reasonable anticipated adverse effects of certain pollutants that might be present in biosolids. Enacted in February 1993, Part 503 forced POTWs to carefully examine the metal concentrations in their biosolids and biosolids incinerator exit gases, and to find ways to reduce the metal concentrations and emissions. As a result of the Part 503 regulations, the District bolstered its pretreatment program to further decrease metal concentrations.

The District uses incineration to manage its biosolids. Solids from the Easterly WWTP are pumped through a 13-mile long force main to the Southerly WWTC for processing and disposal in Southerly's four multiple hearth incinerators (MHIs). Westerly's biosolids are burned in two MHIs located at Westerly.

Case Study - Cadmium

Prior to the promulgation of the Part 503 Regulation, the District undertook a program to ensure compliance with the proposed incineration related metal limits. One concern was with higher than normal cadmium concentrations being found in Southerly's biosolids. As previously mentioned, Southerly receives approximately 50% of its solids from the Easterly WWTP.

An in-house study was commissioned in 1993 to investigate higher than expected cadmium concentrations at the Easterly plant during the early 1990's. This was accomplished by sampling the tributary interceptors to the treatment plant. As a result of the pretreatment standards, industrial discharges were typically so void of heavy metals that the interceptor carrying the excessive loading was identified readily.

In 1994, a single plating firm in Easterly's service area was found to be bypassing pretreatment by discharging its waste during wet-weather events directly to its sewer. The company was issued a Cease and Desist Order and recommended for Show Cause Hearing. The company was fined over \$20,000 and the owner was ordered to upgrade its pretreatment system to meet all applicable federal and local discharge limits prior to being allowed to discharge into the sanitary sewer system again.

In October 1998, a review of the monthly operating report by District personnel noted a marked increase of cadmium concentration in the biosolids at the Southerly WWTC. Samplers were deployed downstream of known cadmium sources. Within the laboratory turn around time, the source was identified and a Cease and Desist Order issued to the industrial user. The plating company was cooperative in rehabilitation of its pretreatment system and cessation of discharge during the period. A Show Cause Hearing was recommended for discharge violations and a settlement was reached.

Figure 6 demonstrates the effectiveness of the District pretreatment program. A decrease in annual cadmium concentrations at the Southerly WWTC can be seen after the pretreatment programs was approved in 1985 and again after 1993 when the Part 503 programs were announced. Monthly peaks shown on the figure also show when companies were illegally discharging.

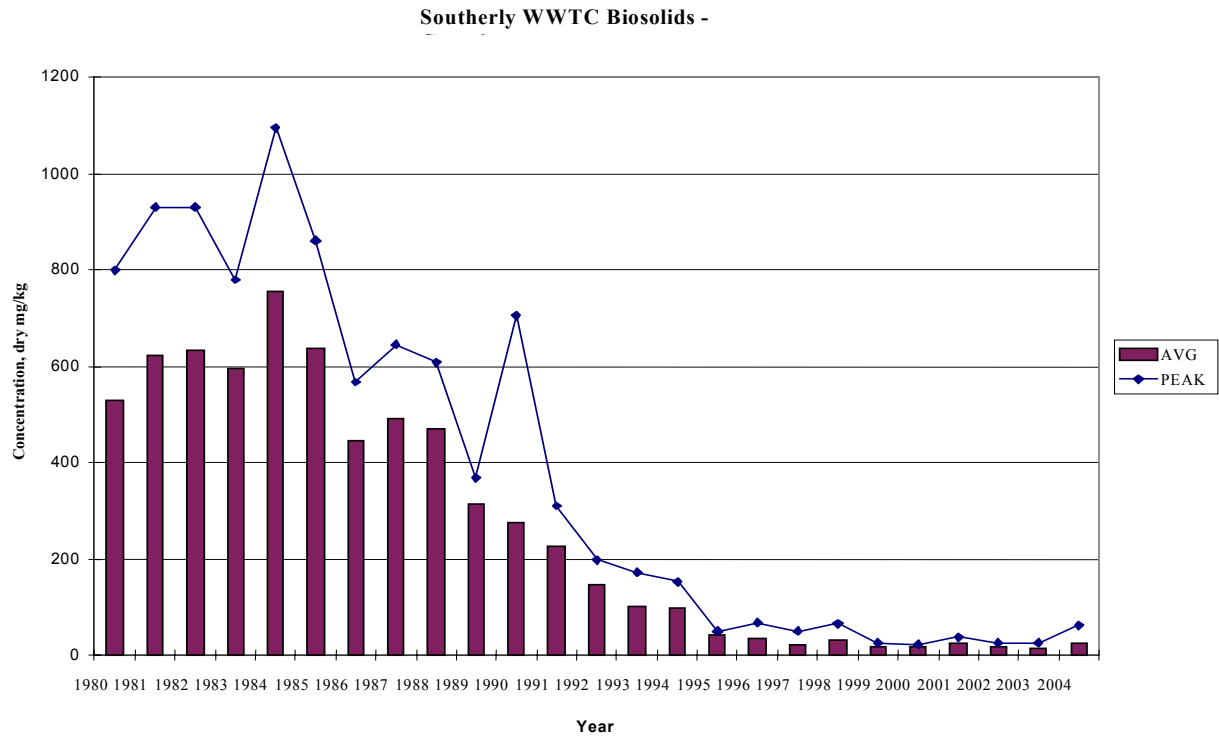


Figure 6. Cadmium Concentrations (dry weight basis) in Southerly Biosolids

In the late 1990s, given potentially more stringent regulatory requirements and rising operational and maintenance costs, the District decided to embark on a thorough investigation of potential residuals management options, through a residuals management study. One of the first actions taken was to determine how the quality of Southerly and Westerly's biosolids compared to the land application requirements contained in the Part 503 Regulation. Columns 1 and 2 contain the Part 503 Pollutant concentration limits for biosolids that are land applied, while Columns 3 and 4 show Southerly and Westerly actual biosolids concentrations. Table 2 clearly demonstrates that Southerly and Westerly's biosolids metal concentrations are substantially below the Part 503 land application metal limits.

Table 2: Part 503 Land Application Limits vs. Actual 2004 Concentrations

Pollutant	<u>Column 1</u> Ceiling Concentrations (mg/dry kg)	<u>Column 2</u> Pollutant Concentrations (mg/dry kg)	<u>Column 3</u> Southerly WWTP Highest 2004 Monthly Average Concentrations (mg/dry kg)	<u>Column 4</u> Westerly WWTP Highest 2004 60-day Average Concentrations (mg/dry kg)
Arsenic	75	41	10	13
Cadmium	85	39	62	18
Chromium	Deleted in 1995	Deleted in 1995	441	435
Copper	4300	1500	529	489
Lead	840	300	185	227
Mercury	57	17	3	1
Molybdenum	75	Deleted in 1994	20	25
Nickel	420	420	119	72
Selenium	100	100	15	2
Zinc	7500	2800	1486	2123
	All biosolids that are land applied	Bulk and bagged biosolids		

Table 3 shows Southerly and Westerly's site specific Part 503 Limits and the maximum concentrations.

Table 3: Part 503 Site Specific Incineration Limits vs. Actual 2004 Concentrations

Notes:

Pollutant	Southerly WWTP Part 503 Limit (mg/dry kg)	Southerly WWTP Highest 2004 Monthly Avg. Concentration (mg/dry kg)	Westerly WWTP Part 503 Limit (mg/dry kg)	Westerly WWTP Highest 2004 60-day Avg. Concentration (mg/dry kg)
Arsenic	292	10	511	13
Cadmium	272	62	450	18
Chromium	18,071	441	50,473	435
Lead	12,508	185	2,678	227
Nickel	379,429	119	168,995	72

Site specific limits are based on the quantities of biosolids incinerated and air pollution control devices' actual control efficiencies for arsenic, cadmium, chromium, lead and nickel.

Table 3 clearly demonstrates that Southerly and Westerly's biosolids metal concentrations and resulting air emissions are substantially below the Part 503 site specific incineration limits.

From 1980 to 2004, NEORS D has seen a substantial reduction in metals in its biosolids. The following are a few examples of overall metal reductions in the plants' biosolids:

Figure 7. Southerly WWTC Heavy Metal Biosolids Concentrations (dry weight basis) and Percent Reduction

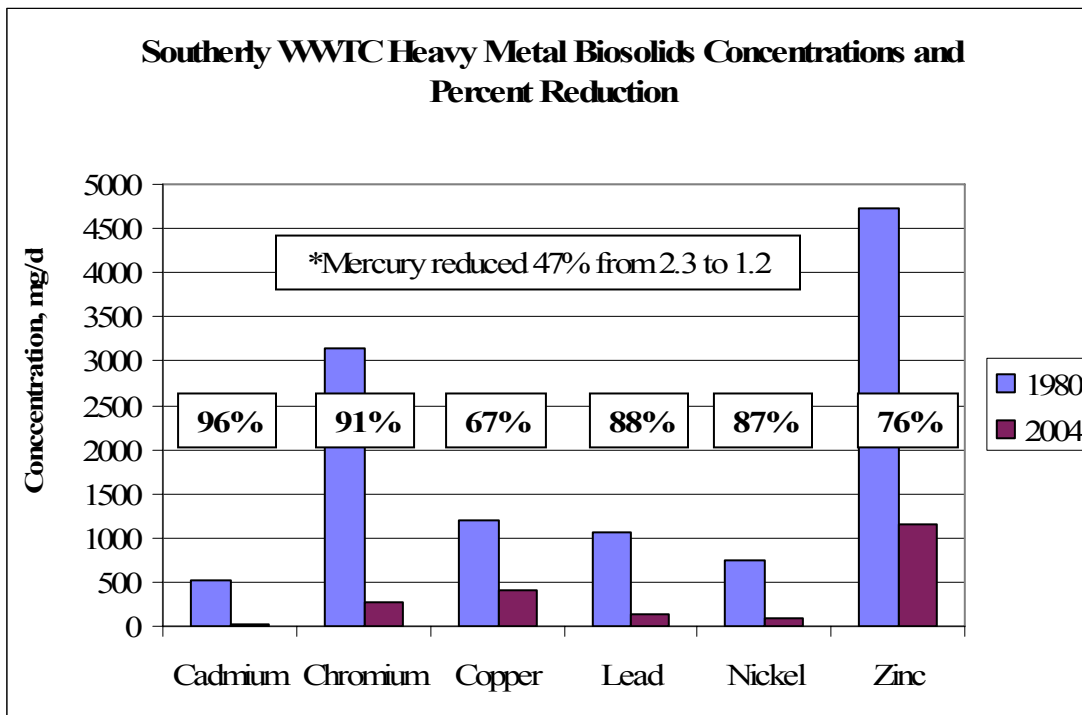


Figure 8. Westerly WWTP Heavy Metal Biosolids Concentrations (dry weight basis) and Percent Reduction

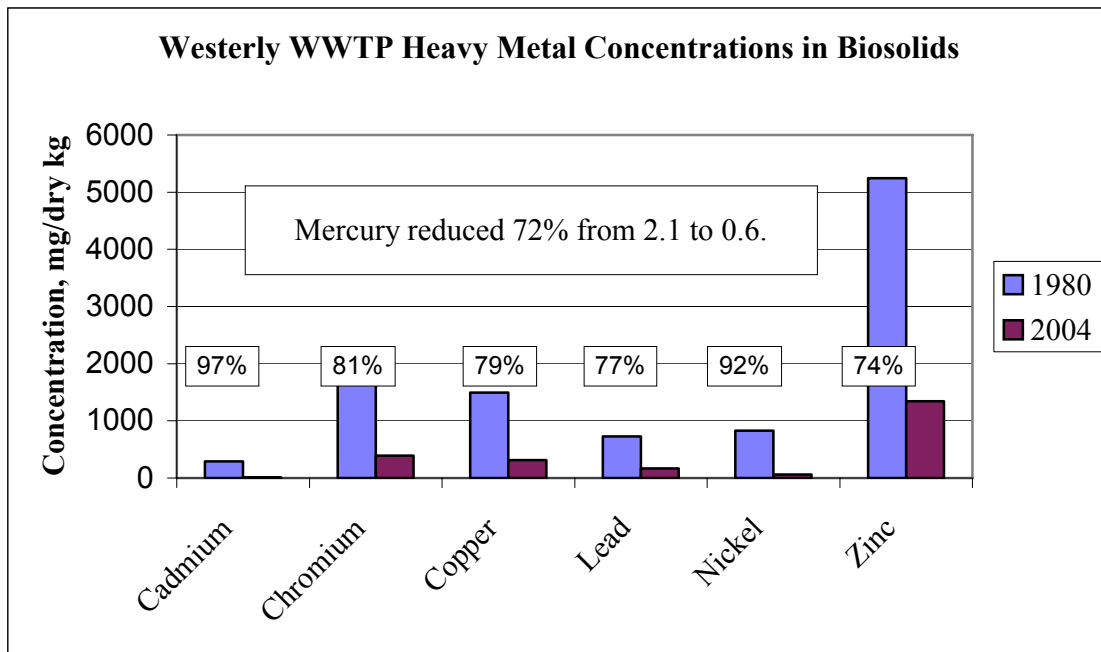


Table 4: Average Reductions in Selected Metals from 1980 – 2004:

Metal	% Reduction in Biosolids
Cadmium	96
Chromium	86
Copper	73
Lead	82
Nickel	96
Zinc	81
Mercury	60

Lessons Learned

Since the Industrial Waste Section was created in 1974, the District's knowledge base has improved markedly. The department, now called Water Quality and Industrial Surveillance (WQIS) has learned the key to a successful program includes employee safety, working with other enforcement agencies and maintaining a thorough database of all industrial users.

The District leverages its strong relationships with other enforcement agencies to track down illegal or accidental discharges. The Superintendent of Environmental Services is on a local pollution control task force. The District also works with local fire departments, hazardous material units and emergency planning committees to keep communication present. The WQIS department only has limited sets of eyes to watch over a large service area, therefore it is essential to work with other agencies and keep them on the lookout for illicit discharges.

The most useful tool in tracking down illegal discharges is a well-maintained and complete database of industrial customers. When the pretreatment program was implemented, the District maintained a list of industries including contact names, water usage and what they discharge (e.g., cadmium) in an Access database. Today, the department is taking advantage of more current technologies to manage pretreatment information and is using these tools to streamline its work.

Using a pretreatment information management system (PIMS), the pretreatment program is able to integrate its laboratory data, currently in a system called LABlynx, with its pretreatment data. This allows WQIS to ensure industries are in compliance from annual monitoring samples, assess surcharge costs for treatment, and provide a warehouse for documentation and inspection reports.

The District has also implemented an industrial user monitoring system, which is similar to a residential home security system. The system notifies the Control Authority of an event at an Industrial User, such as abnormal pH or a discharge valve being opened or closed. The system is currently being upgraded to deliver data about the event rather than simply an occurrence.

The last information management system being employed includes an industrial discharger's digit dialer. This system automatically calls a dedicated phone line at an industrial discharger delivering a message to cease or resume discharging to the sewer system. The system makes the calls based on flow conditions in the combined sewer system or capacity at the tributary POTW. The tool was developed to reduce concentrations of pollutants typically associated with industrial discharges during combined sewer overflows. In cases where an industrial discharger is required to be on both the monitoring system and the dialer, data compiled can be compared to ensure that the industrial user complies with the stop discharge order and closes the discharge valve in a timely manner.

Currently, the District is developing a Geographic Information System (GIS) tool to integrate the sewer system infrastructure with the LABlynx PIMS. The GIS tool will help spatially locate industrial users on a service area map and allow PIMS data to be shared throughout the organization through a user friendly interface. Users can view this data without the risk of making any changes to the data.

Combining these two information systems connects industrial users to the collection system and will allow network tracing upstream or downstream of a particular point. In the future, when a location has been found to have high levels of a particular contaminant, the GIS and PIMS tool will be able to identify users with this contaminant upstream of the location.

Conclusions

Due to the implementation of the Federal Pretreatment Standards along with Federal Standards for the Use or Disposal of Biosolids, the District has seen a substantial reduction in metal concentrations in its influent, effluent, biosolids and biosolids incinerator exhaust gases. Normally spikes in metal concentrations in influent and biosolids can be attributed to a single illegal discharger. Care must be taken to know the locations of your industrial dischargers, their operations, and the metals that they are normally discharging to the sewer system.

The implementation of these programs by the Northeast Ohio Regional Sewer District has resulted in the protection of human health and the environment.

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Terry Meister
Timothy Tigue
James Weber
Ray Weeden

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Long-Term Residuals Management Options for the Northeast Ohio Regional Sewer District, Lori Stone and Bob Dominak, Presented at WEFTEC 2003

Monthly NPDES Reports - Easterly, Southerly and Westerly (1980 – 2004)

Annual Part 503 Reports - Southerly and Westerly (1993 – 2004)

Appendices

Appendix A : Easterly WWTP Influent and Effluent Heavy Metal Concentrations

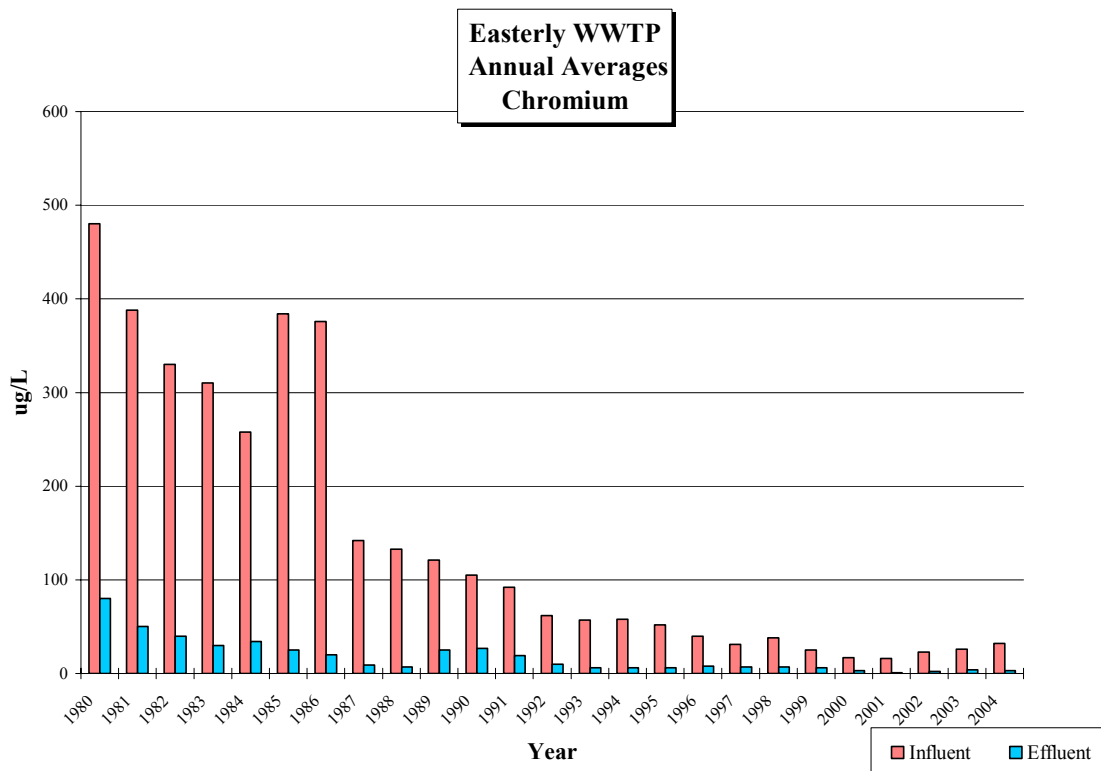
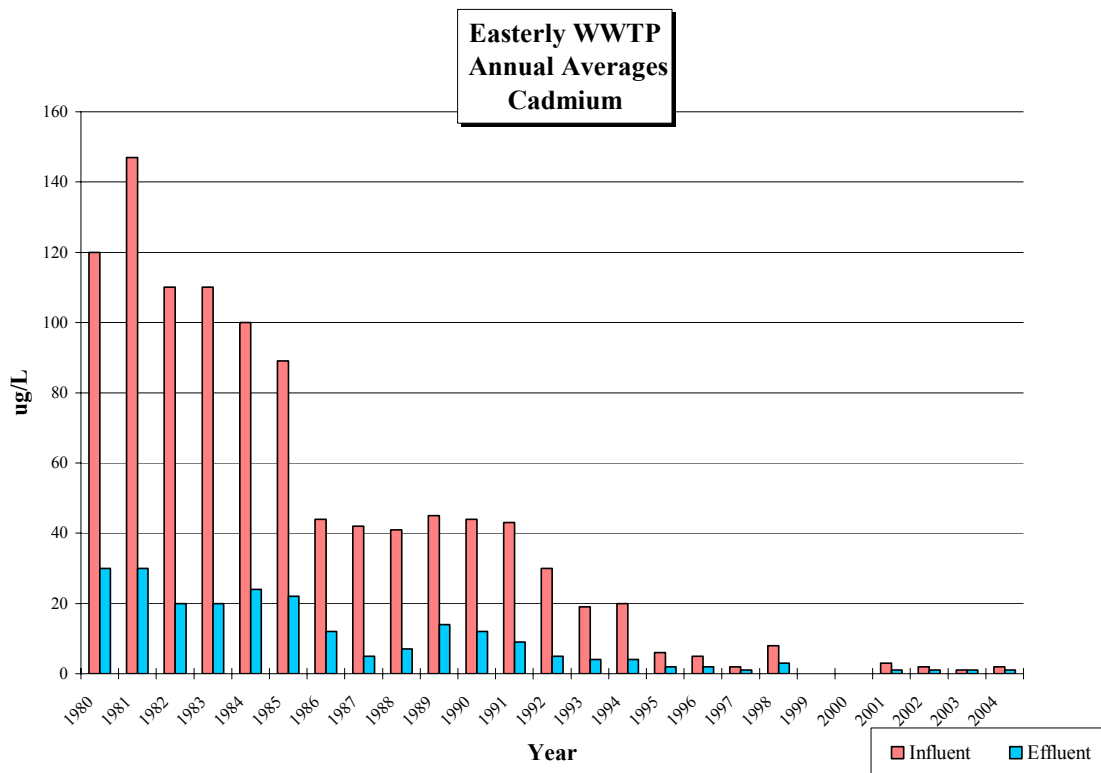
Appendix B: Southerly WWTC Influent and Effluent Annual Average Heavy Metal Concentrations

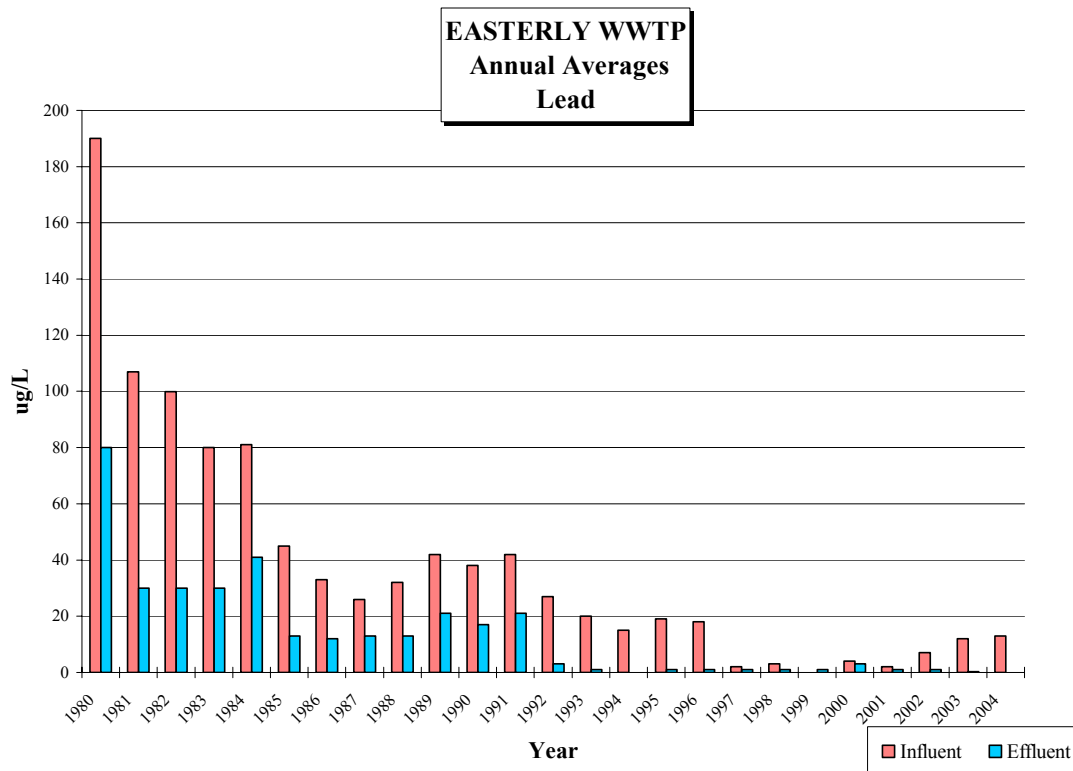
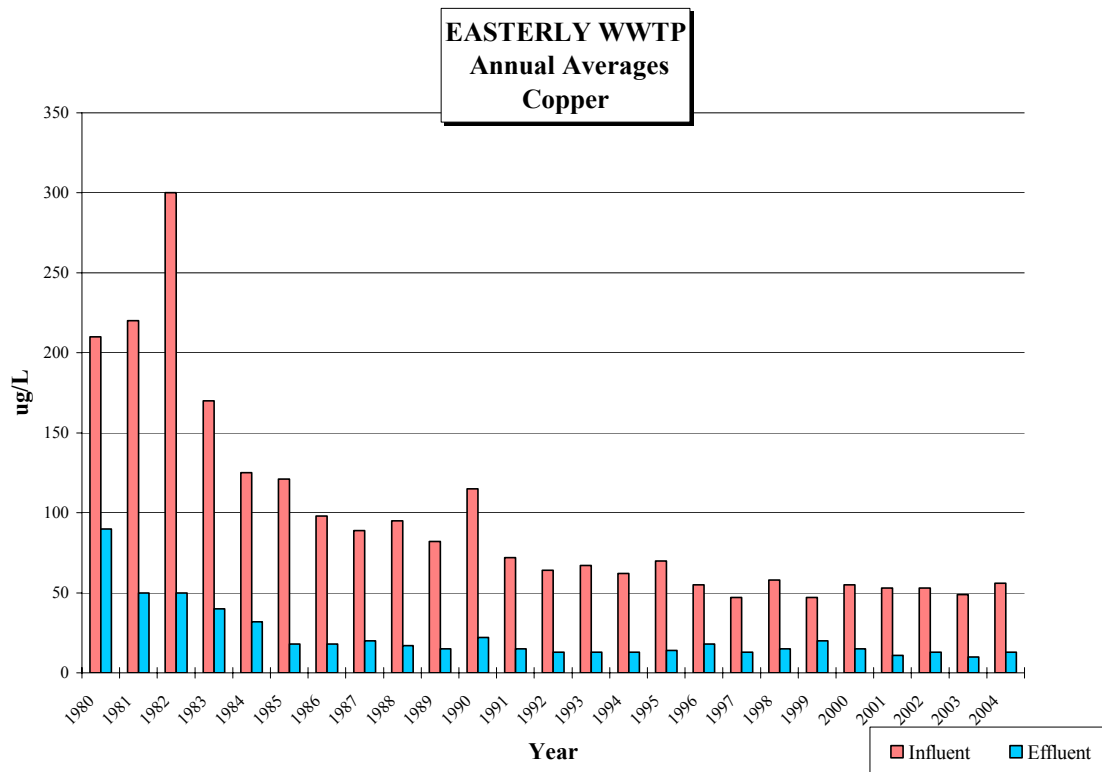
Appendix C: Westerly WWTP Influent and Effluent Annual Average Heavy Metal Concentrations

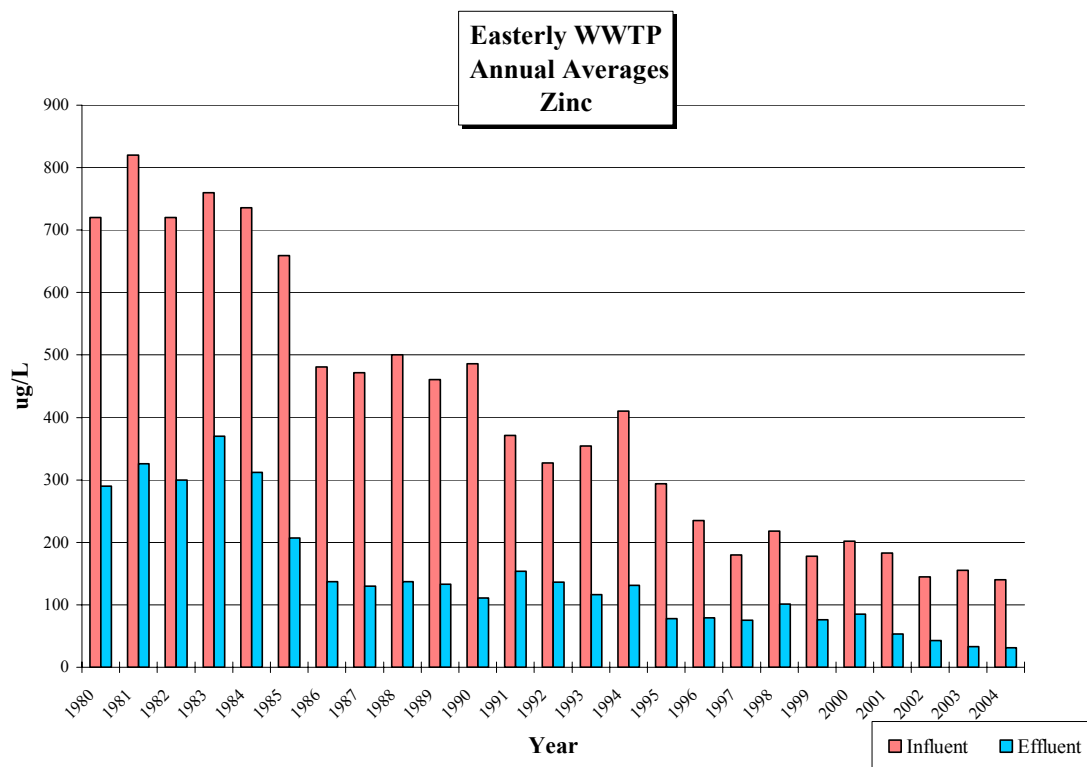
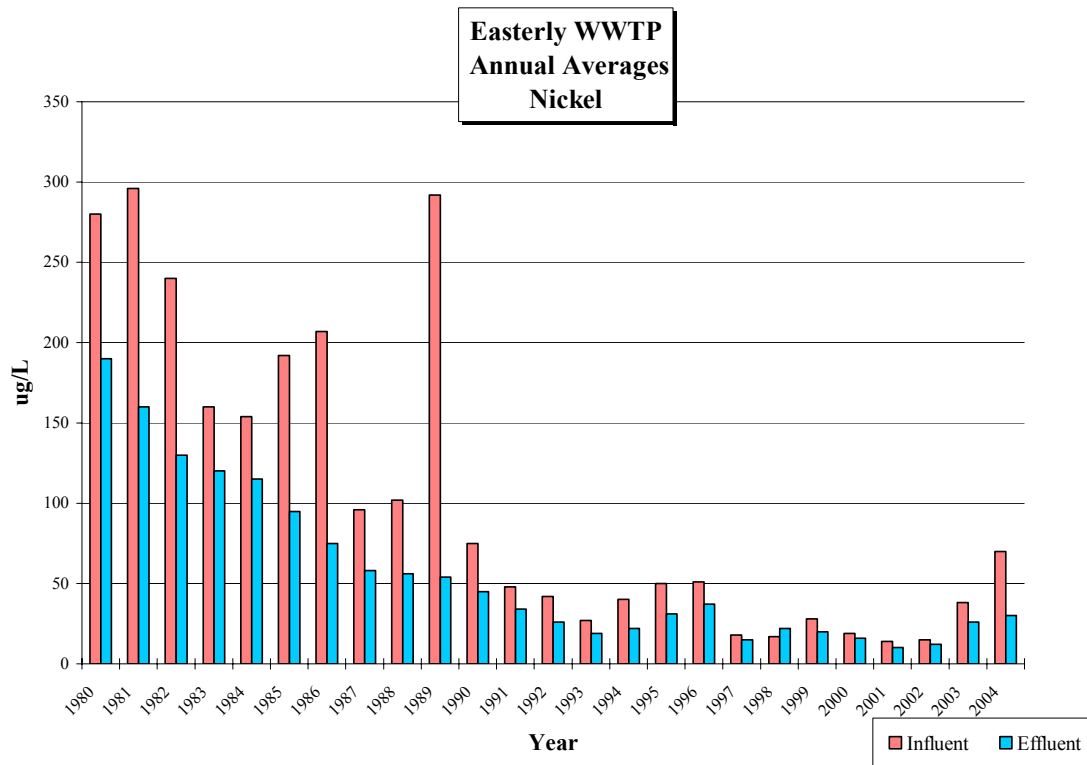
Appendix D: Southerly WWTC Heavy Metal Biosolids Concentrations (dry weight basis) – Annual Average and Monthly Peaks

Appendix E: Westerly WWTP Heavy Metal Biosolids Concentrations (dry weight basis) – Annual Average and Monthly Peaks

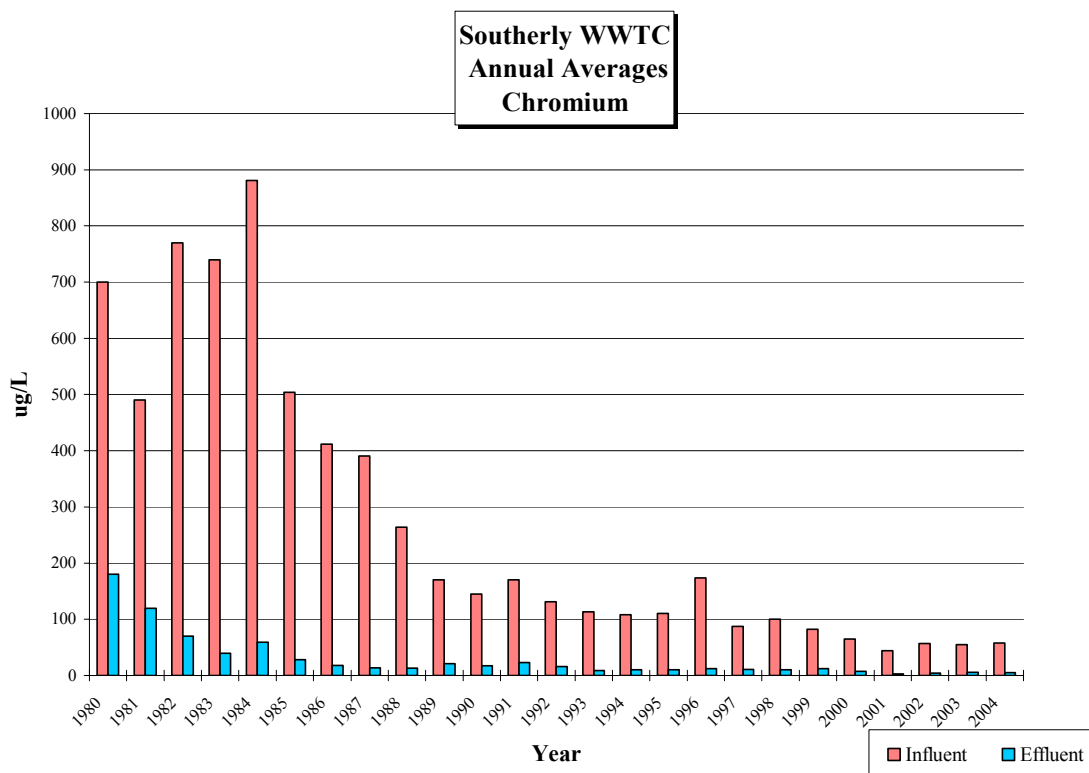
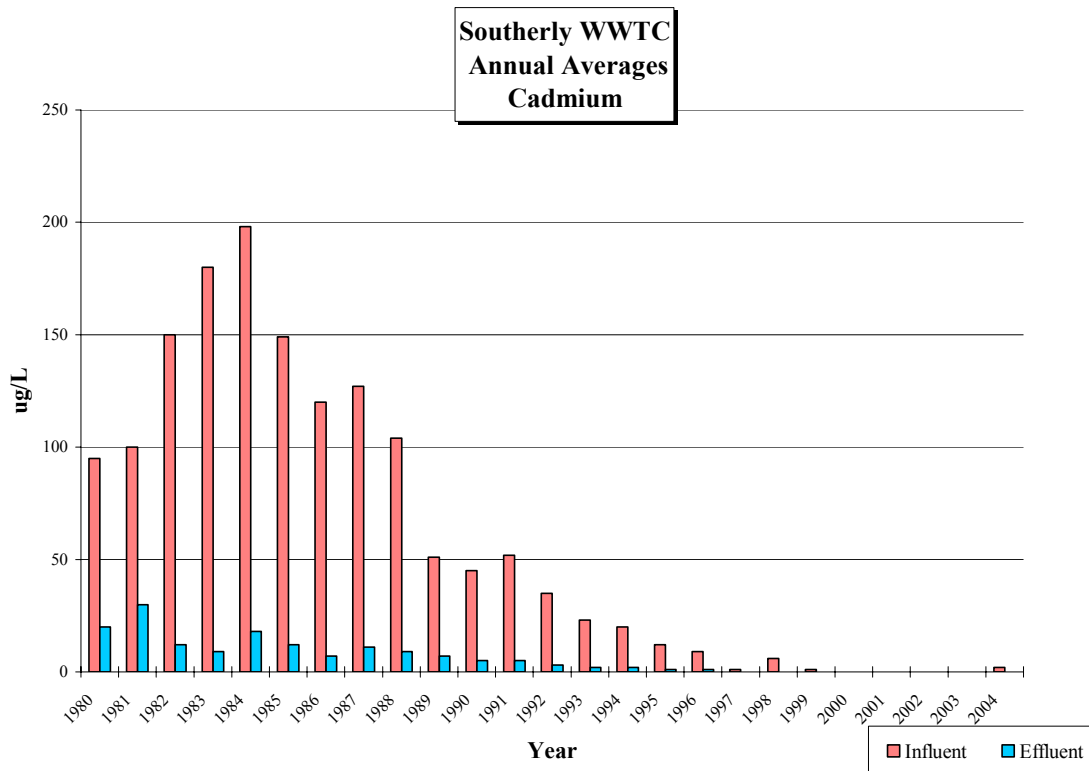
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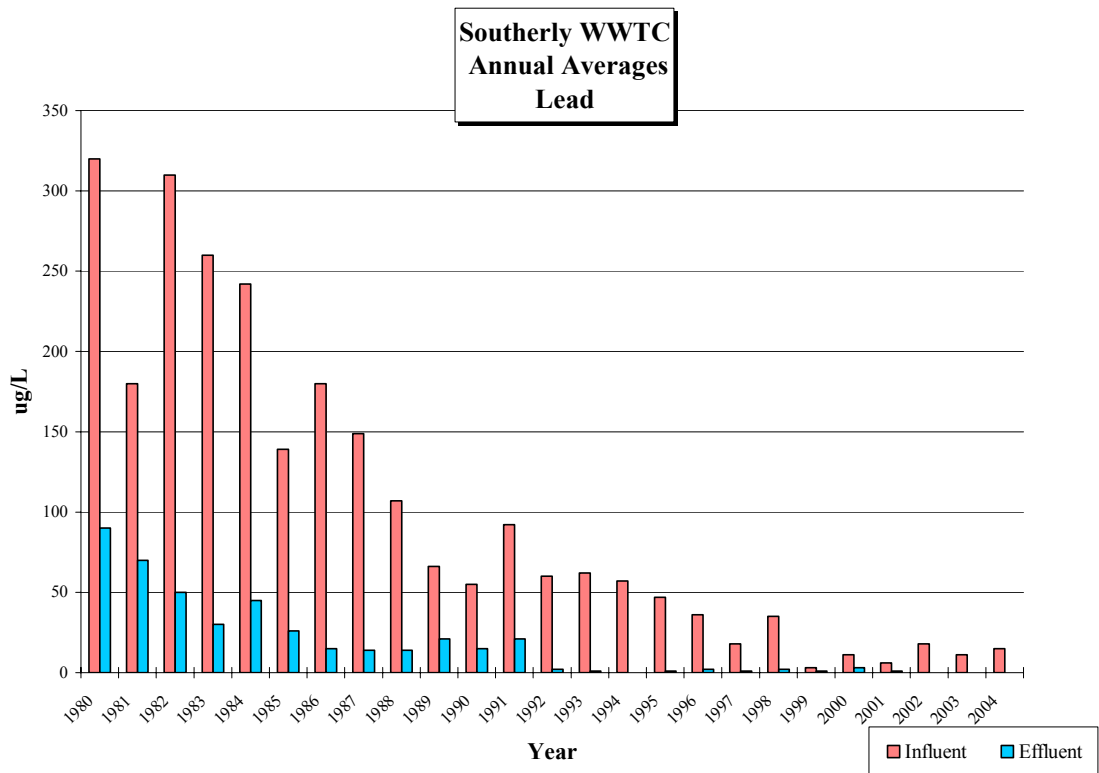
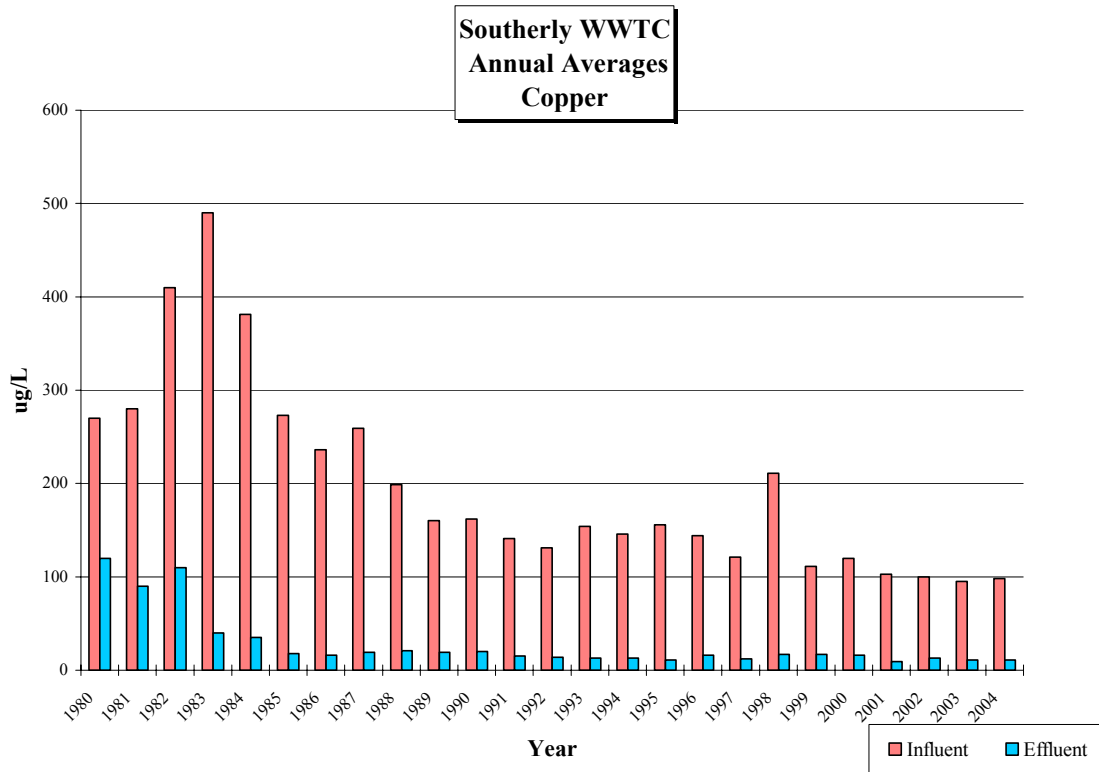


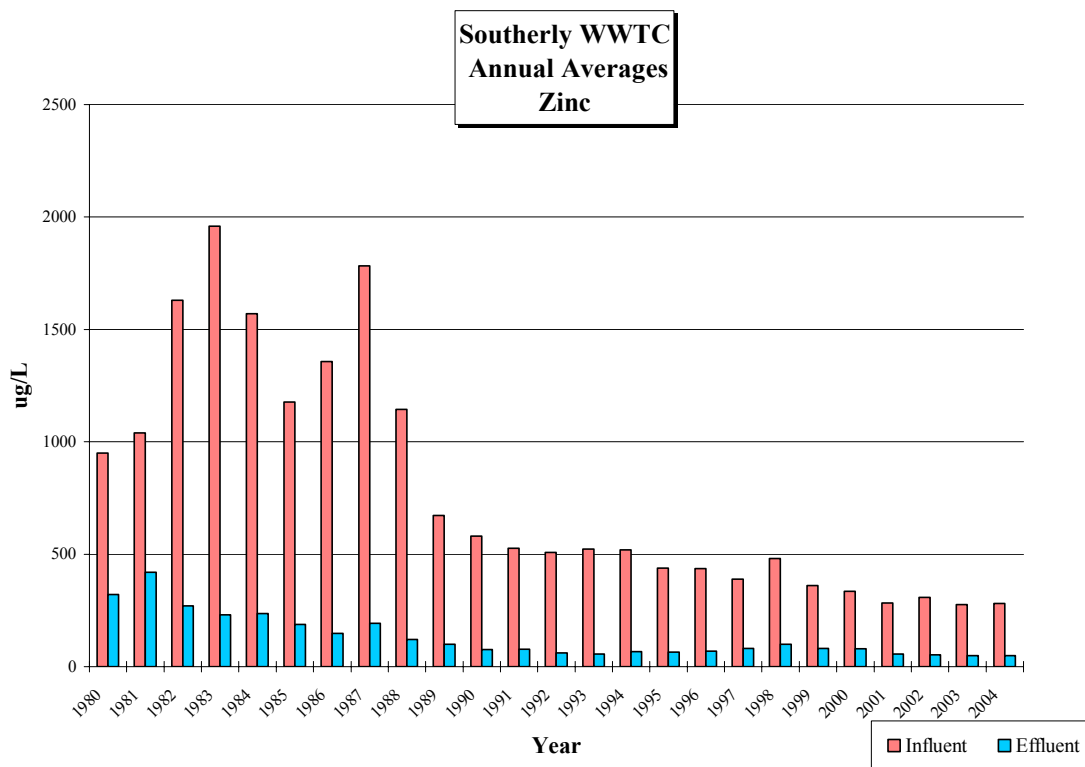
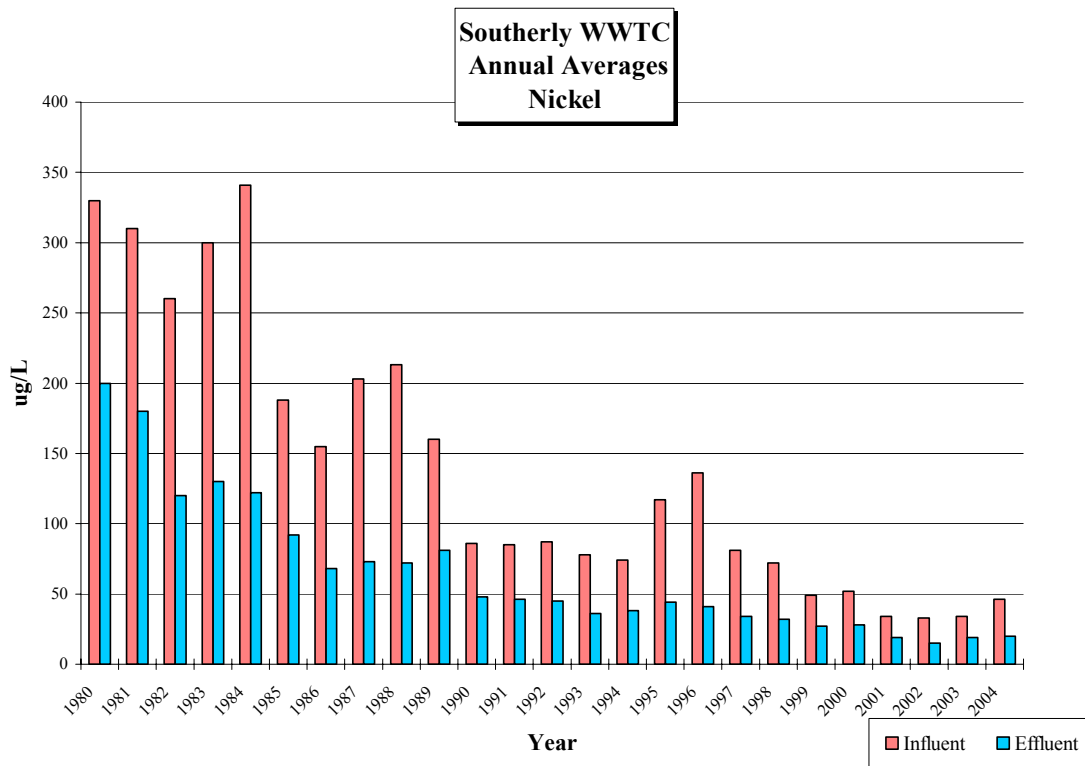




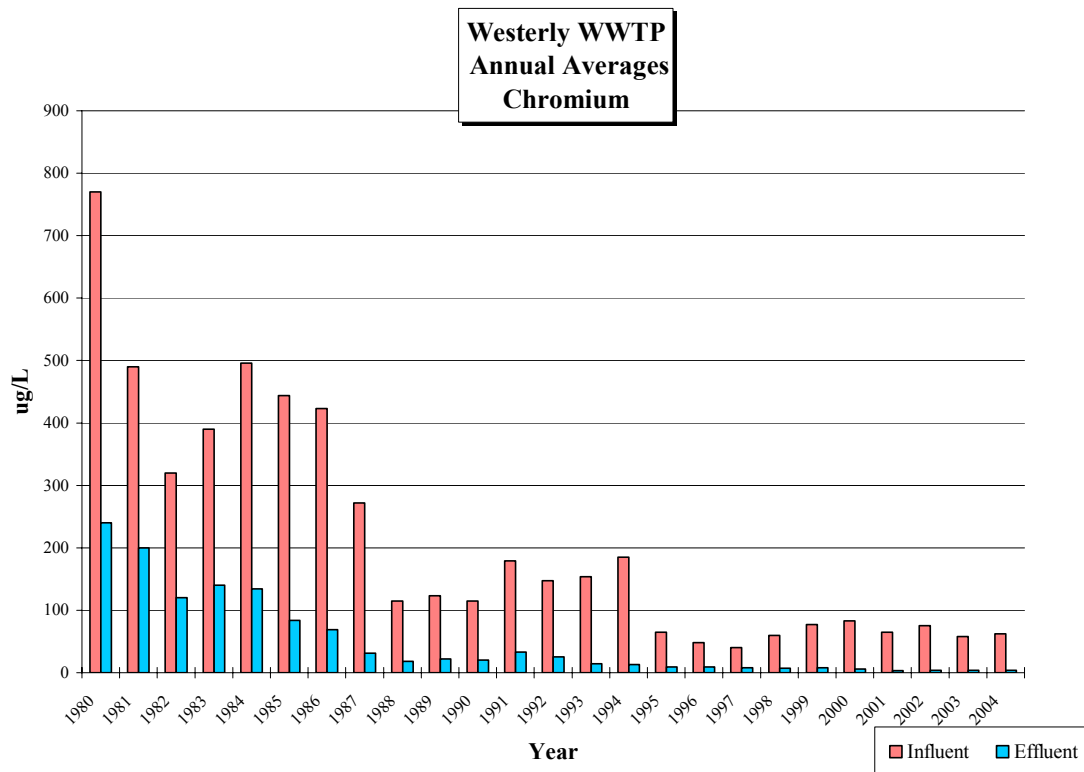
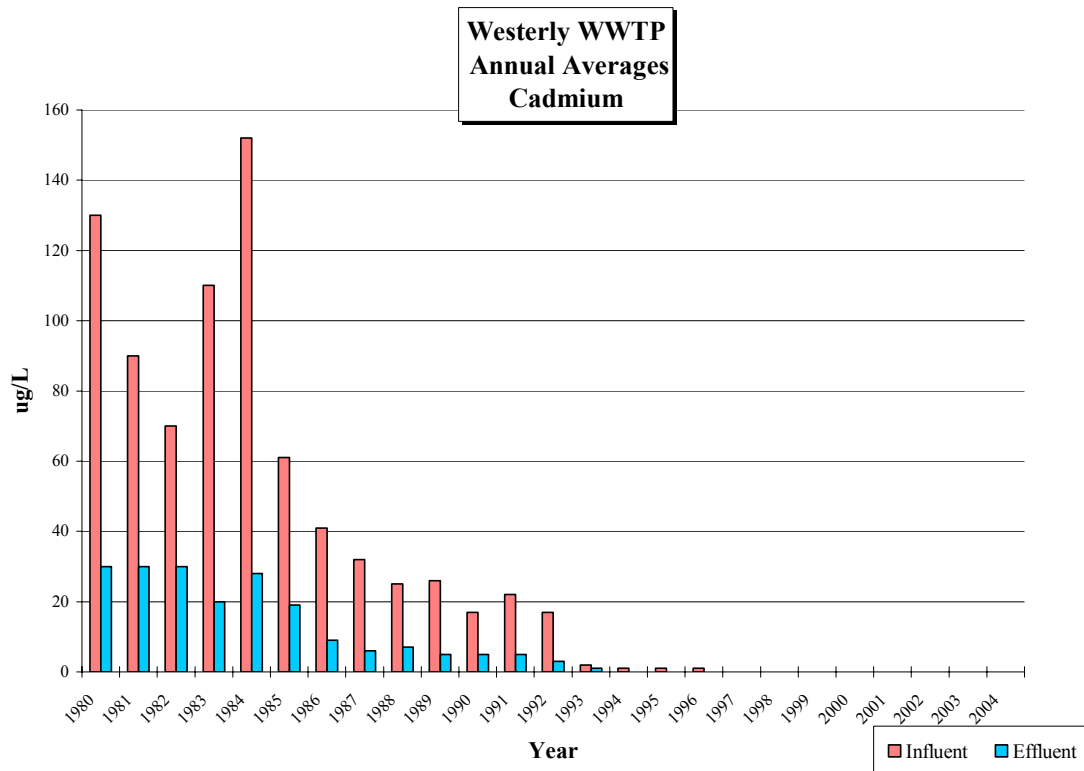
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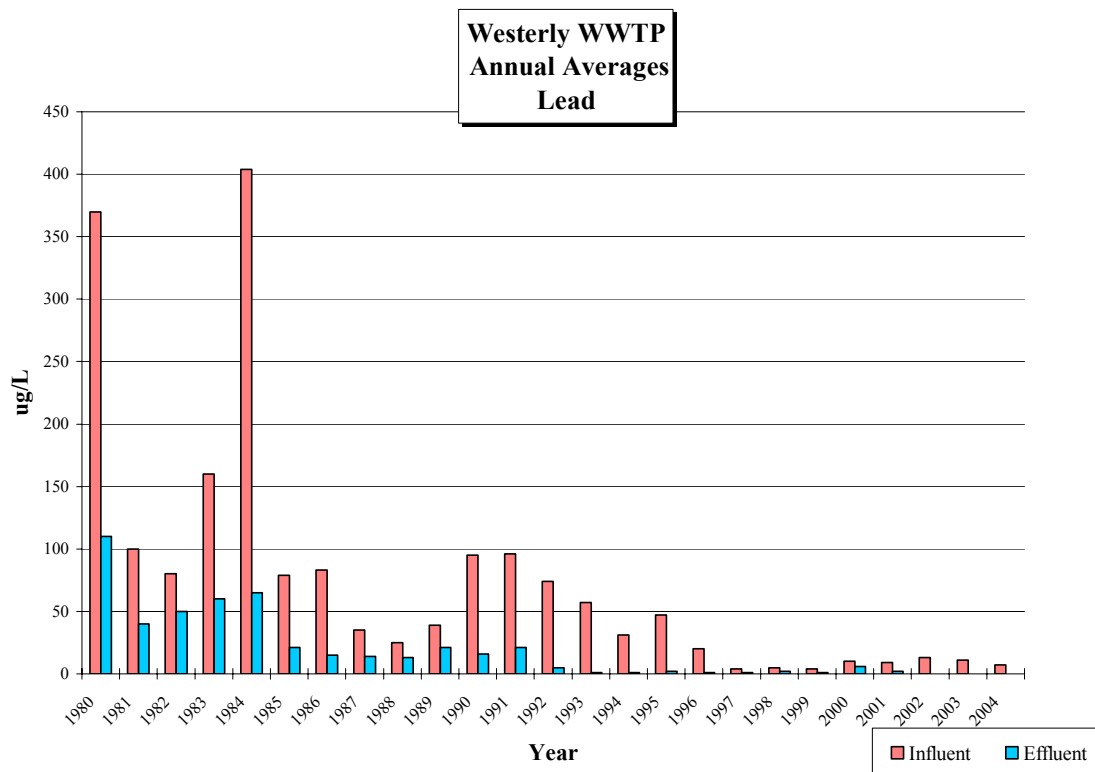
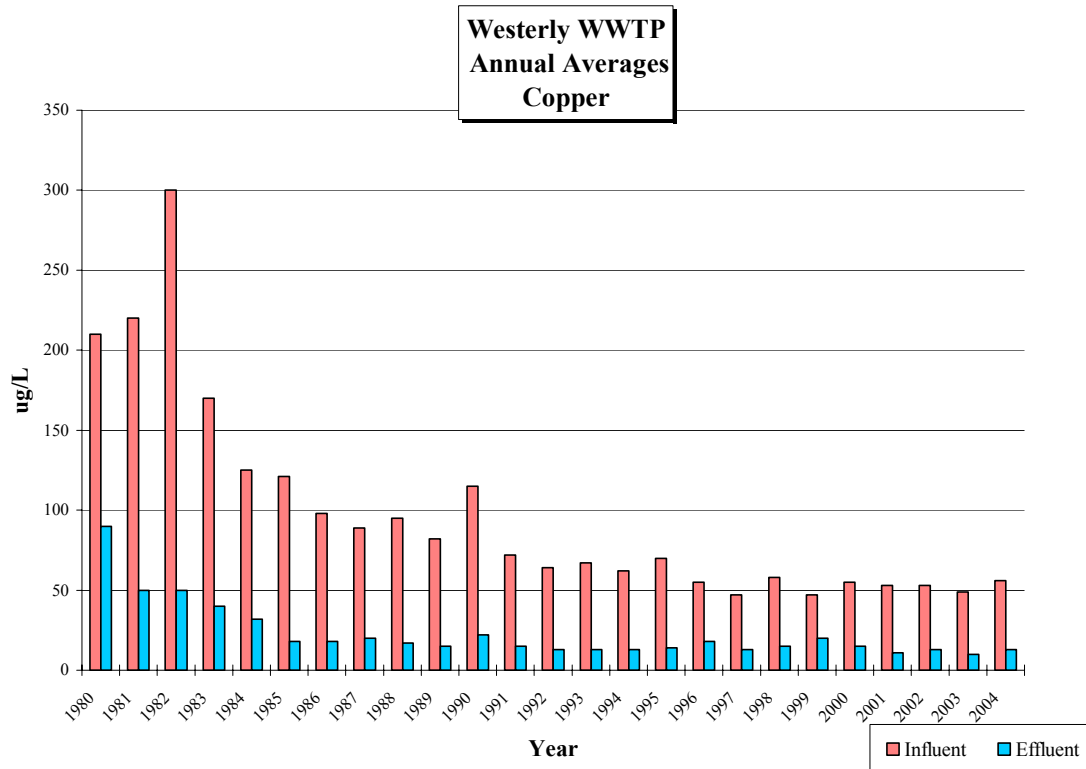


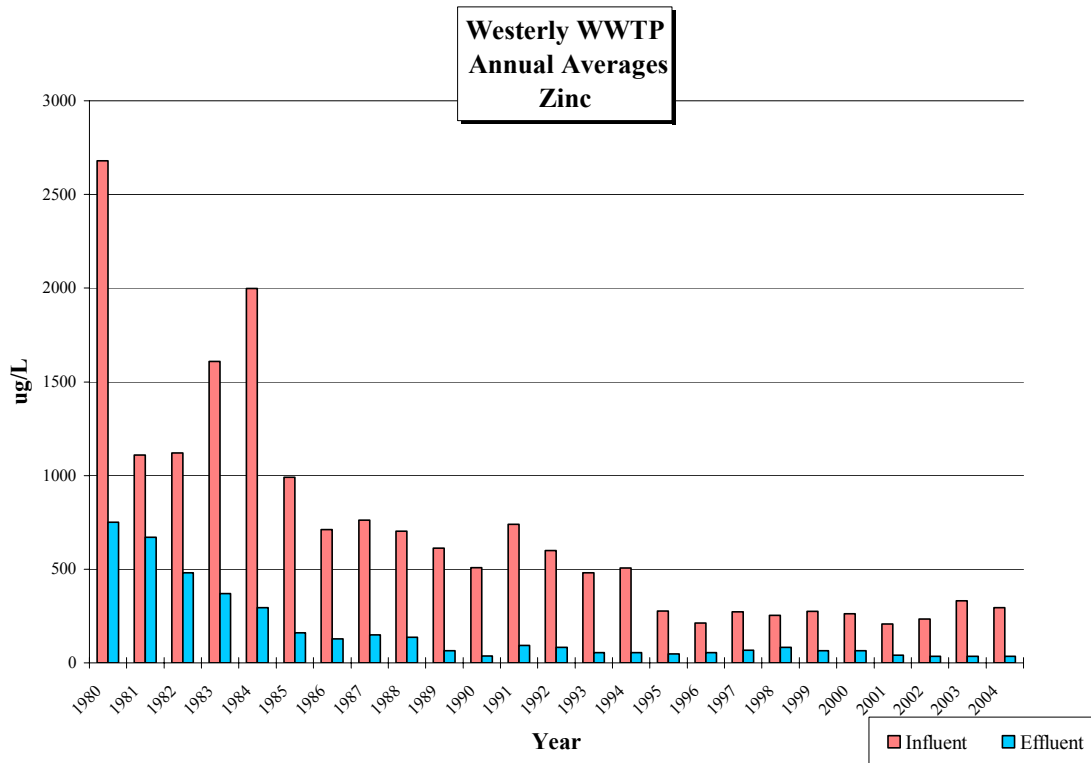
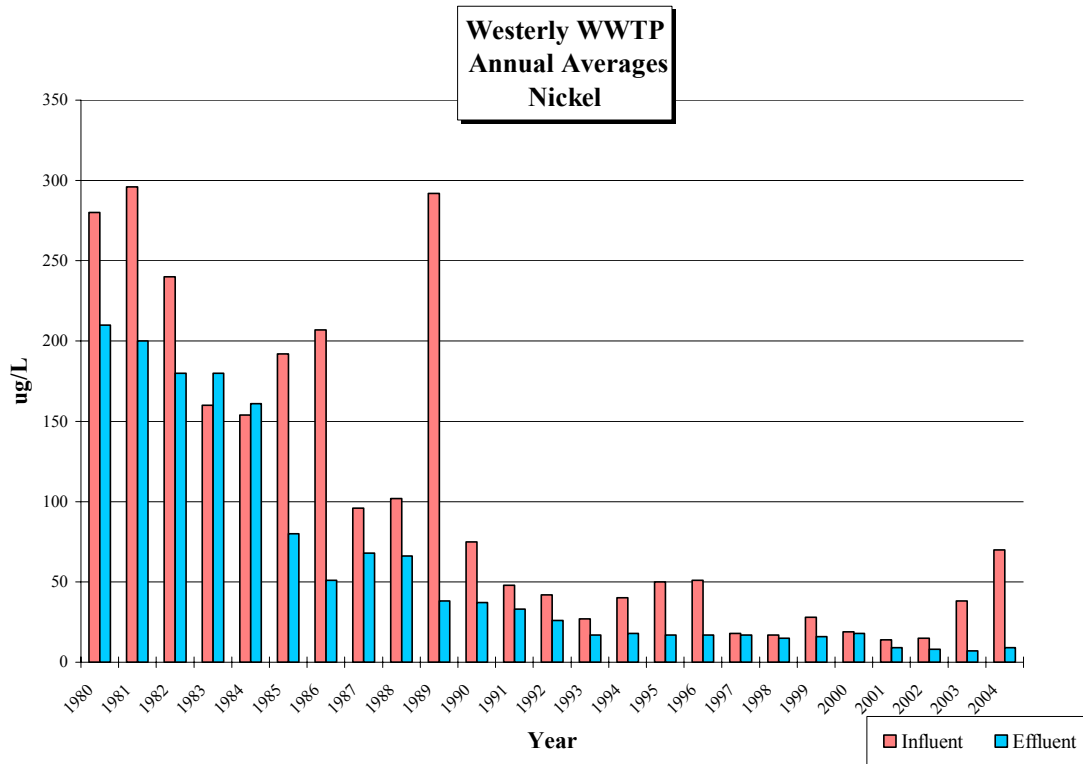




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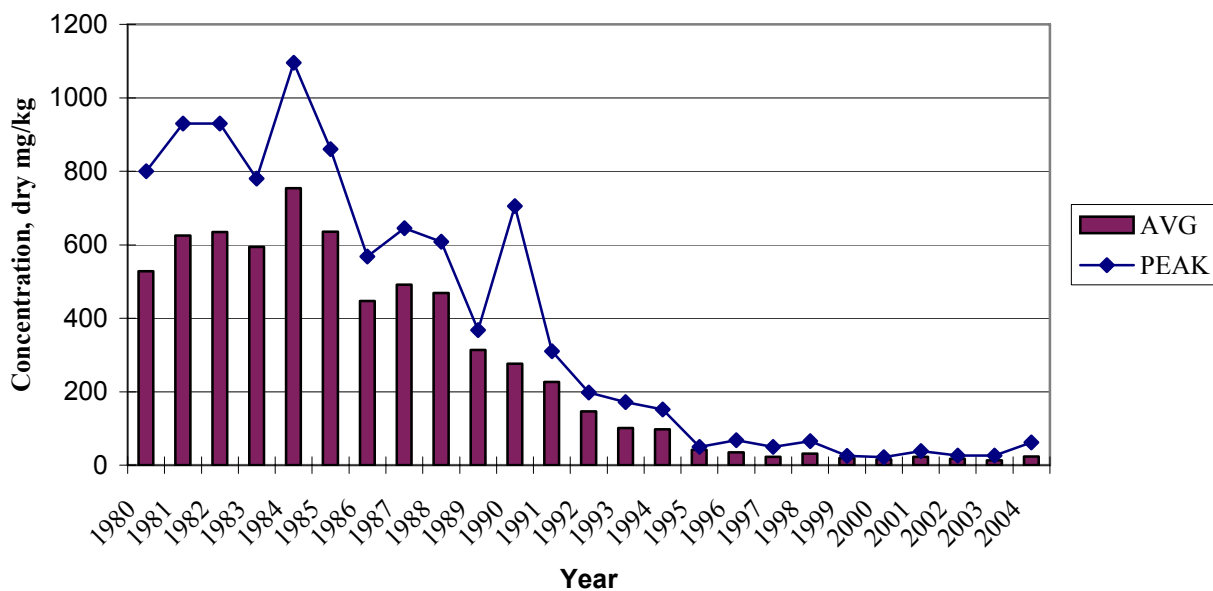




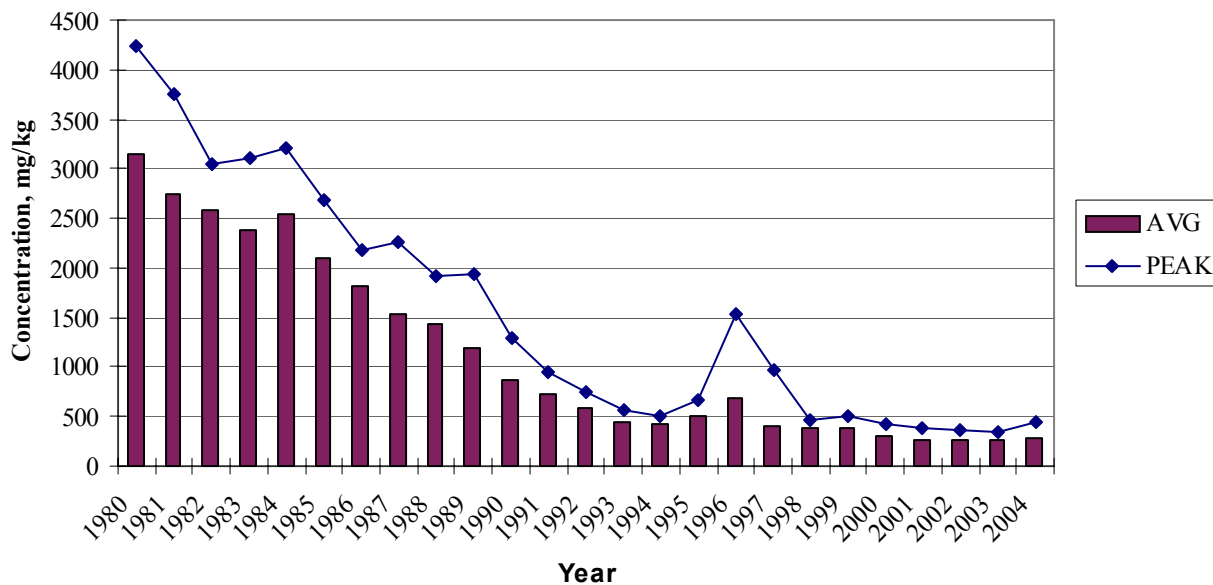


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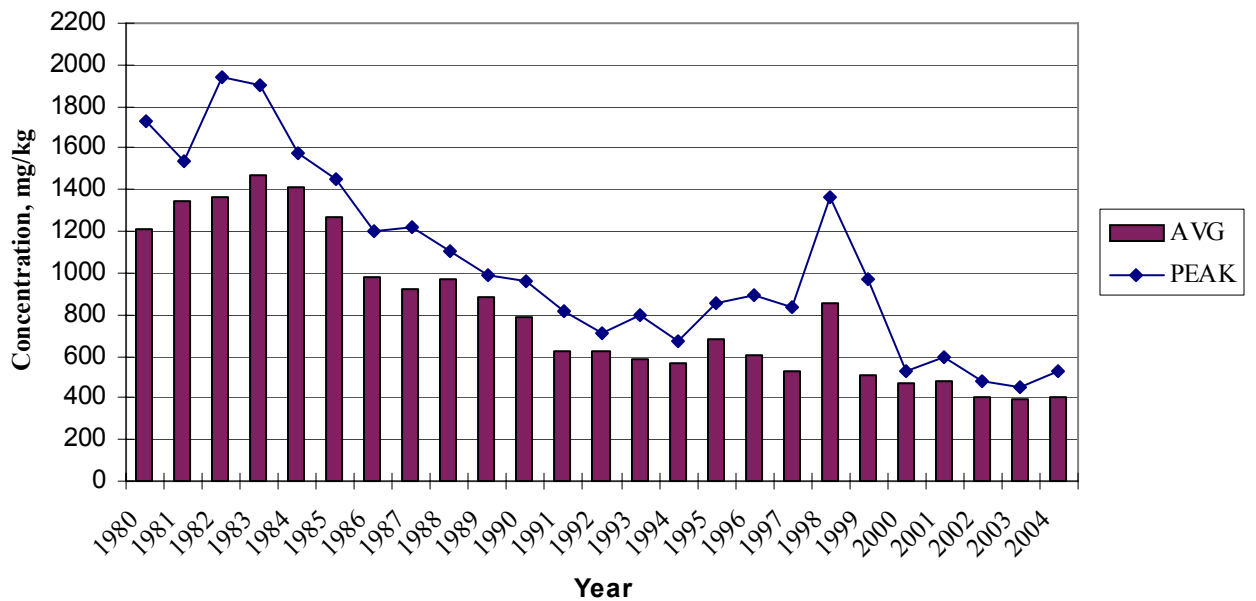
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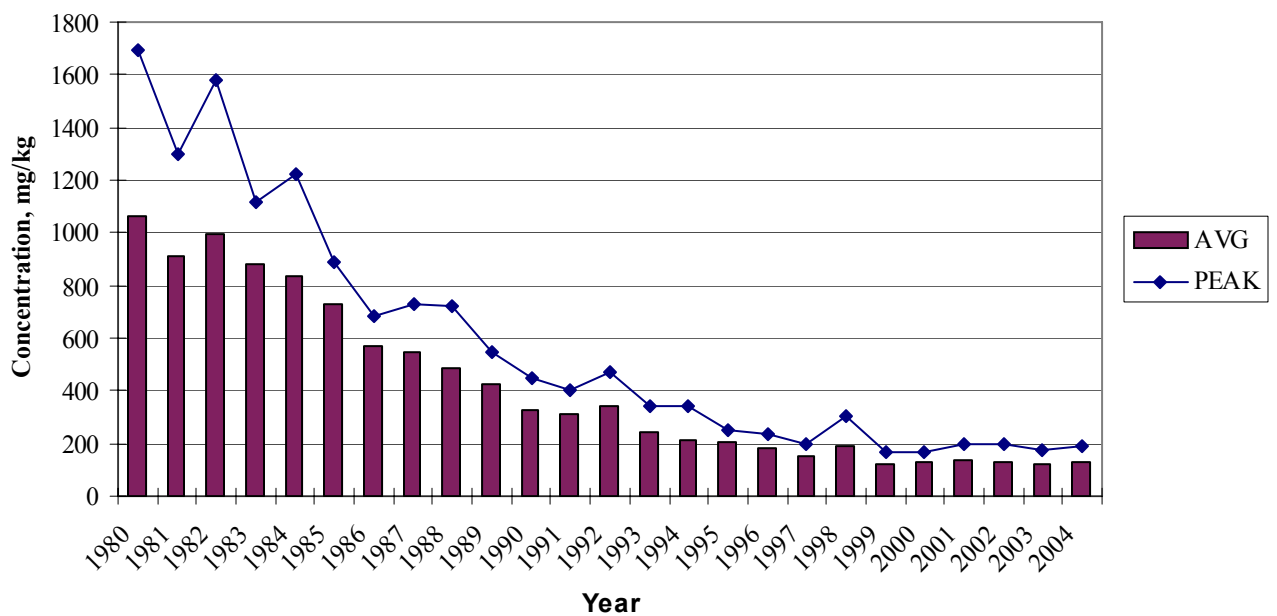
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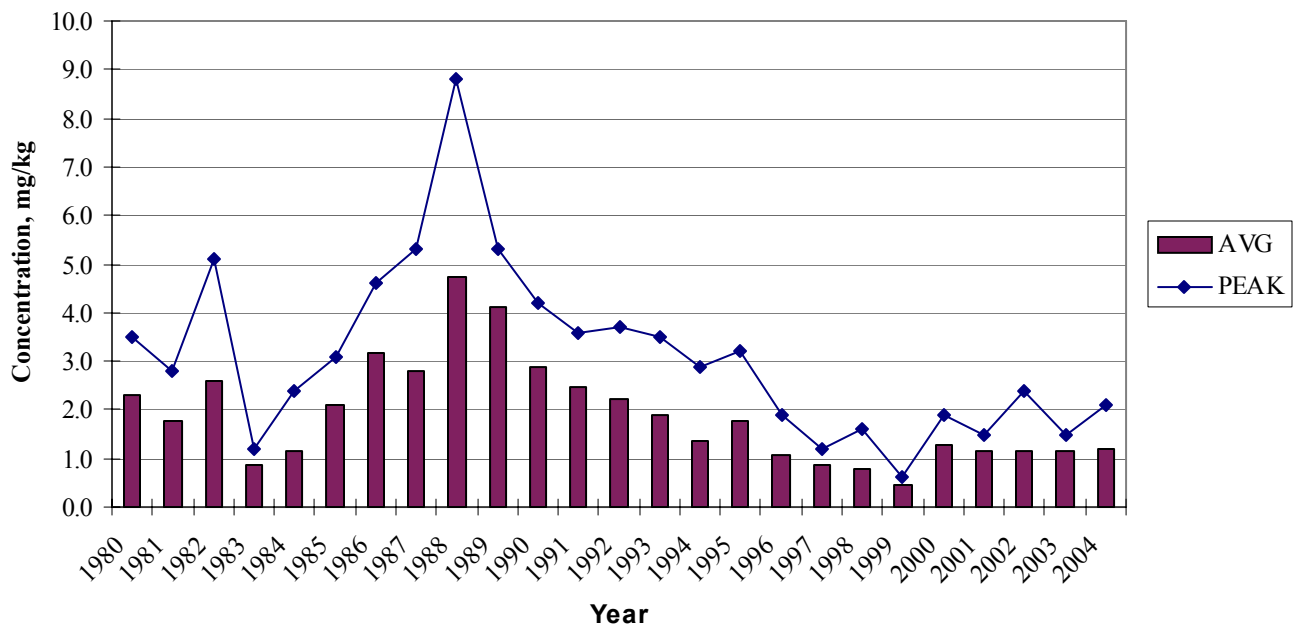
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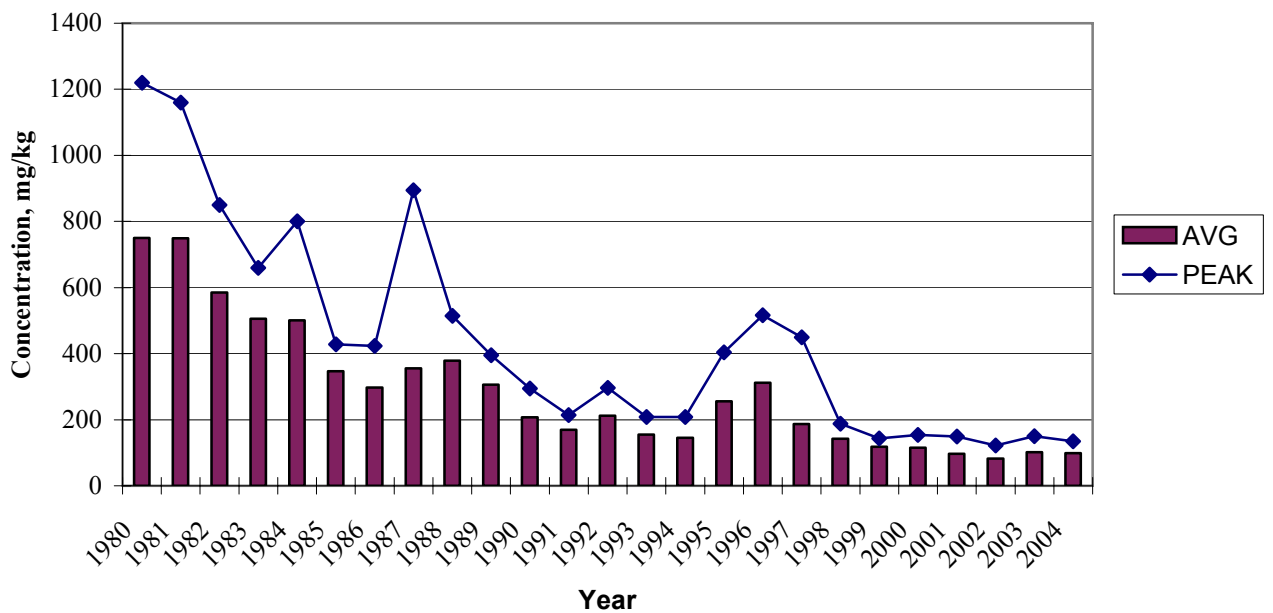
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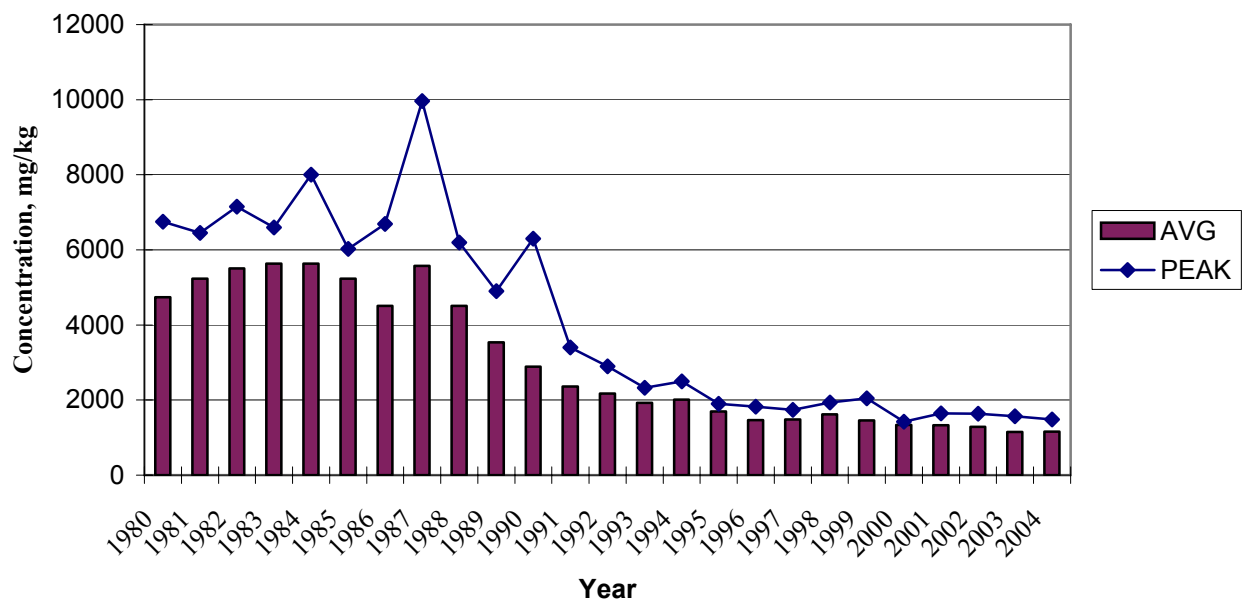
Southerly WWTC Biosolids-Mercury



Southerly WWTC Biosolids - Nickel

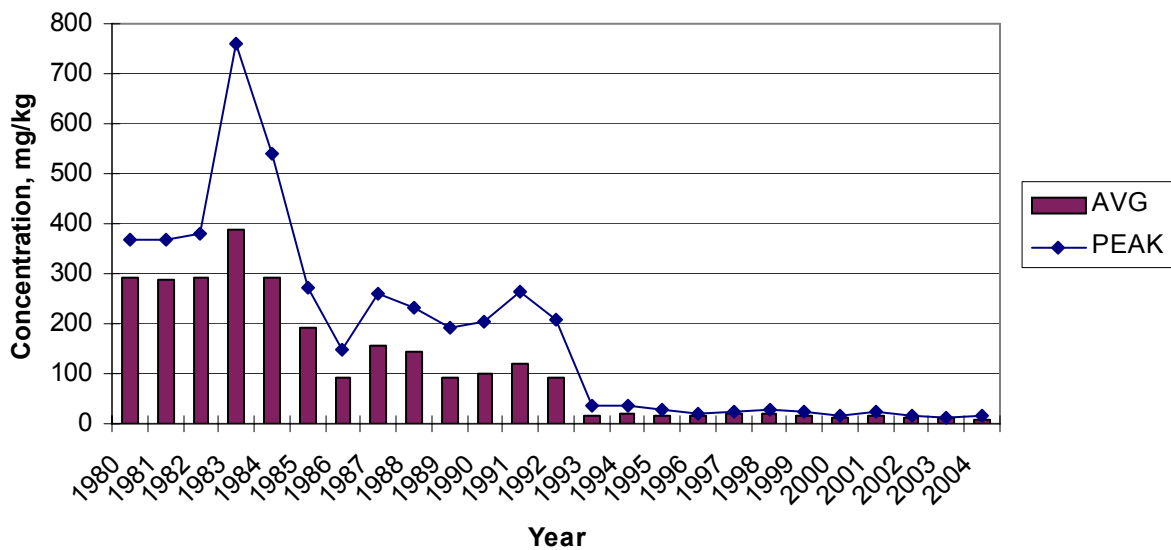


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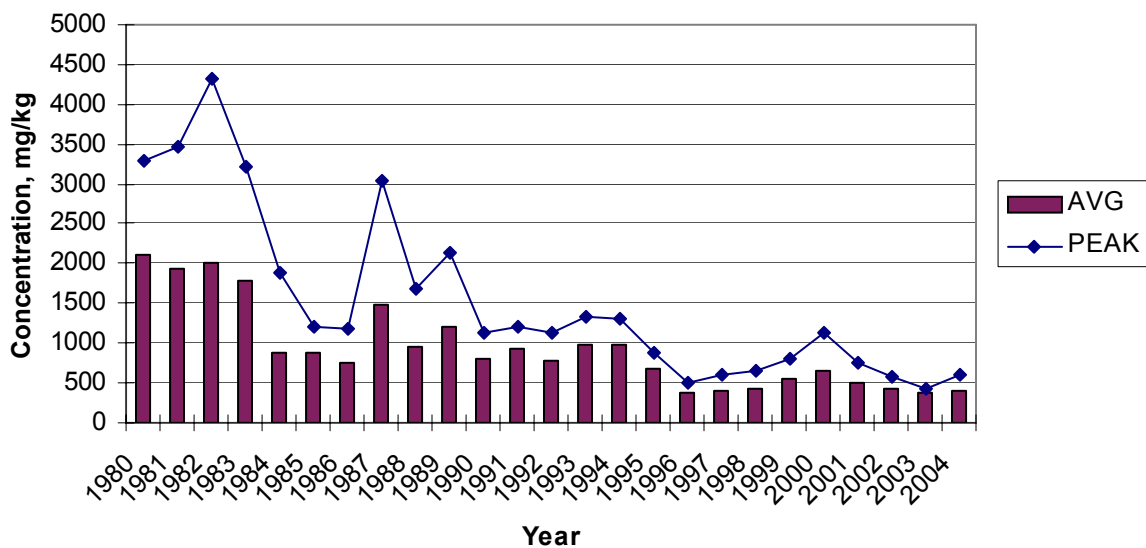


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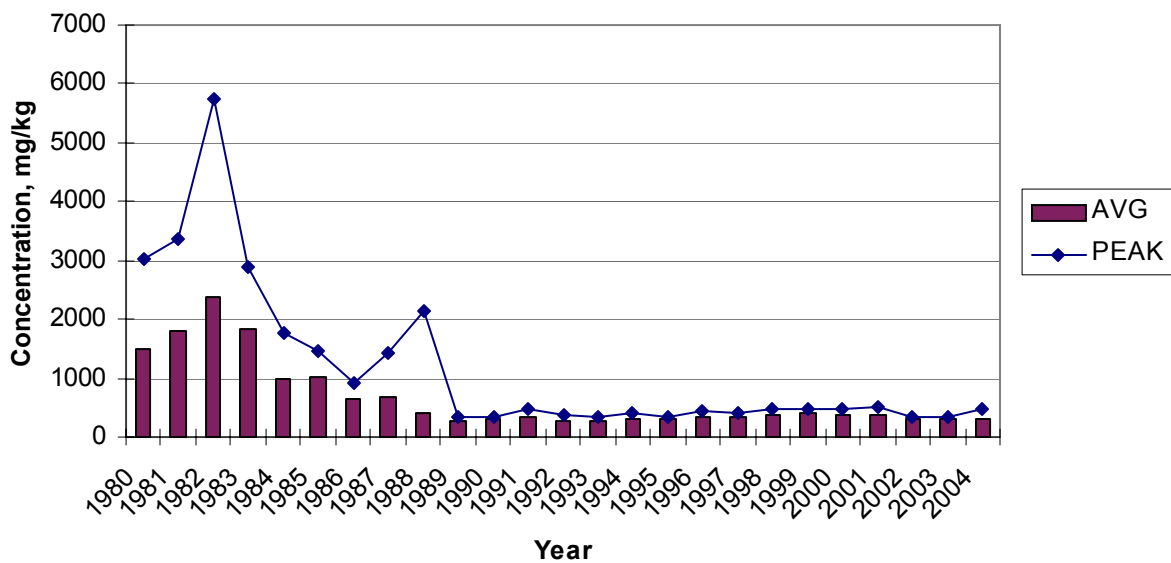
Westerly WWTP Biosolids - Cadmium



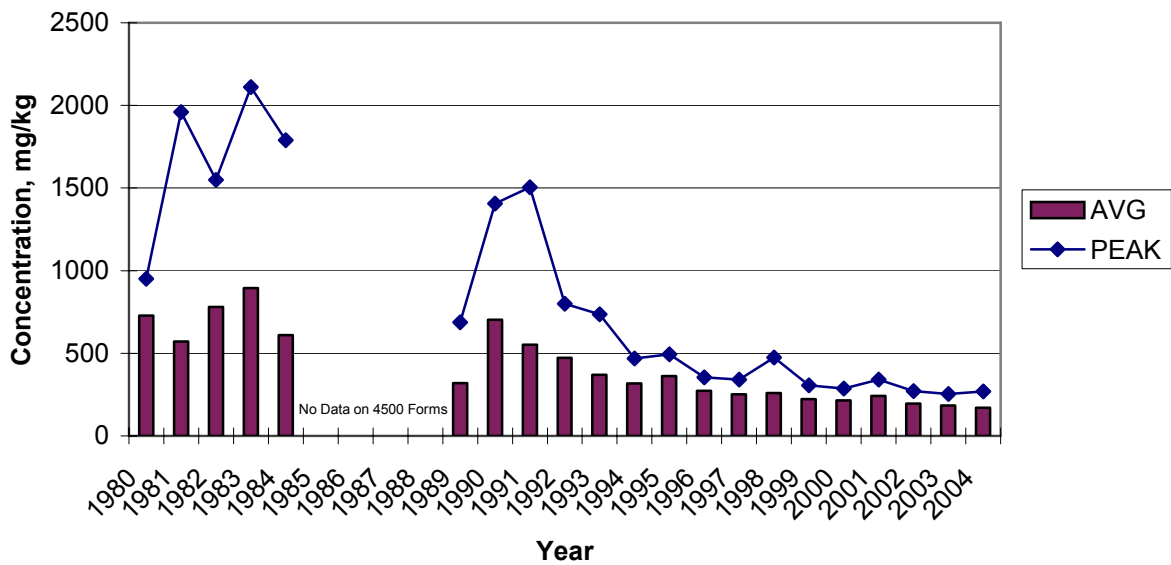
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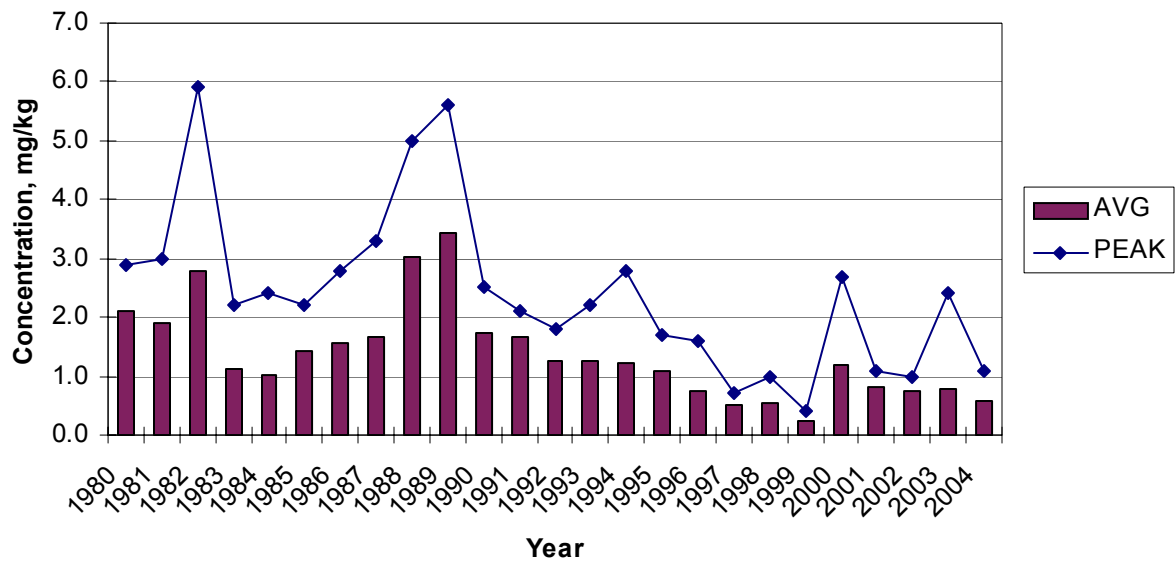
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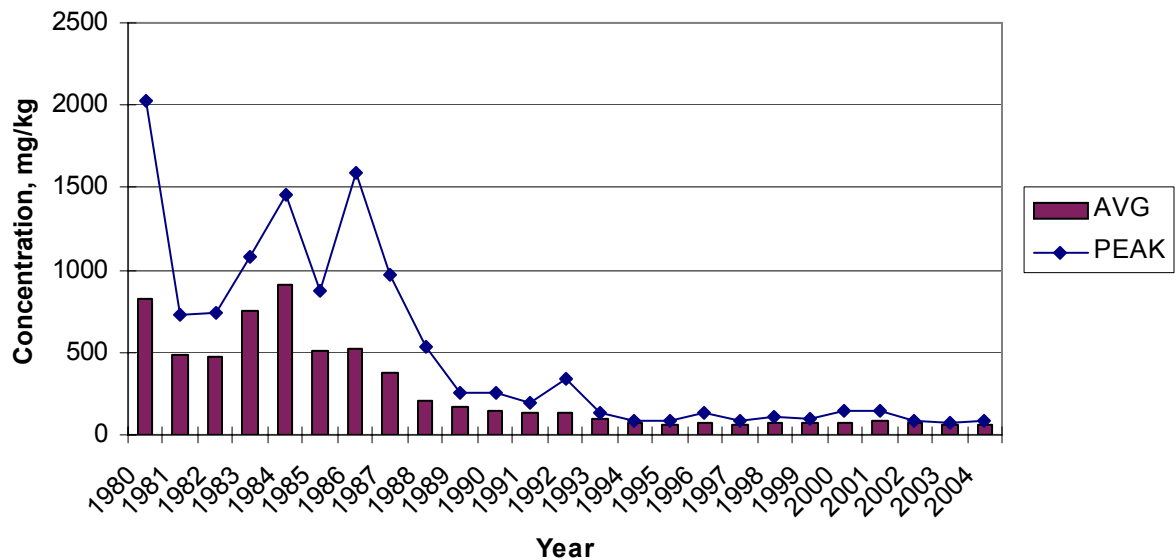
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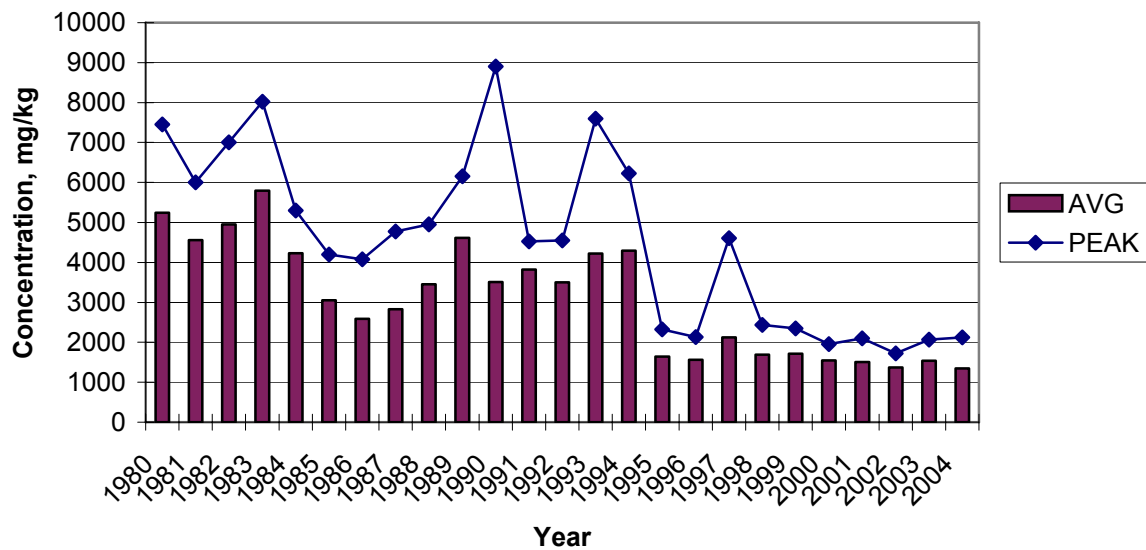
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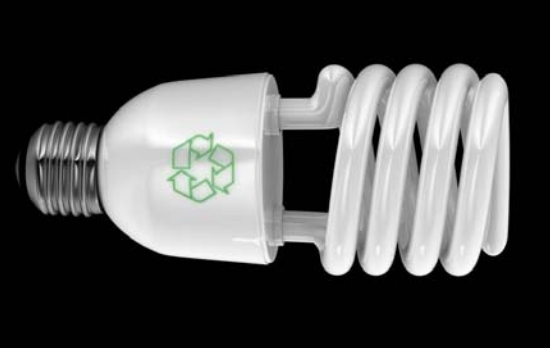


Westerly WWTP Biosolids - Nickel



Westerly WWTP Biosolids - Zinc





RENEWABLE ENERGY RESOURCES: Banking on Biosolids

NACWA
A Clear Commitment to America's Waters

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I. INTRODUCTION

Over the past decade, there has been increased interest in establishing national policies that promote renewable energy in the United States, as well as an increase in the development of renewable energy projects across the country. Recently, President Obama set a goal that the United States will obtain 10 percent of its electricity from renewable sources by 2012, rising to 25 percent by 2025. Congress is currently debating legislation that would require that up to 20 percent of electricity be generated by renewable energy sources by 2020.

This interest in renewable energy has been driven by a combination of fuel price spikes, climate change concerns, public awareness, and advancements in renewable energy technologies. Recent policies and project development efforts have been focused primarily on renewable energy sources derived from wind, solar, hydro-electric, geothermal, and biomass. With very few exceptions federal and state definitions of biomass do not include biosolids despite their widespread availability.

Biosolids and biogas derived from biosolids, however, should be considered renewable energy resources. The energy value from biosolids (the solid material derived from the process of treating wastewater) can be an important component of the country's renewable energy portfolio. Numerous technologies provide a means for wastewater utilities to reduce their energy consumption and recover energy by using biosolids. While these technologies are proven and available, broad application of the technologies is hindered by financial, technological, public perception and awareness, and legislative barriers.

As a nation, we must invest in emerging energy conversion technologies, and shift our cultural mindset to view biosolids as a viable energy resource rather than as a waste to be regulated. Changing past perceptions and increasing awareness of biosolids – what they are, the quality of the product, the energy recovery methods that can be employed, and the energy products that can be produced – is an important step towards sustainability and developing a portfolio of energy solutions for our nation's energy independence. Federal and state legislation should consider biosolids as a renewable energy source and should be adaptable so that the resulting policies and regulations can easily encompass new sources and technologies as they are developed.

This paper discusses the types of energy products that can be produced using biosolids; the technologies used to convert biosolids to energy use; the status of state law to create incentives for the use of biosolids as a renewable energy source; barriers to widespread adoption of these technologies and policies; and recommendations to promote greater use of biosolids as a sustainable, renewable energy resource for the United States.

II. BIOSOLIDS: A RESOURCE FOR SUSTAINABLE ENERGY

To make inroads towards sustainability and energy independence on a national scale, the federal government should create the conditions wherein wastewater treatment agencies can better seize the opportunity to capture biosolids energy and convert it to a marketable

The CHP Partnership estimates that 2.3 million metric tons of carbon dioxide emissions annually – equivalent to 430,000 cars – could be offset if existing wastewater treatment plants (with capacity over 5 million gallons per day [mgd]) that employ anaerobic digestion installed energy recovery facilities.

product. Facilities can capture biosolids energy using, in essence, the thermal and anaerobic digestion equipment and processes that may already exist onsite, or by employing additional processes designed to enhance energy production. Capturing this renewable energy available at wastewater treatment facilities translates into lower operational costs and reduced greenhouse gas emissions. The U.S. Environmental Protection Agency (EPA or Agency) instituted a program that seeks to reduce the environmental impact of electrical power production by

promoting the use of Combined Heat and Power (CHP) in different sectors, including municipal wastewater treatment plants. The CHP Partnership estimates that 2.3 million metric tons of carbon dioxide emissions annually – equivalent to 430,000 cars – could be offset if existing wastewater treatment plants (with capacity over 5 million gallons per day [mgd]) that employ anaerobic digestion installed energy recovery facilities.^{1,2} Harnessing the energy from biosolids offers energy security, a reduced dependence on fossil fuels, and lowered greenhouse gas emissions for our nation.

Ila. Biosolids – Organic Byproduct of Wastewater Treatment

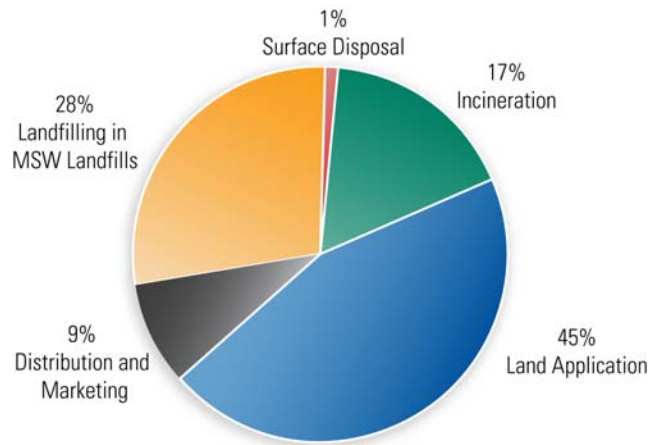
According to EPA, more than 16,500 publicly owned wastewater treatment works (POTWs) in the United States treat over 40 billion gallons of wastewater each day, generating over eight million dry tons of biosolids annually.³ For the purposes of this paper, biosolids are the primary and waste-activated organic matter (solids) that is removed from wastewater.

Biogas, an energy source derived from biosolids through the digestion process at wastewater treatment plants, is comprised of methane and carbon dioxide (CO₂). Biogas can be used for process heating, and can provide numerous other benefits when coupled with CHP systems, such as displacing fossil-fuels normally purchased for facility needs, increasing power reliability for the plant, and providing renewable fuel for green power programs. While biogas is a very broad term that can include biomass-derived gas, or gas from the anaerobic digestion of animal or food waste, the use of the term biogas in this paper refers to the gas derived from the wastewater anaerobic digestion process. Biosolids are

Biosolids are the primary and waste-activated organic matter (solids) removed from wastewater. Biogas, an energy source derived from biosolids through the digestion process at wastewater treatment plants, is composed of methane and carbon dioxide (CO₂).

managed by POTWs in a number of ways, including land application as fertilizer, distribution and marketing (includes pelletizing, composting, and soil amendment), incineration, landfilling, or surface disposal (Figure 1).

U.S. Biosolids Management Practices



"Biosolids Management: Options, Opportunities & Challenges", NACWA

Figure 1. U.S. Biosolids Management Practices

Appendix 1 provides an overview of biosolids management and the risk-based regulatory structure under which that management takes place.

IIb. Biosolids– An Alternative Energy Source

Unprocessed biosolids typically contain approximately 8,000 British thermal units per pound (Btu/lb) on a dry weight basis (2.3 kWh/lb), which is similar to the energy content of

1 pound of dry biosolids	8,000 Btu
1 kiloWatt hour of electricity	3,412 Btu
1 cubic foot of natural gas	1,028 Btu
1 cubic foot of biogas	600-700 Btu
1 cord of wood	20 million Btu

low-grade coal. A Btu is the most common unit used to measure the heat content of fuels, and represents the amount of energy required to raise the temperature of one pound of water by one degree Fahrenheit. The energy available from biosolids and

other energy sources is shown above. For comparison, the average daily residential energy use in the U.S. is 31 kWh per home⁴, which would require the energy equivalent of 13.4 lbs of biosolids.

The potential for energy recovery from biosolids is a function of their composition, which is a mixture of organic (volatile) matter, inorganic matter (inert material) and associated water. The composition of biosolids may vary, and the energy recovery method and corresponding energy products must be compatible with the characteristics of the biosolids. Fairly typical proportions of volatile organic matter and inert material in biosolids are shown in Figure 2.

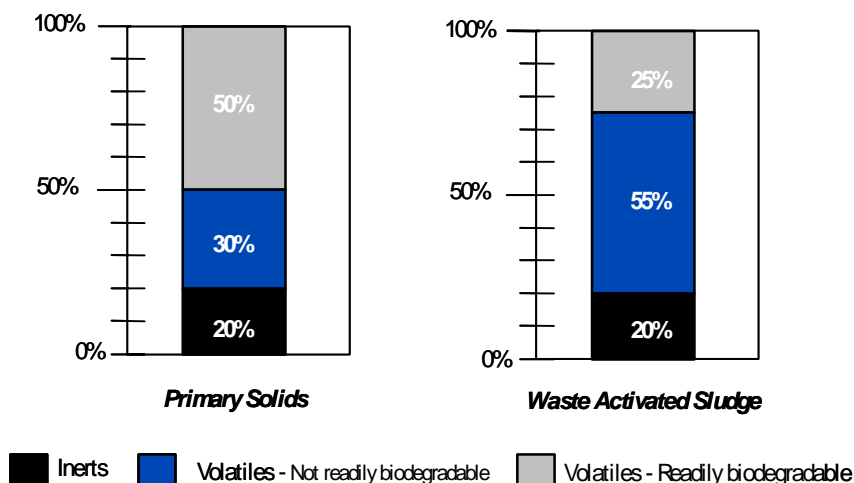


Figure 2. Composition of Raw Primary and Waste Activated Solids (Collectively Biosolids)

The energy content of biosolids is embedded in the volatile solids portion which, for the purpose of this discussion, is subdivided into two components: volatile organic matter that is readily biodegradable, and that which is not (this distinction will be discussed further in Section III). Although the composition of biosolids may vary from facility to facility, biosolids characteristics at individual POTWs are consistent, predictable, available, and sustainable. Additional refinements in process operating conditions and biosolids quality indicators will come to light as utilities continue to optimize their existing energy practices, and as technologies that harness the energy in biosolids advance.

III. BIOSOLIDS ENERGY RECOVERY METHODS – PROVEN, AVAILABLE, AND EMERGING

As the country evaluates alternative fuels, biosolids can be a viable fuel source burned in place of coal or other fossil fuel. Similarly, biogas, the methane product released when biosolids undergo anaerobic decomposition, can also be a replacement for fossil fuels. Energy recovery technologies at wastewater treatment plants are proven, and the number and variety of emerging recovery technology options are increasing dramatically. There are two primary energy pathways for energy recovery: *biodegradation* and *thermal conversion*. The potential for the recovery of energy and resources from wastewater biosolids is dictated by numerous drivers, such as the quality of, and markets for, the biosolids and energy products, as well as regulatory and public perceptions that influence the choice of recovery options. The characteristics of the end products of biodegradation and thermal conversion are significantly different. Thermal conversion oxidizes the organic matter in the biosolids, leaving behind only the inert (ash) fraction. Anaerobic digestion consumes the majority of the readily biodegradable organics in the biosolids, but leaves a larger mass/volume of biosolids for use or disposal. An overview of the various biosolids and energy products from the biodegradation and thermal conversion pathways, along with the corresponding energy recovery technologies, are shown in Figure 3.

	Treatment Process	Energy Product	Energy Use	Biosolids Product	End Uses
Biodegradation	Anaerobic Digestion	• Biogas	• Process Heat	• Class B Cake	• Land Application • Land Reclamation
		• Fuel Gas	• Power Generation • Vehicle Use or Natural Gas Replacement		
Thermal Conversion	Incineration Co-Combustion	• Heat	• Process Heat • Power Generation	• Ash	• Landfill
	Thermal Drying – Gasification	• Syngas • Fuel Gas	• Process Heat • Power Generation • Vehicle Use or Natural Gas Replacement	• Ash	• Landfill
	Pyrolysis – Thermal Drying	• Bio-oil • Dried Fuel	• Process Heat • Alternative Fuel		
	Thermal Drying (alone or in combination with above)	N/A	N/A	• Dried Biosolids	• Land Application • Land Reclamation • Distribution & Marketing • Alternative Fuel

Figure 3. Biosolids Energy Pathways, Processes, and Products

IIIa. Energy Recovery Pathway – Biodegradation and Biogas Generation

Anaerobic Digestion

Anaerobic digestion is one of the most widely used solids processing technologies. In anaerobic digestion, only the readily biodegradable portion of the volatile solids in biosolids is decomposed by microorganisms in the absence of oxygen, which produces biogas (refer to Figure 2). The gas is primarily composed of methane (60-65 percent) and CO₂ (30-40 percent). Biogas is a valuable resource that has been used traditionally to heat the digesters and, at many treatment facilities, to generate power. Biogas is an opportunity fuel, meaning gas generation requires no additional cost if the anaerobic digester used to produce the gas is already in place. Biogas can be collected and converted to electricity using onsite power generation equipment. Additionally, heat can be recovered from the power generation units in the form of hot water or steam (combustion turbines only) to heat the digesters,

facility buildings, or other processes that require heat. Overall efficiency of gas utilization can approach 75 to 80 percent if all of the recovered heat is used.

Power generation from biogas has widespread use at treatment plants, especially in areas with high electric rates, such as in California and the northeastern U.S. Large plants can generate significant power. As an example, the Orange County Sanitation District in California treats a flow of 213 mgd and generates 9.3 megawatts (MW) of power using biogas. At an average plant flow of 130 mgd, the Metro Wastewater Reclamation District in Denver, Colorado, generates up to 5 MW supplying 40 percent of the treatment plant's total electrical needs.



The opportunity for CHP exists when a wastewater treatment plant employs anaerobic digestion. The biogas that flows from the digester can be used as fuel to generate electrical power using engine generators, turbines, or fuel cells. The heat generated during the power production process can be used for building heating or cooling, or in the treatment process itself. An analysis completed by the CHP Partnership found that if CHP were installed at all 544 wastewater treatment facilities in the U.S. (facilities that have influent flow rates greater than 5 mgd and that operate anaerobic digesters), then approximately 340 MW (340,000 kilowatt hours) of electricity could be generated – enough to power 261,000 homes.^{5,6}

In California, 59 percent of plants with flows greater than 38 ML/d (10 mgd) recover biogas.

Biogas collection and use technologies have steadily improved over the years, and energy recovery from biogas is now regarded as one of the more mature and successful waste-to-energy technologies. Unlike thermal conversion technologies, anaerobic digestion is economically viable even for small- to medium-scale wastewater treatment facilities. Typically, anaerobic digestion is a good fit for plants that include primary clarification, which is common in plants larger than 5 to 10 mgd.

Anaerobic Digestion with Pretreatment

The desire to improve the sustainability of their operations has also led a number of wastewater utilities to explore options to increase biogas generation from their anaerobic digesters. There is growing interest in several emerging technologies that are focused on improving the digestibility of waste activated sludge (WAS), by breaking open, or lysing, the bacterial cells, making them more amenable to conventional digestion. Cell lysing technologies include thermal hydrolysis, mechanical disintegration and electrical pulse treatment. While no facilities in the U.S. use thermal hydrolysis or mechanical disintegration, more than 30 installations in Europe have implemented these processes. Based on the limited experience to date, it appears that WAS pretreatment has the potential to more than double the readily biodegradable fraction in WAS, resulting in improved volatile solids reduction and gas production in the digesters. The resulting biogas production can be 30 to 60 percent greater than without pretreatment. Enhanced

Pretreatment can potentially increase biogas production by about 30-60 percent.

volatile solids reduction in the digesters also translates to decreased quantities of stabilized biosolids to manage. While not strictly digestion pre-treatment, another option to increase biogas production is to add several feedstocks to biosolids (known as co-digestion). The most commonly used feedstock is fats, oils and grease wastes (obtained mainly from restaurants and local food preparation plants). This practice can increase biogas production by as much as 30 percent.

IIIb. Energy Recovery Pathway – Thermal Conversion

Biomass thermal conversion technologies, such as incineration, gasification, and pyrolysis, are shown in Figure 4. The entire volatile fraction of the biosolids is either completely or partially oxidized during the thermal conversion energy pathway (refer to Figure 2 for both the “readily biodegradable” and the “not readily biodegradable” fractions). Energy can be recovered from the heat liberated during the oxidation or, in some technology versions, from gaseous or carbon-based solid residue end-products.

Incineration is a well-established thermal conversion technology for biosolids processing. Several other thermal technologies, such as gasification and pyrolysis, are becoming more viable as methods for biosolids energy recovery. Most thermal conversion technologies have a minimum solids production threshold of approximately 50 dry tons per day to be economically viable. While thermal conversion processes have traditionally occurred at the POTW site, biosolids can be dried and transported to off-site facilities, such as power plants or cement kilns, to be combusted in place of coal or to augment coal use.

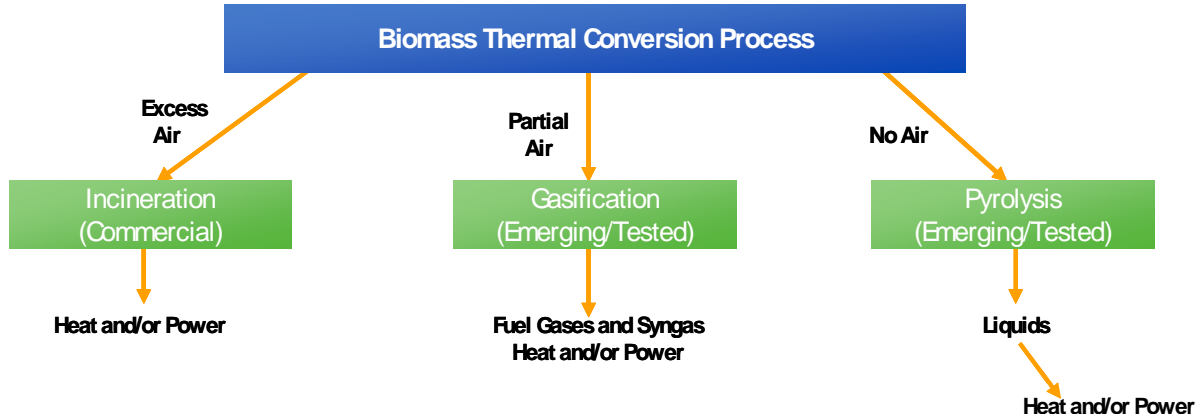


Figure 4. Biomass Thermal Conversion Technologies

Incineration

Incineration of biosolids is the most common thermal process; however, its potential for energy recovery is underused. In this process, the biosolids are burned in a combustion chamber supplied with excess air (oxygen) to form mainly carbon dioxide (CO₂) and water (H₂O), leaving only inert material (ash). Emissions are treated to remove pollutants and meet the requirements set forth by applicable federal and state regulations. Heat can be recovered from the off-gas and can be used for process heat or to generate power using

steam turbines. The incineration process with energy recovery (illustrated using a fluidized bed incinerator (FBI), one of the major types of biosolids incinerators) is shown in Figure 5.

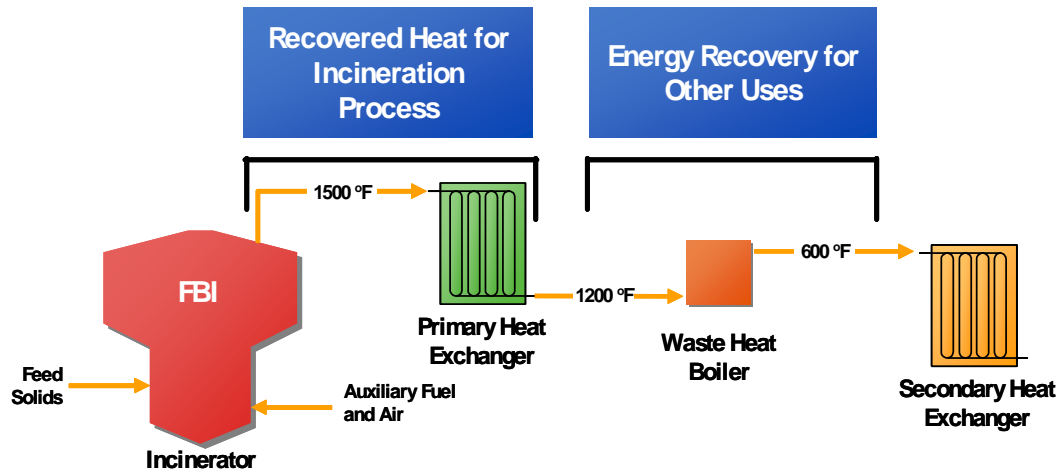


Figure 5. Fluidized Bed Incineration (FBI) Process with Energy Recovery

In addition to onsite incineration processes, dried biosolids are also suitable for co-firing in power plants that use coal or biomass (at about 5 to 20 percent of a plant's fuel input), with limited modification to the power plants.

Incineration with power generation has been successfully implemented by the Metro Wastewater Treatment Plant in St. Paul, Minnesota. The plant has a 3.5 MW generation capacity, which reportedly reduces the plant's greenhouse gas emissions by approximately 18 percent on average.⁷ A number of other incineration facilities — including the Northeast Ohio Regional Sewer District's Southerly Plant in Cleveland, Ohio, and the Water Pollution Control Facility in Hartford, Connecticut — are in design to implement power recovery with expected generation capacities of 2.0 and 0.8 MW, which will provide 20 percent and 40 percent of the facilities' energy needs, respectively.

Gasification

Gasification, a relatively new technology, involves the chemical reaction of carbon in the volatile organic fraction of biosolids with air, oxygen, steam, carbon dioxide, or a mixture of these gases at elevated temperatures (500-1400 °F). The products of the process include heat (which can be used to generate power and process heat) and syngas (synthetic gas). In contrast to combustion processes (incineration) that work with excess air, gasification processes operate at oxygen-starved conditions, with only enough oxygen added to generate heat to drive the chemical reactions. The gasification process is shown in Figure 6.

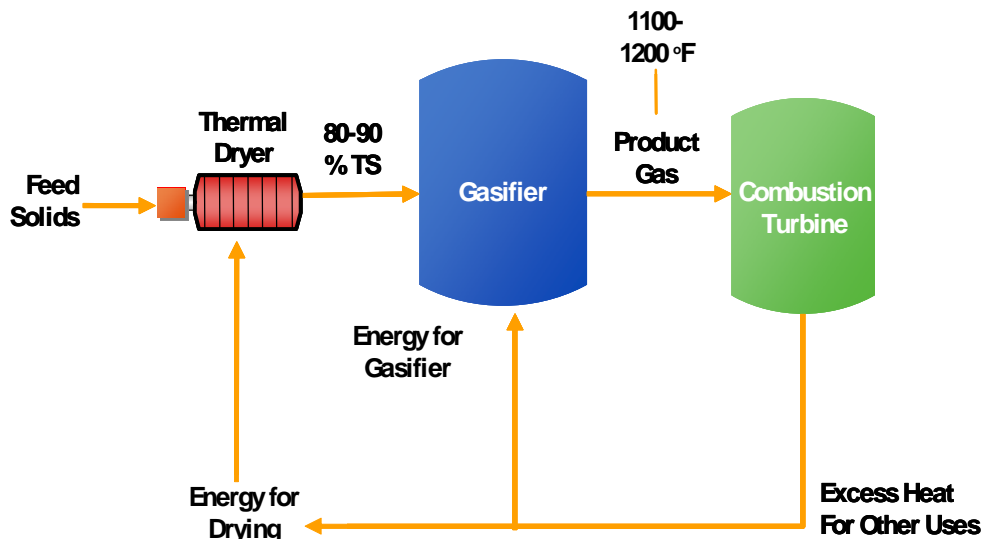


Figure 6. Gasification Process with Energy Recovery

The chemical composition of the end products and the energy content are affected by the gasification agent (air, oxygen, or steam), the gasifier operating temperature and pressure, and feed characteristics (type, dry solids, and volatile solids). An example of the gases generated and the potential uses are shown below:

Energy Type	Energy as a Percentage of Natural Gas	Use
Low energy gas	10-27	Gas turbine fuel, boiler fuel
Medium and high energy gas	27-94	Hydrogen production, fuel cell feed, chemical and fuel synthesis
Substitute natural gas	>94	Directly substitute for natural gas with no additional treatment

Dry material, such as wood or green waste, can be co-mingled with the biosolids to meet the required energy characteristics. Alternatively, the system may include a thermal drying step upstream to facilitate target feed solids concentration, and a portion of the energy from the gasification process can be used to dry the feed material.

At this time, a gasification facility for biosolids treatment is operating in Sanford, Florida, and a demonstration system is under construction in Stamford, Connecticut. Biosolids gasification is expected to result in significant energy recovery, but these types of systems are still in the early stages of implementation and will need to be proven over time.

Pyrolysis

Pyrolysis uses high pressure and temperature in the absence of oxygen to decompose the organic material in biosolids into gas, liquid (bio-oil), or char, which is a combustible carbon-

based material formed by the incomplete combustion of organic material. There are two categories of pyrolysis: slow pyrolysis and fast pyrolysis. Slow pyrolysis does not produce bio-oil, whereas fast pyrolysis does. Pyrolysis typically occurs at temperatures lower than incineration or gasification.

A single commercial application of the pyrolysis process currently in use is the SlurryCarb™ installation in California. It operates at a temperature of about 840°F. The reaction, which is controlled just short of pyrolysis, alters the molecular structure of the solids and releases CO₂, thus reducing the mass of the solids by approximately 40 percent. The resulting “carbonized” solids are made into a slurry that is thermally dried and pelletized to a solid fuel, called E-fuel, which can be combusted directly in pulverized coal boilers, gasifiers, fluidized bed incinerators, or used off-site as an alternative fuel. While pyrolysis has limited application to date, the potential energy recovery is promising. Projected energy balances of the California installation indicate a net energy production of 2,100 kWh/ton dry solids.⁸

Bio-oil, a product of the pyrolysis technology, can be used to produce thermal energy for industrial processes and to heat buildings and water.

IIIc. Opportunities for Energy Recovery Are Hindered

The lack of financial incentives and support at the federal level represents the largest impediment to broad and supported application of biosolids and biogas energy recovery technology. While the technologies available for energy recovery from biosolids are rapidly advancing, only a few full-scale installations of many of the thermal conversion-related options are operational. Because the process efficiencies, energy losses, and site-specific conditions vary, owners of POTWs, as stewards of public monies, are often understandably reluctant to implement emerging technologies without predictable results. Further, biosolids technologies are classified differently from state to state, which impedes progress because POTWs must meet permitting requirements that can vary from state to state and region to region.

These technologies have gained interest in some parts of the country, most notably in locations with high purchased electrical rates. Outside of these areas, however, utilities are not driven by the same forces, and are consequently less aware of, and motivated to, implement technologies that generate renewable energy and reduce greenhouse gas emissions.

Financial and Technological Impediments and Actions

Providing wastewater services requires substantial energy at a high cost to utilities, but utilities that use biosolids digestion and incineration lack financial incentives to invest in expensive new facilities that would enhance the self-generation of energy and reduce the need for purchased energy. According to NACWA’s *2008 Financial Survey*, operation and maintenance accounts for, on average, 41 percent of a utility’s total expenditures, with electricity costs composing an average of over 10 percent of the total costs.⁹ From 2004 to 2007, electricity costs per million gallons treated rose 32 percent,¹⁰ and the average electricity cost is now \$166 per million gallons treated. A small percentage of wastewater treatment plants in the United States already tap the energy embedded in biosolids; the vast majority, however, do not. According to EPA, there are several hundred wastewater treatment plants in the U.S. that have

anaerobic digestion capabilities. Despite the onsite technology to capture and use digester gas, only a small percentage of these plants use digester gas for heating or electricity generation.¹¹

In addition to beneficial use of biogas, some POTWs use thermal conversion technologies to capture and reuse the excess process heat. For example, utilities are able to reduce their external energy consumption and energy footprints by turning the excess heat from incinerator exhaust gases into high pressure steam that is then used in plant processes and to comfortably heat buildings. Although some POTWs may co-generate electricity to maximize recovery from biosolids, older operating facilities exist that were not originally designed and constructed to recover energy, and thus require upgrades.

Biosolids represent a wellspring of potential energy, and yet current renewable energy practices and policies preclude the ability to fully recover the energy inherent in biosolids and reap the associated benefits of reduced greenhouse gases.

To alleviate financial impediments, a clear framework that renders energy derived from biosolids eligible for premium pricing would drive new applications of conventional technologies, as well as spur deployment of emerging technologies. POTW owners that are reluctant to implement technologies with little full-scale operating and cost history would benefit from financial incentives. Increased availability of grants or other financial incentives for large-scale trials and implementation would expand the experience base, increase understanding and awareness, and reduce the risk associated with newer technologies. At the same time, standardizing definitions and permitting requirements from state to state would reduce the risk and the cost of implementing newer technologies.

In 2007, 222,115 thousand kilowatt hours of electricity were generated in the U.S. using biosolids.

Perception and Awareness Impediments and Actions

Even in regions with heightened awareness of many types of renewable energy and sustainability processes, biosolids technologies are not viewed as favorably as other renewable technologies. Biosolids technologies are not generally considered “advanced” or “low-emission” technologies.

Perception and awareness of biosolids energy recovery technologies and applications can be increased through public outreach, industry-based education, and incentive programs. Some wastewater treatment industry organizations have initiated actions to gain an understanding of awareness impediments. As an example, the Water Environment Research Foundation (WERF) is planning to research impediments to generating energy from biogas, including gathering input from POTW focus groups. However, WERF has limited funds and many competing research requirements. Additional grants for renewable energy project implementation and funding for research would significantly increase the production of renewable energy and decrease greenhouse gas emissions.

IV. BIOSOLIDS IN RENEWABLE ENERGY POLICY

IVa. Current Legislation on Renewable Energy

Recent federal and state policies have been focused on primarily renewable energy sources derived from wind, solar, hydro-electric, geothermal, and biomass as solutions to the country's future energy needs. These policies define the resources and technologies that may qualify as a renewable resource for Renewable Energy Portfolio Standards (REPS). Additional revenue streams as well as special incentives and funding are available to projects that meet the REPS eligibility requirements.

In general, a REPS is a goal for electric utilities to obtain a certain amount of renewable energy to serve their customers. In order to achieve these goals, utilities often pay a premium to renewable energy producers for their energy or purchase Renewable Energy Certificates (REC) from producers to demonstrate compliance with the REPS. RECs—also known as green certificates, green tags, or tradable renewable certificates—represent the environmental attributes of the power produced from renewable energy projects and are

Wastewater biogas and biosolids are often overlooked as a potential renewable energy option in current policies despite their availability and energy value. Biosolids should be a renewable biomass fuel.

sold separately from commodity electricity. Currently, 29 states and Washington, D.C., have enacted such standards for their utilities. This additional revenue helps support renewable energy project development.

Wastewater biogas and biosolids are often overlooked as a potential renewable energy option in current policies, however, despite their availability and energy value. Biosolids should be a renewable biomass fuel, but have not been identified as such under various federal energy policies (such as the *American Recovery and Reinvestment Act* [ARRA] and the Federal Renewable Portfolio Standard and Carbon Cap-and-Trade) or in the majority of the State Renewable Portfolio Standards (RPS).

Under 26 USC §45 (Internal Revenue code, as amended by the ARRA), open-loop woody biomass is designated as a qualifying renewable energy resource. This classification of biomass often refers to wood byproducts or wastes that did not necessarily originate from a regenerating, managed forestry program. Thus, there are concerns regarding the sustainability of these resources over time and the emissions related to transporting the fuel. Nevertheless, the nation's policymakers have accepted open-loop biomass as renewable. By comparison, the supply of biosolids is consistent, predictable, and sustainable, and yet, biosolids continue to be omitted or not explicitly included in the energy dialogue of the nation.

These legislative omissions limit subsidies and financial incentives that the federal and state governments can provide to POTWs. The ambiguous definitions that guide the federal and state programs and policies surrounding renewable energy are discussed below.

American Recovery and Reinvestment Act (ARRA): The ARRA provides for a number of lucrative incentives to advance implementation of renewable technologies. Under the ARRA definition, many types of resources qualify for renewable energy incentives such as bonds, grants, and tax credits. Several 26 USC §45 definitions are often referenced in these federal incentive programs in specifying what are qualified “renewable resources.” Unfortunately, the definitions pertaining to bioenergy resources do not directly address the definition for biosolids, biogas derived from other sources or wastewater treatment process (WWTP) biogas.¹²

Overall, whether biosolids and biogas generated from biosolids at POTWs are eligible for ARRA or other federal incentives remains ambiguous. At a minimum, the role of biosolids should be clarified under 26 USC §45.

Federal Renewable Energy Portfolio Standard: Implementation of a national renewable portfolio standard is nearing, yet the role of biosolids in these programs remains unclear. Under H.R. 2454, the *American Clean Energy and Security Act of 2009* (passed in the House in June, 2009), there are a number of categories that could support discussion of biosolids; however, biosolids are not directly addressed in the language, except in the case of “wastewater treatment gas”.¹³

While animal waste and byproducts are clearly defined as a “renewable biomass”, biosolids – which have similar characteristics – do not qualify for the same designation, even though biosolids can play a similar role in the country’s energy portfolio. Instead, in this piece of important legislation, biosolids remain ambiguously defined.

State Renewable Energy Portfolio Standards (REPS). While the federal government is still contemplating a national renewable energy standard and carbon cap-and-trade programs, a majority of states have already moved forward in setting renewable energy targets. Some of these states are aware of biosolids’ potential and either include biosolids and digester gas explicitly in their legislation, or allow biosolids to qualify for the state’s REPS program.

- *Colorado REPS Biomass Definition:*
“Biomass” means nontoxic plant matter consisting of agricultural crops or their byproducts, urban wood waste, mill residue, slash, or brush; animal wastes and products of animal wastes; or methane produced at landfills or as a by-product of the treatment of wastewater residuals.
- *Florida Draft REPS Definition:*
“Biomass,” means a power source that is comprised of, but not limited to, combustible residues or gases from forest products manufacturing, waste, or co-products from agricultural and orchard crops, waste or co-products from livestock and poultry operations, waste or byproducts from food processing, urban wood waste, municipal solid waste, municipal liquid waste treatment operations, and landfill gas.
- *Massachusetts REPS Definition:*
“Eligible liquid biofuel” is further defined as a liquid fuel “that is derived from

eligible biomass fuel and that yields at least a 50 percent reduction in lifecycle greenhouse gas emissions relative to average lifecycle greenhouse gas emissions for petroleum distillate fuel...; or that is derived from waste feedstocks consisting of previously used or discarded...material resulting from...food service activities...Waste feedstock shall include, but not be limited to, waste vegetable oils, waste animal fats, substances derived from wastewater and the treatment of wastewater, or grease trap waste...”

- *California REPS Definition:*
“Biomass” is defined as any organic material not derived from fossil fuels, including agricultural crops, agricultural wastes and residues, waste pallets, crates, dunnage, manufacturing, construction wood wastes, landscape and right-of-way tree trimmings, mill residues that result from milling lumber, rangeland maintenance residues, biosolids, sludge derived from organic matter, and wood and wood waste from timbering operations.

IVb. Legislation to Advance Renewable Energy

As a first step towards drafting legislation that defines biosolids as a renewable energy, legislators need to determine where biosolids would be addressed. Biosolids should be considered a “Renewable Biomass.” The energy inherent in the biosolids products should be considered a biomass and a “renewable” energy source.

Using state REPS language as a starting point, legislators should broadly define biosolids and biosolids energy products to include current and emerging products; that is, the definition should include all energy-containing products deriving from wastewater treatment, such as residual solids, biogas, heat dried residuals, and products of energy-conversion technologies such as gasification and pyrolysis.

V. Conclusions

Wastewater treatment plants — and more broadly, the United States — have a vested interest in embracing renewable energy from biosolids. Renewable energy goals established by President Obama shine a light on technologies that establish sustainable, attainable energy recovery from biosolids. Wastewater treatment plants are primed to capitalize on available technologies. While biosolids represent a powerful energy option, energy recovery from biosolids is not without its challenges, as summarized below:

- Technological
 - Limited U.S. experience with thermal conversion-related technologies
 - Variations in permitting requirements and restrictions by state
- Financial
 - Lack of financial incentives and support
 - Limited support or implementation of premium pricing for biosolids-derived energy
 - Little full-scale operating and cost history for thermal conversion-related technologies other than incineration

- Legislative
 - Wastewater biogas and biosolids are often overlooked as a potential renewable energy option in these policies
 - Biosolids should be a renewable biomass fuel, but have not been identified as such under various federal energy policies
 - Definitions that guide the federal and state programs and policies surrounding renewable energy are inconsistent and ambiguous
- Public Perception and Awareness
 - Biosolids technologies are not viewed as favorably as other renewable technologies
 - Some utilities are less aware of and motivated to implement technologies that generate renewable energy and reduce greenhouse gas emissions

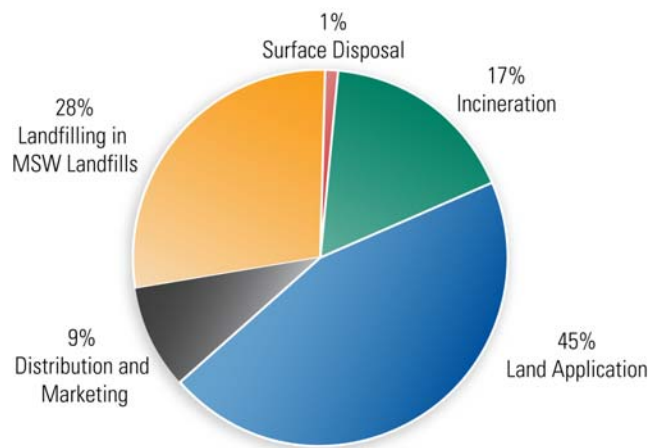
Broad-scale sustainability and energy stability are inextricably linked to legislation that recognizes and supports technological advances; innovative technology that facilitates renewable energy sources; and operator desire to apply the technology. The current impediments—technological, financial legislative, and public perception and awareness—can all be overcome. However, the speed at which we progress is influenced greatly by the actions of and policies established by federal, state, and local governments, as well as by the availability of financial incentives to encourage publicly-owned utilities to implement new technologies.

Renewable energy projects can be capital-intensive, and the decision to pursue such an option is often driven largely by nearer-term economics. Even accounting for the economic benefits of fuel/electricity displacement and carbon hedge, the payback period may be longer than some utility owners need to justify this type of capital investment. Thus, additional incentives are needed to spur more widespread development and deployment of CHP and other types of biosolids energy recovery projects. Such incentives are potentially available in the form of lower cost financing, grants, tax credits, and/or additional revenue sources provided by various “renewable energy” policy initiatives of the federal and state governments. Herein lays the importance of gaining recognition of biosolids as a renewable energy resource.

Appendix 1

Biosolids are managed by POTWs in a number of ways, including land application as fertilizer, distribution and marketing (includes pelletizing, composting, and soil amendment), incineration, landfilling, or surface disposal.

U.S. Biosolids Management Practices



"Biosolids Management: Options, Opportunities & Challenges", NACWA

Based on statutory requirements under the Clean Water Act and key regulatory provisions in 40 CFR Part 257, biosolids production and use are governed by health-based standards set forth in 40 CFR Part 503 and by state and local laws. With the initiation of the EPA's pretreatment regulations in the early 1980s, and subsequent federal biosolids regulations, the quality of biosolids has improved, as reported in EPA's Targeted National Sewage Sludge Survey.¹⁴ A 40-City Study (conducted in 1979 and 1980), examined the biosolids generated at 40 POTWs; the National Sewage Sludge Survey (conducted in 1989) summarizes testing conducted at over 200 wastewater treatment facilities. Both surveys showed that, in almost every case, concentrations for regulated metals decreased during the 1980s.¹⁵

More recent data compiled by the National Association of Clean Water Agencies (NACWA) show a continued trend of reduced concentrations of metals in municipal biosolids. For example, the Northeast Ohio Regional Sewer District (District) documents a substantial reduction in metal concentrations in its influent, effluent, biosolids, and incinerator exhaust gases. To assess the impact of the District's pretreatment program, the concentration trends for metals (cadmium, chromium, copper, lead, nickel, and zinc) were analyzed from 1980 to 2004. Since the inception of the pretreatment program at the District, metals have had a continued downward trend in treatment plant influents and effluents.¹⁶ Similar improvements in biosolids quality have been documented at other wastewater treatment plants, including the Hyperion Treatment Plant in Los Angeles, California. Improvements such as these demonstrate the success of pretreatment programs

in the U.S. and the need for a national strategy to maximize energy recovery and reuse at the Nation's POTWs.

Endnotes

¹ EPA established the Combined Heat and Power (CHP) Partnership in 2001 to encourage cost-effective CHP projects in the United States. The CHP Partnership is a voluntary program that promotes high-efficiency CHP technology, thereby reducing pollution created by less-efficient, large-scale utilities.

The CHP Partnership promotes CHP by fostering cooperative relationships with the CHP industry, state and local governments, and other relevant stakeholders.

² United States Environmental Protection Agency (USEPA), Combined Heat and Power Partnership, Opportunities for and Benefits of Combined Heat and Power at Wastewater Treatment Facilities. Page iii. (2006).

³ USEPA, Office of Wastewater Management, Emerging Technologies for Biosolids Management, EPA 832-R-06-05, Page 1-1. (2006).

⁴ U.S. Energy Information Administration, Independent Statistics and Analysis, Table 5, http://tonto.eia.doe.gov/ask/electricity_faqs.asp#electricity_use_home (2007).

⁵ USEPA, CHP Manual, 2006.

⁶ U.S. Energy Information Administration, 2007.

⁷ Burrowes, P.; Borghesi, J.; Quast, D. The Twin Cities Sludge-to-Energy plant reduces greenhouse gas emissions, *WEFTEC Conference Proceedings*, San Diego, CA (2007).

⁸ Kearney, R.; Bolin, K., The new SlurryCarb process under construction in Rialto, CA will convert biosolids to a renewable fuel, *WEF Residuals and Biosolids Conference Proceedings*, Philadelphia, PA (2008).

⁹ NACWA, 2008 Financial Survey, A National Survey of Municipal Wastewater Management Financing and Trends (2008).

¹⁰ NACWA, 2008 Financial Survey, 2008.

¹¹ USEPA, CHP Manual, 2006.

¹² 26 USC §45 (excerpts)

The term “open-loop biomass” means-- (i) any agricultural livestock waste nutrients, or (ii) any solid, nonhazardous, cellulosic waste material ... (I) any ... forest-related resources..., (II) solid wood waste materials..., but not including [emphasis added] municipal solid waste, gas derived from the biodegradation of solid waste, or paper which is commonly recycled, or (III) agriculture sources, including orchard tree crops, vineyard, grain, legumes, sugar, and other crop by-products or residues.

Landfill gas facilities. ...a facility producing electricity from gas derived from the biodegradation of municipal solid waste.

Trash facilities. ... a facility...which uses municipal solid waste to produce electricity.

¹³ H.B. 2454 (excerpts)

Renewable Electricity – means electricity generated (including by means of a fuel cell) from a renewable energy resource or other qualifying energy resources.

Other Qualifying Energy Resource – means any of the following:

- (A) Landfill gas.
- (B) Wastewater treatment gas.
- (C) Coal mine methane used to generate electricity at or near the mine mouth.
- (D) Qualified waste-to-energy.

Qualified Waste-To-Energy – means energy from the combustion of municipal solid waste or construction, demolition, or disaster debris, or from the gasification or pyrolyzation of such waste or debris and the combustion of the resulting gas at the same facility, provided that—

- (A) such term shall include only the energy derived from the non-fossil biogenic portion of such waste or debris;
- (B) the Commission determines, with the concurrence of the Administrator of the Environmental Protection Agency, that the total lifecycle greenhouse gas emissions attributable to the generation of electricity from such waste or debris are lower than those attributable to the likely alternative method of disposing of such waste or debris; and

Renewable Biomass- means any of the following:

- (A) Materials, pre-commercial thinnings, or removed invasive species from National Forest System land and public lands ...
- (B) Any organic matter that is available on a renewable or recurring basis ..., including –
 - (i) renewable plant material, including--(I) feed grains; (II) other agricultural commodities; (III) other plants and trees; and (IV) algae; and
 - (ii) waste material, including--(I) crop residue;(II) other vegetative waste material (including wood waste and wood residues); (III) animal waste and byproducts (including fats, oils, greases, and manure); (IV) construction waste; and (V) food waste and yard waste.
- (C) Residues and byproducts from wood, pulp, or paper products facilities.

¹⁴ USEPA, Targeted National Sewage Sludge Survey (2009).

¹⁵ USEPA, Materials Characterization Paper In Support of the Advanced Notice of Proposed Rulemaking –Identification of Nonhazardous Materials That Are Solid Waste, Wastewater Treatment Sludge, Page 5, (2008).

¹⁶ Dominak, Robert; Foley, Frank; and Lavin, Lita. Improvements in Biosolids Quality Due to EPA's Pretreatment and Biosolids Programs. (2006).



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RESIDUALS MANAGEMENT VALIDATION PANEL

*Summary of Findings
and Recommendations*

August 29, 2008

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RESIDUALS MANAGEMENT VALIDATION PANEL

Summary of Findings and Recommendations

INTRODUCTION

The Northeast Ohio Regional Sewer District (District) convened a panel of nationally and internationally renowned biosolids management experts to assess the District's current biosolids handling and incineration project at the Southerly Wastewater Treatment Center (SWTC) in Cuyahoga Heights. The purpose of the panel was to objectively determine if the current plan adopts the most **energy efficient, environmentally friendly and cost-effective technology**. This panel, comprised of the following members, met together August 11-15, 2008, in Independence, Ohio:

- Cecil Lue-Hing, Ph.D. D.Sc., PE, BCEE, NAE
- Terry Logan, Ph.D.
- Scott Harder, PE
- Perry Schafer, PE, BCEE
- Tim Shea, Ph.D., PE, BCEE
- Lori Stone, PE
- Jim Welp, PE

The objectives of the panel included:

- Review the recommendations made in the District's *Long-Term Residuals Management Plan* (January 2005).
- Investigate newer biosolids management technologies.
- Determine the carbon footprint of various biosolids management options.
- Determine if the current incineration plan is still the most viable and cost-effective option for the District.

The District provided background materials, including the *Long-Term Residuals Management Plan*, detailed economic analyses updated to December 2007 costs, regulatory permits, and residuals quality and quantity data, for the panel members to review prior to the workshop. These materials set the foundation for further discussion and were used to validate the District's previous and current work.

In order to fulfill the panel's objectives, the panel members discussed whether there were other viable biosolids technologies for the District. After much dialogue, the panel independently decided upon the following criteria for identifying and evaluating such technologies / systems:

- Provide a proven and sustainable system.
- Produce Class A biosolids.
- Fit on a limited available site at the SWTC (small footprint required).
- Provide renewable energy and reduced greenhouse gas emissions.
- Minimize trucking, odor, and noise impacts.

The technologies/systems selected for further evaluation, and described in the attachments to this report, are:

1. Incineration with co-generation (Green Power).
2. Class A product via Cambi-digestion.

Economic and greenhouse gas emissions assessments of the aforementioned options were also conducted.

Each panel member participated in the workshop discussions and undertook various technology development, evaluation, and reporting assignments. In addition to the Findings and Recommendations contained herein, the following attachments A through G are provided.

Attachments

- A. Workshop Agenda
- B. Review and Validation of the District's *Long-Term Residuals Management Plan*
- C. Technology/System Option: Incineration with Green Power
- D. Technology/System Option: Cambi-digestion + Class A Product
- E. Carbon Footprint and Economic Comparison of Options
- F. Staffing Optimization Opportunities
- G. Panel Response to Schmack BioEnergy Presentation

BACKGROUND

In January 2005, the District's Board of Trustees and Senior Staff approved a *Long-Term Residuals Management Plan* that included the replacement of Southerly's four existing multiple hearth incinerators (MHIs) with three new state-of-the-art fluidized bed incinerators (FBIs). The aging MHIs, which are 23 feet in diameter and about four stories high, date back to 1964, with improvements made in the late 1970s. Operating at 1,500 degrees-F, 24 hours per day, seven days per week, the incinerators combust about 80,000 wet tons of biosolids per year. Even though the current equipment consistently meets federal and state regulations, the outdated incinerators are nearing the end of their useful life and must be replaced.

Moreover, the District's Zimpro system, which thermally conditions the biosolids before dewatering and incineration, has reached the end of its useful life. Improvements to extend the Zimpro equipment life for an additional 10 years were made in 1995.

The District is committed to providing efficient management and operation of its wastewater treatment plants. Faced with the challenges of aging equipment, rising operational costs, changing regulations, and increasing energy demands, the District wanted to determine if the current plan is the most viable, cost-effective way to manage biosolids for the future.

To this end, the District gathered a panel of experts to review and validate the District's plan to ensure that biosolids are managed in an environmentally friendly, responsible, reliable, flexible, and cost-effective manner.

FINDINGS AND RECOMMENDATIONS

The panel's findings and recommendations are presented accordingly.

Findings

Energy Efficient

- The planned FBI project will reduce natural gas consumption by 98 percent (about \$1 million savings per year) compared to the existing system.
- Opportunities exist to generate electric power from waste heat to offset purchased power (Green Power) resulting in approximate savings of \$0.4 to 1.6 million per year.

Environmentally Friendly

- Compared to the existing incineration technology (MHIs), the planned FBI project significantly reduces regulated air emissions.

- The proposed FBI project will reduce greenhouse gas emissions by about 14,000 tons (carbon dioxide equivalent metric tons, mtCO₂e) per year compared to the existing incineration technology/system.
- The proposed FBI project with Green Power can further reduce greenhouse gas emissions by about 16,000 mtCO₂e per year.
- The proposed FBI project, with or without Green Power, poses the least odor, noise, and traffic impacts to surrounding communities compared to all of the other options evaluated.

Cost-Effective

- The District's decision to phase out and decommission the Zimpro facilities is correct. The existing facilities are at the end of their useful life and there is increasing risk of serious operational failure.
- The cost and risk of increased operation and maintenance, coupled with the likelihood and magnitude of process equipment failure, are significant (approximately \$7,100 each day the proposed FBI construction is delayed).
- The proposed FBI project minimizes uncontrollable costs, including natural gas, purchased power, and diesel fuel.
- The proposed FBI project with Green Power is the most cost-effective solution expressed on a life cycle cost basis.

Recommendations

- Proceed with the proposed FBI design and construction.
- Reconsider the Green Power option.
- Accelerate FBI project implementation, and concurrently evaluate, design and construct the Green Power facilities.
- Develop a contingency plan for unplanned process shut-downs, including the ability to manage biosolids due to Zimpro and MHI failures.
- Review staffing plan for future FBI operating conditions, including construction phasing, start-up, and Green Power operations.
- Develop a comprehensive sampling plan for liquids and solids streams, not only to more accurately quantify percent volatile solids content, but also to aid in process control and operations decision-making.
- Update/develop stakeholder communication plan in light of capital commitments and increased stakeholder interest.

ATTACHMENT A

Workshop Agenda

Northeast Ohio Regional Sewer District Residuals Management Validation Workshop August 11-15, 2008 Independence, Ohio

Agenda – Monday, August 11th

Topic	Time
WELCOME AND INTRODUCTIONS/ OVERVIEW OF AGENDA (STONE AND NEORS D PERSONNEL)	9:30 – 9:40 am
SESSION 1 – NEORS D LONG-TERM RESIDUALS MANAGEMENT PLAN OVERVIEW AND DISCUSSION (DOMINAK AND JANOSKO) <ul style="list-style-type: none"> Review key aspects of the District’s Long-Term Residuals Management Plan, Southerly WWTC’s Biosolids Handling and Incineration Program and Current Program 	9:40 – 10:45 am
Break	10:45 – 11:00 am
SESSION 1 (CONTINUED) – ‘WHERE WE’VE BEEN AND WHERE WE ARE...’ <ul style="list-style-type: none"> Continue presentation Questions and Answers 	11:00 - 12:00 noon
Lunch	12:00 – 1:00 pm
SESSION 2 - TOUR OF SOUTHERLY WWTC <ul style="list-style-type: none"> Travel to Southerly to tour facilities 	1:15 – 3:15 pm
Break	3:15 – 3:30 pm
SESSION 3 – PANEL DISCUSSION <ul style="list-style-type: none"> Q&A with District personnel concerning the issues covered in the Morning Sessions and the tour of the Southerly WWTC. 	3:30 – 4:30 pm
SESSION 4 – WRAP-UP DAY 1 <ul style="list-style-type: none"> “Top 3 Issues” Survey from Validation Panel Members Develop Game Plan Identify Assignments 	4:30 – 5:00 pm
Adjourn Day 1	5:00 pm

Agenda – Tuesday, August 12th

Topic	Time
RECAP FROM PREVIOUS DAY AND REVIEW TODAY’S AGENDA (STONE)	9:00 – 9:30 am
SESSION 5 – SCHMACK BIOENERGY PRESENTATION (SCHMACK COMPANY) <ul style="list-style-type: none"> • Process development background • Experience with municipal solids, including primary-only, biological-only, and blended solids feed streams • Process diagram • Design and operations requirements (sizing, performance, mixing, energy, footprint, staffing) • Summary of installations • Warranties and service support • Questions and Answers 	9:30 – 10:30 am
Break	10:30 – 10:45 am
SESSION 6 – DISTRICT RESIDUALS MANAGEMENT COST ANALYSIS (HARDER) <ul style="list-style-type: none"> • Overview • Cost basis and analysis • Planning and implementation cost tracking • Panel discussion 	10:45 – 12:00 pm
Lunch	12:00 – 1:00 pm
SESSION 7 – CARBON FOOTPRINTING (HARDER)	1:00 – 2:15 pm
Break	2:15 – 2:30 pm
SESSION 8 – BRAINSTORMING CONCERNS/IDEAS FOR FURTHER CONSIDERATION <ul style="list-style-type: none"> • “Round Robin” • Identify key concerns or information gaps • Frame ideas for further consideration 	2:30 – 4:30 pm (periodic breaks to be included)
Wrap-Up and Adjourn Day 2	4:30 - 5:00 pm

Agenda – Wednesday and Thursday, August 13-14th

Topic	Time
RECAP FROM PREVIOUS DAY AND REVIEW TODAY’S AGENDA (STONE)¹	9:00 – 9:30 am
SESSION 9 – “A PROBLEM WELL-DEFINED IS HALF-SOLVED” <ul style="list-style-type: none"> Review concerns/opportunities Determine main themes/options Develop plan to “drill down” 	9:30 – 10:30 am
Break	10:30 – 10:45 am
SESSION 9 - CONTINUED	10:45 – 12:00 noon
Lunch	12:00 – 1:00 pm
SESSION 10 – TAG TEAM OR BREAK-OUT PANEL WORK <ul style="list-style-type: none"> Assign members/teams to implement “drill down” plan Work session 	1:00 – 3:00 pm
SESSION 11 – PULSE CHECKS UPDATE TO DOMINAK, JANOSKO, ET. AL. , WEDNESDAY <ul style="list-style-type: none"> Brief reporting to Dominak, Janosko, et. al. Update INFORMATION NEEDS/Q&A <ul style="list-style-type: none"> Recommendations and next-steps plan, Thursday Summarize main ideas and recommendations Develop briefing points Develop report outline Identify writing assignments and schedule 	3:00 – 4:30 pm (periodic breaks to be included)
Wrap-Up and Adjourn Days 3-4	4:30 - 5:00 pm

¹ The agenda for Wednesday and Thursday will depend on the issues identified and discussed in previous work sessions. This agenda is intended to be a guide for time management and is subject to change.

Agenda – Friday, August 15th

Topic	Time
RECAP FROM PREVIOUS DAY AND REVIEW TODAY’S AGENDA (STONE)	9:00 – 9:15 am
SESSION 12 – DEVELOP BRIEFING POINTS AND RECOMMENDATIONS <ul style="list-style-type: none"> • Develop briefing points • Confirm recommendations • Determine action plan for next steps, with responsibilities and schedule 	9:30 – 10:45 am
<i>Break (Travel to the District’s EMSC Complex near Southerly)</i>	10:45 – 11:00 am
SESSION 13 – REPORT-OUT PRESENTATION WITH DISTRICT PERSONNEL <ul style="list-style-type: none"> • Review Validation approach • Discuss findings • Confirm next steps 	11:00 – 12:00 pm
<i>Lunch with District²</i>	12:00 – 3:00 pm
<i>Additional discussions with District Personnel and Validation Panel Members</i>	
<i>Wrap-Up and Adjourn Day 5</i>	3:00 pm

² Departure to airport will be from the EMSC Complex near Southerly, and times may vary based on participants’ travel schedules.

ATTACHMENT B

Review and Validation of the District's Long-Term Residuals Management Plan

The District provided the validation panel with copies of the *Long-Term Residuals Management Plan* approved in January 2005, updated economic analyses of alternatives representing December 2007 costs, residuals quantities and quality data, regulatory permit information, and aerial photographs of the Southerly Wastewater Treatment Plant site. The validation panel members reviewed these resources prior to meeting at the Residence Inn in Independence, Ohio from August 11 – 15, 2008.

District staff gave presentations to the panel, and accompanied them on a tour of the Southerly solids handling facilities. Updates regarding the design status of the proposed FBI project were provided by District staff, and representative design documents were reviewed by panel members throughout the week.

The following comments and findings were discussed by team members:

- The *Long-Term Residuals Management Plan* was exceptionally thorough in its investigation of existing conditions, unit disposal costs, and screening and evaluation of alternatives. The screening and alternatives evaluation was based on site-specific constraints, and economic and non-economic criteria. The economic comparison included a net present value analysis, and the non-economic comparison was made with respect to permissibility, product marketability, site availability, odor potential, truck traffic and noise impacts.
- The *Long-Term Residuals Management Plan* and economic evaluation were found to be comprehensive. Further, the economic sensitivity analyses for both the 2005 and 2007 scenarios were robust.
- The relative ranking of alternatives did not change as a result of using updated life cycle costs.
- A comparison of alternatives based on non-economic factors also strongly favored the recommended incineration option.
- A clear separation in rankings between the recommended option (FBI with back-up landfilling) and the other options existed.

The panel held additional discussions regarding the residuals quantities and characteristics.

- **Due to the sensitivity of gas production projections to variations in total solids and volatile solids content, the panel recommends confirmation of the volatile solids content to refine FBI energy projections. It was also emphasized that the District should implement a comprehensive monitoring and measurement plan to verify process performance and to help make operations decisions.**

Panel members commended the District for the level of detail and organization of the plan, and confirmed that it was based on a sound evaluation process.

The FBI design basis was also reviewed and verified. Recognizing the potential risks associated with the aging Zimpro and MHI equipment, the validation panel reviewed the proposed incineration implementation schedule. Panelists explored the risk and cost impacts of not meeting the proposed schedule. Moreover, benefits of accelerating the schedule were also evaluated.

A snapshot of the proposed FBI implementation is provided below.

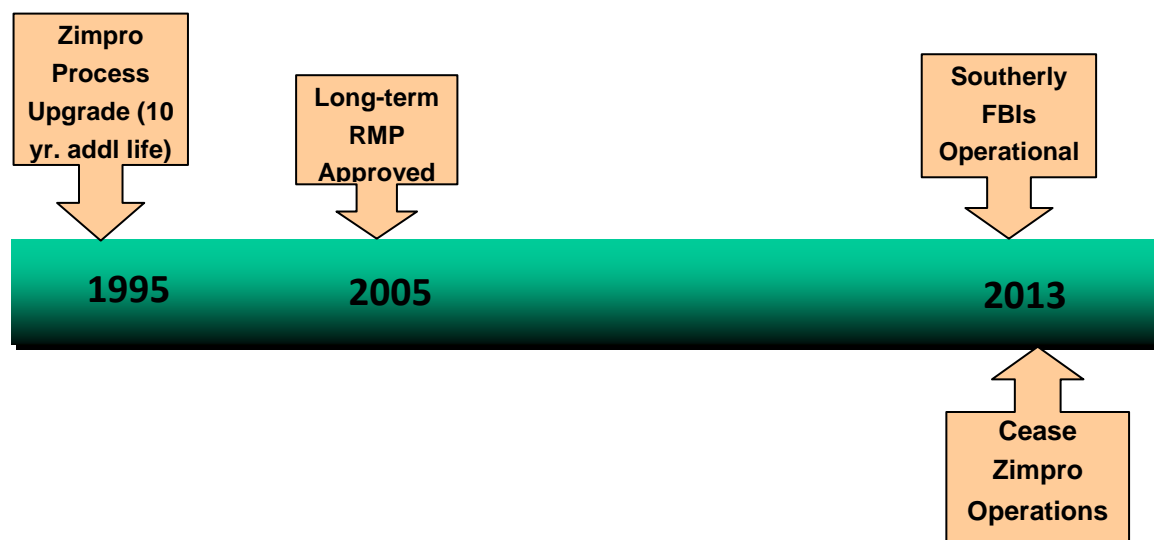


Figure B-1. Proposed FBI Implementation

The Zimpro process upgrade in 1995 extended the equipment life to 2005. Continued operations and maintenance costs are expected to increase until the FBIs are constructed and operational in 2013.

An analysis of the known financial impacts of delay is provided in Table B-1. Other risks associated with delay were discussed and include:

- Increasing costs to maintain Zimpro and MHI operations.
- Unexpected costs from Zimpro and MHI process interruptions.
- Increasing natural gas prices.
- Costs for backup landfilling due to unplanned Zimpro and MHI shutdowns.
- Increased truck traffic and noise due to backup landfilling operations necessitated by Zimpro and MHI process downtime.

Table B-1. Estimated Financial Impacts of FBI Project Delay

Item	Cost
Capital Expenditures	\$118,000,000
Less 15% Cash	17,700,000
Net Bond Financing	\$100,300,000
Annual Debt Service (4.5%/20 yr)	-\$7,700,000
Plus Construction Inflation	\$5,850,000
Change in O&M with Project	\$4,400,000
Net Annual Cost of Delay	\$2,600,000
<i>Cost per Day</i>	<i>\$7,100</i>
Incremental Rate Increase per MCF per year	\$0.55

A snapshot of the potential cost savings – approximately \$2.6 million if the schedule is accelerated by one year – is presented below in Figure B-2.

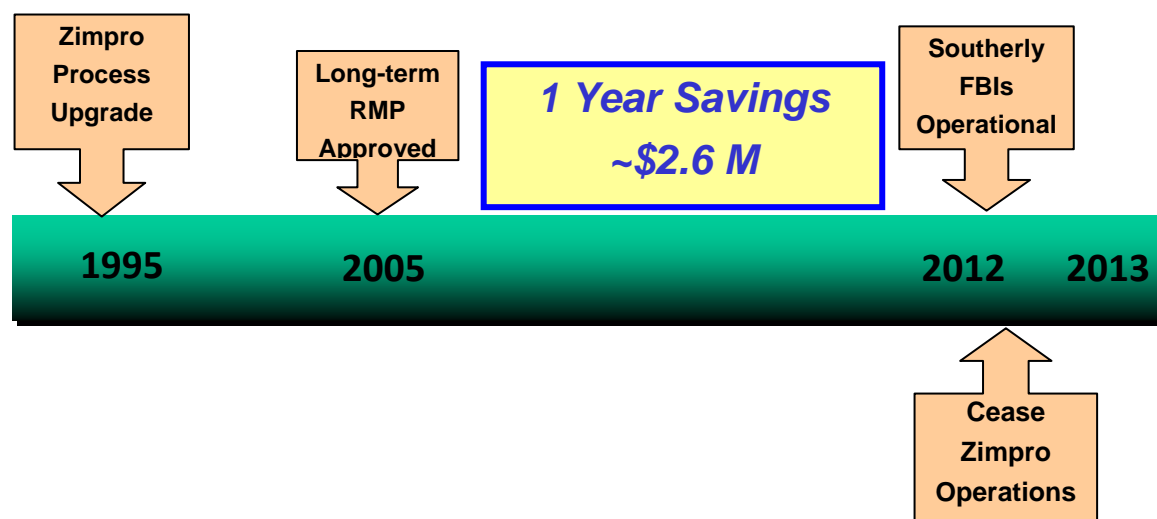


Figure B-2. Accelerated FBI Implementation

Opportunities to accelerate the implementation schedule include, but are not limited to, the following:

- Develop and agree on a procurement strategy.
- Investigate a "site preparation" contract involving demolition of old digesters and construction of new foundation up to grade.
- Coordinate contracts with equipment delivery.
- Accelerate the commissioning of the new dewatering centrifuges to reduce risk.

With the cost of delay over \$7,000 per day, the validation team recommends that the District pursue an accelerated FBI implementation schedule.

ATTACHMENT C

Technology/System Option: Incineration with Green Power

INTRODUCTION

The District prepared an evaluation of waste heat boiler and power generation for the planned FBI project. The results were presented in TM 410 dated October 8, 2007. A schematic of the planned incineration project is shown in Figure C-1.

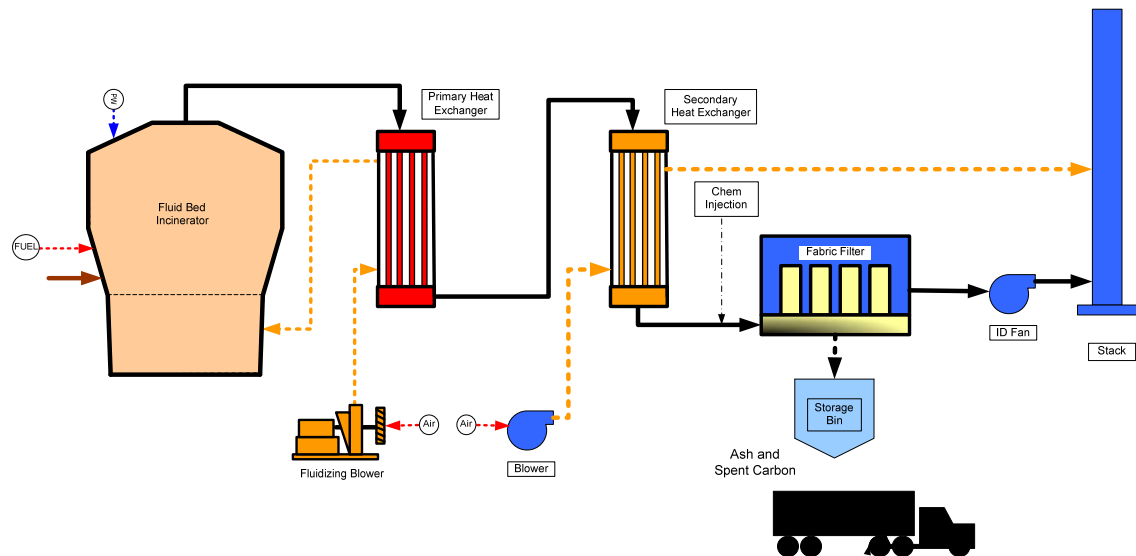


Figure C-1. Heat Recovery Schematic Proposed (similar)

Incineration with Green Power Option

The validation team determined that Incineration with Green Power should be evaluated and considered for the District. A schematic of this option is presented in Figure C-2.

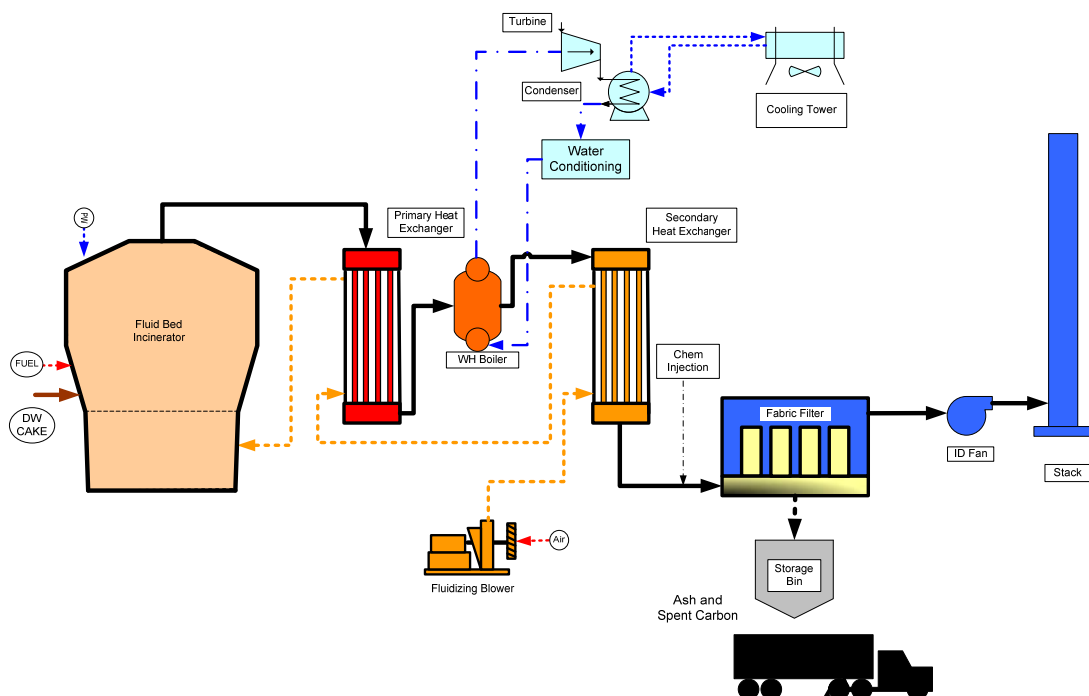


Figure C-2. Incinerator Schematic with Green Power Generation

Energy production was developed for both non-condensing and condensing turbines. Condensing turbines are more efficient but require a better treatment of water quality to avoid maintenance issues in the last stages of the turbine. All the alternatives are on the smaller side of condensing turbines. It is recommended that the District familiarize its staff with issues and opportunities for both types of turbines.

In TM 410, the steam system was complicated with heating loads and interconnection with the building heating system and other process loads. For the comparison, all the steam was used for power generation.

Higher installation costs for the condensing turbines were assumed for this analysis. The electrical system is assumed to be completely used within this building so the power production could be set up to reduce the quantity of purchased power. Since a new substation is part of the project, this can be incorporated into the design. The plant uses approximately 13 MW (average) and this new power supply is 10 to 20 percent of average plant power usage. Jim Welp recommends using the cost of power as the benefit.

The current plan has plume suppression with a secondary heat exchanger. A reheat coil may be needed for plume suppression.

Biosolids Characterization

The analysis in TM 410 was based on incineration of dewatered biosolids at 30 percent total solids (% TS) and 62 percent volatile solids (% VS). This volatile solids content seems fairly low for a typical plant that treats 90 percent residential sewage. The validation team recommends that the District reviews the volatile solids content and confirm that internal recycle streams are not impacting the current sampling locations. For the evaluation of a proposed green power option, Jim Welp conducted a sensitivity analysis using both the reported 62% and a more typical value of 70% VS.

It was noted that the analysis in TM 410 was based on a dewatered cake of 30% TS. We understand that the District has piloted raw sludge dewatering and that this testing indicated that they were able to achieve 30% TS. However, as with the VS discussion, once the Zimpro sludge is removed from the recycle streams, a more conservative value of 28% should be considered. Many utilities are able to reliably dewater to 28% TS with raw wastewater solids. To be conservative, the comparison of options was based on 28% TS and for sizing/costing the equipment. It should be noted that NO_x emissions increase with higher solids content.

Green Power Comparison with TM 410

The costs and sensitivity of power production for various biosolids characteristics are shown below.

Table C-1. Green Power Comparison

Item	TM 410	Green Power Alternative 1	Green Power Alternative 2
Feed Rate, dtpd	162.7	162.7	162.7
Total Solids, %	30	28	30
Volatile Solids, %	62	70	70
Steam Temp, F	700	750	750
Steam Pressure, psig	450	600	600
Steam Capacity, lb/h	19,940	26,000	36,000
Electricity, MW (Non-Condensing Turbine)	0.65	1.4	1.8
Electricity, MW (Condensing Turbine)	1.14	2.6	3.6
Cost	\$16,500,000	\$22,000,000	\$22,000,000

Schedule

The construction schedule of the planned FBI project should be reviewed with respect to cost savings opportunities by accelerating project implementation. The District should consider:

- Timing of equipment delivery with construction contract.
- Potential for a “foundation” contract to install pilings, foundation, base slab, and possibly operation floor at grade if this is on the critical path.
- Provide separate commissioning schedule for dewatering and incineration and determine if there is an advantage to having dewatering and truck loading as a risk contingency to thermal conditioning.

The proposed schedule could be accelerated by one year or more by considering the above factors, as well as other strategic procurement alternatives.

Procurement Alternatives

Based on experience with other projects, it is possible to successfully procure equipment through an equipment procurement process. Issues for consideration include:

- Use of an evaluated bid process with price being approximately a third to half of the evaluation criteria to make sure the proposed equipment met the objectives.
- Require the incinerator supplier to sign a novation agreement with the General Contractor to work under them for the installation of the reactor which the supplier was required to construct.
- Alignment between Supplier and General Contractors goals by giving them a meaningful payment (up to 30%) on substantial completion.
- Allowance of a six month window for equipment delivery to the General Contractor; partial payment was provided for equipment ready to ship and required verifications of storage.
- Change order definition to account for small changes that will occur for the General Contractor (i.e., define basis of bid and how it will be reviewed).
- Define SCADA requirements and coordination points expected from the equipment supplier. Identify and standards they are to follow and require a pre-programming coordination meeting with District, General Contractor, Consultant, and SCADA programmer.

ATTACHMENT D

Technology/System Option: Cambi-Digestion + Class A Product

INTRODUCTION

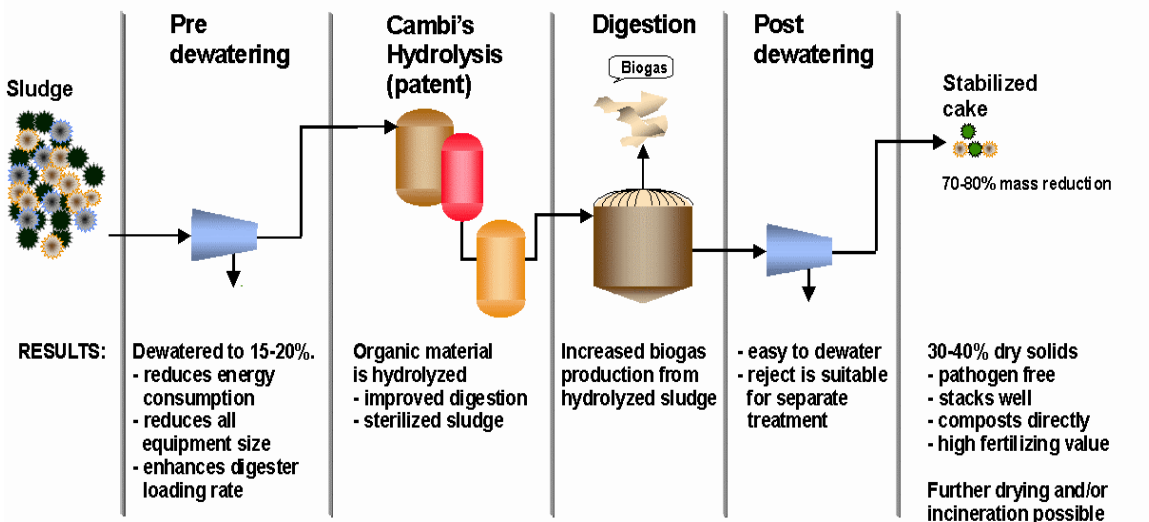
The panel evaluated potential alternative technologies and approaches that could process the Southerly plant solids into a usable beneficial product, to be used in some form of land application program or in fertilizer or soil conditioner production and marketing in Northeast Ohio. The panel felt that the biosolids product needed to be a Class A material and needed to have the capability for utilization during all seasons of the year - i.e., be a sustainable product and program. With very limited usable area available at the Southerly plant site, and the large solids production quantities, the panel felt the approaches and options were highly constrained. By reviewing proven technologies and approaches along with the other constraints and criteria, the team selected the Cambi-Digestion approach as a logical one to evaluate in more detail. Biosolids thermal-drying options were considered, but the panel knew from previous experience these would be high-cost options, requiring more site-area, and have less desirable carbon footprint.

Perry Schafer, Terry Logan, and Tim Shea developed a concept for a solids processing facility that would include Cambi thermal hydrolysis, mesophilic anaerobic digestion facility and a CHP (combined heat and power) system. The effort included the preparation of a cost estimate and a biosolids product analysis as the biological alternative to FBI incineration.

Terry Logan's biosolids product analysis is presented at the end of this attachment. The facility would produce Class A biosolids for multiple possible outlets to agricultural land application and to topsoil manufacture.

Scott Harder developed a life cycle cost analysis based on the following conceptual design and operations requirements.

Cambi Process Description



Concept for Cambi-Digestion Alternative

- The facilities needed for this alternative will require in the order of 5 acres and therefore the 'A' location at Southerly contains about 2.3 acres and was therefore inadequate in area for the new complex.
- The 'B' and 'C' areas that were available for new facilities contain in excess of five acres and therefore were selected as the site for a Cambi-digestion facility as described below.
- These areas are located about 600 feet easterly of the 'A' area, at the edge of the property, and would allow the development of a solids processing facility that would leave open the central area of the plant for future expansion of the liquid treatment train.
- It was assumed that the new facility would include the following processes and operations:
 - Provide a terminus for a utility corridor from the existing treatment plant for transfer of sludge and reject water streams to and from the new facility.
 - Provide a StrainPress facility for treatment of the Easterly sludge flow, the Southerly primary sludge, and the blended skimmings from Easterly before a blending and dewatering operation. The Southerly biological sludges would not require StrainPress treatment. The StrainPress operation would enhance the quality of the Class A products for unlimited distribution and marketing.
 - A bay would be required for a dumpster to collect the material removed in the StrainPress facility.

- The streams would be blended and dewatered to 15 to 18% TS as a feed stock to the Cambi process.
- Three Cambi thermal hydrolysis trains would be provided, each interconnected.
- The thermally-hydrolyzed flow would be transferred to three mesophilic anaerobic digesters, followed by a single secondary digester that could also serve as a primary digester. All four digesters would be of the same dimensions and design.
- The digested biosolids would be dewatered and transferred to the truck outloading facility or onsite storage. The onsite storage capacity to be provided was three (3) days of dewatered cake production.
- The outloading facility would have two separate bays, the first for transfer of Class A biosolids cake to beneficial use locations, and the second for transfer of raw cake to tractor trailers for haul to landfill as a back-up system.
- The biogas generated in the process would be used to fuel a combined heat and power system and to satisfy the parasitic heat needs of the Cambi process.

Basis of Concept Design and Cost Estimate

The following basis was used for the concept design:

- Design for peak monthly capacity with 13-day HRT at peak monthly loading rate of 225 DPTD at 11% TS feed to digesters (490,000 gpd), yielding a 18.2-day HRT at average annual loading rate.
- Requires:
 - Strain Press system – sludge flow is 1 mgd or five units; skimming flow to take two units in addition; one spare = 8 eight Parkson strain presses; building to contain skimmings receiving, sludge receiving, truck load-out bay for screenings, odor control, etc. Allow \$20 million.
 - Dewatering station #1 for Cambi feed – feed at 4% TS; peak weekly at 260 DTPD or 1,555,000 gpd; feed at 18% DS to thermal hydrolysis. Use two Westphalia or Alfa Laval large machines at 600 gpm. Three machines enclosed all in at \$15 million.
 - Thermal hydrolysis - each train has 125 DTPD of capacity so will need a total of 58,765/125 or 1.28 trains for annual average loading rate, and 2.02 trains per peak week. Use two trains each with six reactors (five duty) at \$15 million each or \$30 million in total.
 - Provide three digesters at 2.15 million gallons each plus one for storage at same size = 8.6 million gallons total. Cost at \$7 per gallon = \$60.2 million.

- Solids from digester at 62% volatile solids and 50% VSR and 7% TS; this stream will load a belt filter press capable of 630 lbs TS per hour per meter and 155 DTPD of sludge. Operate 24 hours per day, seven days per week. Need seven 3-meter machines plus spares to get to 10 total. Use \$ 1.5 million per machine all in or \$15 million.
- Post digestion dewatering @ \$10 million. Total dewatering both pre and post digestion - use \$35 million including building.
- Truck outloading facility for say 500 CY/day average, two separate dedicated bays (one for digested and one for raw), three (3) days of finished cake storage and odor control - \$20 million.
- CHP system – 1,600,000 SCFD of biogas at 60% methane and 600 BTU/SCF = 960 MM Btu/day. Assume 3 MW for a Cambi system, net of the parasitic heat use.
- CHP system cost is \$15 million all in.
- Utilities and pipeline in a corridor - \$10 million.
- Total capital cost before mark-ups: \$190 million.

O&M Costs

- 111 DTPD of dry solids or 40,500 DTPY; 317 WTPD or approximately 350 CY as Cambi cake; \$5/WT FOB plant to topsoil; \$40/WT to agricultural land application.
- 25% to land application; 75% to topsoil.
- Pump-over, strain-pressing, odor control and outloading - \$400,000/year.
- All in \$1.8 million/year for operation of beneficial use outlets, and includes a biosolids coordinator (topsoil \$650,840 @ \$7.50/ton for 75%; land application @ \$1,157,000 for 25% or total @ \$40/WT).
- \$2.0 million/year for thermal hydrolysis by Cambi and mesophilic anaerobic digestion except second stage dewatering.
- \$2.0 million/year for second stage dewatering (\$50/DT x 111 x 365).
- Total \$6.2 million/year.

Revenue

- 3,000 kilowatts x \$0.069 x 8,640 = \$1.8 million/year.
- Assume 95% availability.
- Net revenue = <\$1.7 million/year > (first year).
- Net cost is \$4.5 million/year (first year).

Beneficial Use of Cambi/Anaerobic Digestion Cake Product

The filter cake product generated by the Cambi/anaerobic digestion (AD) process would be Class A. The Cambi thermal step provides high enough temperatures for disinfection. The temperature in the reactors is 170 °C for 45 minutes. VAR would be achieved by volatile solids reduction in the AD step (the AD step is estimated to provide about 50% volatile solids reduction).

The Cambi/AD biosolids can be dewatered to 30-35% solids. This material has been shown to be friable, with low odor characteristics, and readily stacked. Work at DCWASA (District of Columbia Water and Sewer Authority) showed that the material could be blended with mineral soil to produce marketable topsoil. The material can also be land applied to agricultural crops or for land reclamation.

The proposed system at Southerly would produce approximately 116,000 wet tons annually at 35% solids. It is proposed that 75% of the annual production will go to topsoil blenders in the area, and 25% to seasonal land application.

Topsoil Blending

Work at DCWASA showed that the Cambi/AD cake could be blended at a ratio of 3:1 mineral soil to Cambi/AD cake. This will require 261,000 tons of mineral soil and will generate 319,000 tons of blended topsoil. There are a number of topsoil blenders in the greater Cleveland area, the biggest of which and the operation closest to Southerly is Kurtz Brothers. The total annual sales of topsoil in the area are not known, but the projected production of Cambi/AD blended topsoil will represent a significant increase in total area topsoil production. This will require firm long-term contracts with area topsoil blenders and market development on their part. There is significant uncertainty as to whether long-term contracts can be developed in advance of plant startup.

Land Application

Approximately 29,000 tons of Cambi/AD cake will be land applied for agriculture, with minor amounts for occasional land reclamation projects. The Long-Term Residuals Management Plan estimated that there are about 446,000 acres of cropland in seven counties in NE Ohio. A more conservative estimate of land within 30-40 miles of Southerly is 374,000 acres. At a nitrogen loading rate, the Cambi/AD cake would be applied at approximately 5 tons/acre. This would require 5,800 acres per year. Although other area municipalities land apply their biosolids, there will be adequate acreage in the area for sustained land application to agriculture. Contracts will have to be negotiated with area land application companies.

The major uncertainty with respect to land application is seasonable weather. Windows for land application are usually August to November for wheat, August to November and April for corn and soybeans, April to November for hay. Early fall rains and late spring rains are common and can prevent land application. More importantly, OEPA has proposed revisions to its land application rules that will prohibit land application of biosolids on snow-covered or frozen land, or on land with a forecast for rainfall. This will greatly lower the opportunity for land application in the period November to May.

Cambi/AD Storage

The proposed design allows three days of storage at Southerly. The assumption is that most of the material will be trucked daily to the soil blending sites, with the remainder trucked to land application sites during seasonable windows. NEORSD will have to apply to Ohio Environmental Protection Agency (OEPA) for a variance on the 120-180 days storage requirement by arguing that blended topsoil is exempt from the storage requirements. A significant increase in storage time at Southerly would require a large increase in capital costs.

ATTACHMENT E

Carbon Footprint and Economic Comparison of Options

INTRODUCTION

A primary objective of the validation workshop was to assess the carbon footprints of the proposed fluid bed incineration alternative as it compares with that of existing multiple hearth incineration operations and other potential solids management options.

Carbon Footprinting

The carbon footprinting analysis sought to compare and contrast the annual emissions generated through normal operations of: 1) fluid bed incineration, 2) fluid bed incineration with co-generation ("Green Power"), 3) multiple hearth incineration, and 4) commercial landfilling. This reconnaissance level analysis will be followed by a more in-depth GHG inventory analysis currently underway.

For purposes of this analysis, carbon footprinting is defined as the annual greenhouse gas ("GHG") emissions due to normal solids processing operations. Emissions related to construction or other "life cycle" emissions are not included in the analysis with the exception of polymer supply chain emissions. Carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) are the three greenhouse gases of primary interest in wastewater treatment operations. Total emissions are expressed in metric tons of CO₂ equivalents. CH₄ emissions are adjusted to equivalent CO₂ emissions by multiplying by a defined Global Warming Potential value of 21. (That is, 1 ton of CH₄ emissions is equivalent to 21 tons of CO₂.) N₂O emissions are similarly adjusted to equivalent CO₂ emissions by multiplying by a defined Global Warming Potential value of 310. One ton of N₂O emissions is equivalent to 310 tons of CO₂.

Emissions estimates rely upon emissions factors established for fossil fuel combustion, generation of electric power in Ohio, and fugitive emissions established for various solids management processes. With the exception of supply chain emissions related to the manufacture and transport of polymer to the Southerly Wastewater Treatment Center, supply chain emissions have been assumed to be negligible.

Climate change mitigation programs in the United States rely on several protocols that have been developed for the accounting of GHG emissions. These include the World Resources Institute and World Business Council for Sustainable Development protocols; ISO 14064; the California Climate Action Registry General Reporting Protocol; the U.S. EPA Climate Leaders Greenhouse Gas Inventory Guidance; and the recently published Climate Registry General Reporting Protocol. The recently published Climate Registry

General Reporting Protocol draws on the other guidance documents, and is the protocol for the largest North American voluntary carbon markets. It is also the registry used by the Regional Greenhouse Gas Initiative (RGGI) and the Western Climate Initiative. It is the primary basis for this analysis.

Most GHG accounting protocols require that boundaries for the analysis be established at the facility or organizational level. These boundaries may be either financial or operational. For purposes of this analysis, the GHG emissions estimates are limited to the solid management processes at SWTC and do not include emissions from the liquids processes.

Based on the Climate Registry General Reporting Protocol, GHG emissions fall into four categories: Scopes 1, 2, and 3, and Biomass CO₂ emissions.

Scope 1. Direct Emissions include all GHG emissions that result from burning of fossil fuels on-site or in company owned vehicles.

Scope 2. Indirect Emissions include those associated with any purchased electricity, steam, heating or cooling.

Scope 3. Indirect Emissions include those emissions not included in Scope 2, and are optional in all reporting schemes. These emissions typically include supply chain operations or other sources outside of the direct control of the District or the SWTC.

Biomass CO₂ Emissions are those generated by the onsite combustion of biomass and are reported separately from the other scopes. For purposes of this analysis, a small amount of fossil carbon is assumed to be present in the biosolids, generating a small amount of reportable Biomass CO₂.

For this analysis, emissions from purchased power would be considered Scope 2; emissions from natural gas combusted in existing incinerators would be considered Scope 1; and emissions from proposed biomass combustion would be both Scope 1 (CH₄ and N₂O) and accounted for outside of the other scopes (CO₂).

Under most voluntary market requirements, the quality of emissions calculations is divided into three tiers based on the method of calculation. Tier A, which is considered the highest quality, is either a direct measurement of waste stream emissions or the measured carbon content (per unit mass or volume) of the fuel. Tier B calculations use measurements of fuel heat content per unit energy, either default or measured carbon content factors, and a default heat value factor. Tier C calculations use default fuel emissions factors. Organizations are encouraged, but not required, to use the highest quality tier that is practical.

Table E-1 below presents the sources of emissions that were examined for this planning level analysis. Table E-2 presents the annual emissions estimates in equivalent metric tons of CO₂. Both the FBI with Green Power and the Cambi-digestion + Class A Product options offer a net reduction in Scope 1 and 2 emissions due to reduced purchased electric power.

Table E-1. Emissions Sources

	SCOPE 1 Direct	SCOPE 2 Indirect	SCOPE 3 Other Indirect	BIOMASS COMBUSTION
Alternative	CO₂, CH₄, N₂O	CO₂, CH₄, N₂O	Metric tons CO₂ equivalents	CO₂
Baseline MHIs	Natural gas Biosolids transport fuel Ash transport fuel Fugitive emission	Electric power	Polymer supply chain	Biosolids incineration
FBI	Natural gas use Ash transport fuel	Electric power	Polymer supply chain	Biosolids incineration
FBI with Green Power	Natural gas use Ash Transport fuel	Electric power	Polymer supply chain	Biosolids incineration
Cambi-digestion + Class A Product	Topsoil transport Land app. transport Disposal transport	Electric power	Polymer supply chain	
Landfill Disposal	Biosolids transport fuel Decay emissions	Electric power	Polymer supply chain	

Table E-2. Emissions Estimates

	SCOPE 1 Direct	SCOPE 2 Indirect	TOTAL SCOPES 1+2	SCOPE 3 Other Indirect	BIOMASS COMBUSTION
Alternative	CO₂, CH₄, N₂O	CO₂, CH₄, N₂O	Metric tons CO₂ Equivalents	CO₂, CH₄, N₂O	CO₂
Baseline MHIs	13,780	5,500	19,280	6,000	1,570
FBI	500	5,200	5,700	6,000	1,570
FBI with Green Power ²	500	-11,000	-10,500	6,000	1,570
Cambi-digestion + Class A Product	570	-8,800	-8,230	8,000	n/a
Landfill Disposal	24,525	750	25,275	6,000	n/a

Economic Comparison of Options

Another primary objective of the validation workshop was to re-assess the relative cost-effectiveness of fluid bed incineration and other potential solids management options.

The workshop participants used life cycle cost analysis methods similar to those used by the District for its Southerly and Easterly Facility Plan projects. Life cycle costs were developed for a forty year analysis period and included upfront capital, annual operating and maintenance, periodic renewals and replacements, and a terminal value at the end of the analysis period. All options were assumed to start operation in 2013. Construction and operating costs were escalated in accordance with inflation factors adopted by the District.

Life cycle cost analysis is standard practice in judging the relative economic benefits of projects that may differ in upfront capital and ongoing operating costs. By employing a “time value of money” approach, the projects are evaluated on an apples-to-apples basis.

Table E-3 presents both life cycle and greenhouse gas emissions for the proposed FBI project, FBI with Green Power, and the Cambi-digestion + Class A Product options.

Table E-3. GHG and Life Cycle Cost Comparison

Option	GHG (mtCO ₂ e)	Life Cycle Cost, \$M
FBI	5,700	250
FBI with Green Power	-10,500	230
Cambi-digestion + Class A Product	-8,230	370

ATTACHMENT F

Staffing Optimization Opportunities

The major unit processes in the existing residuals treatment train are dewatering, Zimpro, and four multiple hearth incinerators. According to District staff, this complex is currently staffed by 154 full-time employees. The proposed new complex will consist of dewatering and three fluidized bed incinerators (FBIs).

Until the new FBIs are online, construction phasing and the decommissioning of the Zimpro process will require a clear transition and start-up operations plan. Since the Zimpro system will not be needed to provide feedstock to the FBIs, it will be decommissioned as soon as the FBIs are installed and operational. When this occurs, the complex will have one less major system (Zimpro) to operate and maintain.

When this operational status is reached, it is likely that some staff optimization would be feasible via cross-training, transfers, and/or attrition.

The operation and maintenance of additional green power facilities presents opportunities to cross-train, utilize existing staff, and/or contract out operations.

In view of the foregoing, it is recommended that the feasibility of staff optimization be explored for the new incineration operations.

ATTACHMENT G

Panel Response to Schmack BioEnergy Presentation

Representatives from the Schmack BioEnergy Company gave a brief presentation to the panel on August 12, 2008. The representatives in attendance were Annette Burger (from the City of Akron composting facility), Clemens Halene (Vice-President of Engineering), and Mel Kurtz. The presenters gave a professional presentation about the technical aspects of the process. The Schmack BioEnergy process has been developed in response to energy challenges in Germany primarily processing agricultural materials; it was adapted for use in the industrial sector (i.e., food processing). It is currently in the process of being adapted for application in the municipal biosolids processing arena.

Panelists posed a diversity of questions to the representatives, which were responded to in a straight-forward manner. Based on the presentation, the responses to the questions posed during the presentation, and the discussions that followed, panel members arrived at the following conclusions:

- The adaptation of the process from the processing of agricultural materials to municipal biosolids is a work-in-progress.
- The process has very limited operational experience in the United States and worldwide handling biosolids materials. To date, the total extent of their operational experience in the U.S. and worldwide is six months – all of which has been gained at the Akron composting facility. The company is currently in the process of negotiating potential contracts with Columbus and Canton, Ohio.
- With respect to size of operations, their experience with municipal biosolids is attributed to the Akron operation, which handles approximately 15 dry tons per day (about 10 percent of the District's total production).
- The Schmack process requires an input feed concentration of five percent total solids, while the District is able to provide only a feed of 0.5 percent solids. An additional cost would be required to meet the increased total solids feed concentration.
- Due to site limitations at the Southerly plant, a separate site would need to be provided by Schmack. The siting and purchase of a separate site would warrant considerable time in project implementation.
- Impacts of sidestreams (i.e., nitrogen concentrations) that would return to the Southerly wastewater treatment plant are unknown; this is a critical consideration as nutrient discharge limits become more stringent.

- During the presentation, it was noted that the Schmack system was presented as proprietary, yet none of the unit processes are patented.
- Technology issues:
 - Technology appears to have merit once biosolids processing adaptations are overcome and more relevant large-scale operational experience is gained.
 - The primary unit processes of the system are well-known and proven for biosolids application in the U.S. (dewatering, equalization, digestion).
 - It is unclear why solids are dewatered to 25 percent, and then diluted again prior to equalization and digestion. This process step is implemented at the Akron facility and is proposed for the District.
 - The “PFRP” unit process shown in the process train to produce a Class A product is not defined.
 - The overall system does not present any new innovative technology but rather the planned adaptation of existing technologies to wastewater biosolids.
 - The system proposed to the District does not provide for odor control, which represents an unaccounted for cost item.

Based on the information reviewed, it appears that the system proposed by Schmack BioEnergy is simply a privatization project. Alternative project delivery and financing methods proposed by Schmack may not be consistent with District procurement policies and statutory requirements.

In summary, the panel’s comments with respect to the Schmack BioEnergy presentation are:

- The process experience demonstrated in Germany is with animal manures, food and agricultural wastes.
- There is very limited biosolids processing experience in the U.S. or elsewhere.
- This process is not ready for District-scale implementation.

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Ken Kirk

August 23, 2010

Attention Docket ID No. EPA-HQ-OAR-2003-119

EPA Docket Center (EPA/DC)

Environmental Protection Agency, Mailcode 6102T

1200 Pennsylvania Ave., NW

Washington, DC 20460

Via Electronic Mail: a-and-r-Docket@epa.gov

Re: NACWA Comments on Proposed CISWI MACT Standards (75 Fed. Reg. 31938; June 4, 2010)

Dear Sir or Madam,

The National Association of Clean Water Agencies (NACWA) appreciates the opportunity to comment on the proposed standards of performance for new stationary sources and emission guidelines for existing sources: commercial and industrial solid waste incineration (CISWI) units (75 Fed. Reg. 31938; June 4, 2010). Over the past year EPA has proposed several rule changes that will have major impacts on sewage sludge incinerators (SSIs). NACWA remains concerned that EPA's actions via these rulemakings will create unnecessarily duplicative and burdensome regulation of SSIs. EPA's proposed rule for CISWI units includes provisions to avoid duplicative Clean Air Act (CAA) requirements for SSIs presuming the Agency finalizes its planned Section 129 maximum achievable control technology (MACT) rulemaking for SSIs. However, as proposed the CISWI exclusions for SSIs contain errors that must be revised before finalizing the rule.

NACWA offer the following comments and suggested revisions:

- (1) NACWA supports excluding all SSIs from applicability under the CISWI rule.

NACWA strongly supports EPA's exclusion of SSIs under the plain meaning of the CAA, which will help avoid the potential for duplicative and conflicting requirements. While we agree that SSIs should be addressed under a single set of standards, we disagree with EPA's current approach of setting those standards under CAA section 129 instead of section 112.



NACWA and its members have been submitting information to EPA regarding the separate SSI rulemaking, and NACWA intends to submit comments on the proposed SSI rule when it is published. In addition, NACWA recently commented on EPA's proposed definition of non-hazardous solid waste (75 Fed. Reg. 31844; June 4, 2010), which EPA is using to determine which secondary materials are a solid waste when combusted. NACWA believes that sewage sludge should be excluded from the definition of solid waste and, thus, SSIs from the definition of solid waste incineration units. NACWA incorporates those comments by reference (see Attachment A hereto).

In particular, we emphasize the importance of harmonizing any future standards for SSIs so as to preserve the existing framework for regulating sewage sludge incineration under 40 C.F.R. Part 503. The risk of disrupting the unique regulatory scheme for sewage sludge incineration with incompatible or redundant requirements is apparent. For example, in the preamble discussion regarding the rationale for the SSI exemption (75 Fed. Reg. 31960/1), the Agency lists sewage treatment plants and SSIs together with other categories of exempt units that are subject to, or will be subject to, new source performance standards and emission guidelines, and concluding that there are "no standards" in effect for SSIs. If this reference to "standards" means NSPS or EG (see 75 Fed. Reg. 31939/3), then EPA is mistaken. The NSPS for sewage treatment plants (40 C.F.R. Part 60 Subpart O) contains particulate matter and opacity standards applicable to sewage sludge incinerators that combust more than 10 percent sewage sludge or that charge more than 1000 kg per day sewage sludge produced by municipal sewage treatment plants. In addition, 40 C.F.R. Part 503 Subpart E imposes risk-based limitations for arsenic, cadmium, chromium, lead, and nickel; compliance with the National Standards for Hazardous Air Pollutants (NESHAPs) for mercury and beryllium; operational emission limits for total hydrocarbon (the surrogate for all potentially toxic organic compounds) or an alternative emission limit for carbon monoxide; and numerous other general management, monitoring, recordkeeping and reporting requirements. The importance of harmonizing EPA's incineration rulemakings with the Part 503 program is discussed in detail in NACWA's comments on the proposed non-hazardous solid waste definition rule.

Finally, we emphasize that EPA cannot regulate SSIs under the CISWI category because EPA has not developed the legal or factual basis to do so. The rulemaking record is devoid of any substantive evaluation of SSIs and does not evaluate the merits of regulating SSIs under the CISWI category. Through a separate rulemaking process EPA has collected some (albeit limited) emission data from SSI stack tests; however, these data are apparently not contained in the CISWI rulemaking docket and are not considered in the MACT floor analysis.

- (2) The SSI exclusions need to be revised to correct an important typographical error and to clarify the description of SSIs.

The SSI exclusions are contained in paragraph 60.2020(n) (NSPS program) and paragraph 60.2555(n) (EG program). However, due to an apparent oversight, the proposed applicability sections read: "This subpart exempts the types of units described in paragraphs (a), (c) through (i) and (*m*) of this section ..." (italics added). To correct this error, sections 60.2020 and 60.2555 should read:

"This subpart exempts the types of units described in paragraphs (a), (c) through (i), and (m) through (n) of this section ..."

We also request that the description of SSIs under paragraph (n) be modified to account for those SSIs that also combust scum (e.g., skimmings, the floatable materials removed during wastewater treatment) and to recognize

that SSIs may also combust these materials for waste heat recovery and/or energy recovery. We propose the following description:

“Incineration units combusting sewage sludge or scum (the floatable materials removed during wastewater treatment) for the purpose of reducing the volume of the sewage sludge by removing combustible matter or for heat or energy recovery. Sewage sludge incineration unit designs may include fluidized bed and multiple hearth.”

* * *

Again, NACWA appreciates the opportunity to comment on the proposed rule. Please contact me at chornback@nacwa.org should you have any questions or concerns.

Sincerely,



Chris Hornback

Senior Director, Regulatory Affairs

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EXECUTIVE DIRECTOR

Ken Kirk

August 3, 2010

Proposed Rulemaking–Identification of Non-Hazardous
Secondary Materials That Are Solid Waste
U.S. Environmental Protection Agency
Mailcode: 28221T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Attention: Docket ID No. EPA-HQ-RCRA-2008-0329

Dear Sir or Madam:

The National Association of Clean Water Agencies (NACWA) appreciates this opportunity to provide comments on the United States Environmental Protection Agency's ("EPA" or "the Agency") proposed rule titled "Identification of Non-Hazardous Secondary Materials That Are Solid Waste" (Proposed Rule). 75 Fed. Reg. 31844 (Jun. 4, 2010). NACWA represents the interests of nearly three hundred of the nation's publicly owned wastewater treatment utilities (POTWs), which collectively serve the majority of the sewered population in the United States. For forty years, NACWA has maintained a leadership role in legal and policy issues affecting clean water agencies, and has been at the forefront of the development and implementation of scientifically-based, technically-sound, and cost-effective environmental programs for protecting public and ecosystem health.

EPA's Proposed Rule, if finalized, will have an immediate and significant impact on the ability of many of NACWA's members to manage the thousands of tons of sewage sludge they generate on a daily basis. NACWA's members rely on having multiple options for the management of this sludge, but the list of available options has slowly shrunk over the years for many municipalities. EPA's proposed action will have a devastating impact on sewage sludge incineration – which is used to manage approximately a fifth of the sludge generated annually in the U.S. – and eviscerate progress toward a new, viable source of renewable energy for the country.

Accordingly, NACWA requests that EPA:

1. Exercise its discretion and exclude or exempt sewage sludge that is combusted from the final rule's definition of non-hazardous solid waste and preserve the current successful regulatory framework for sewage sludge and sewage sludge incinerators (SSIs) pursuant to the regulations contained within 40 C.F.R. Part 503 (Part 503).



2. Recognize that sewage sludge and scum (a.k.a. skimmings, the floatable materials removed during wastewater treatment) are legitimate fuels.
3. Classify the energy recovery and energy production devices employed by POTWs, both as elements of the incineration process and as stand-alone processes, as legitimate energy recovery systems.
4. Strengthen the language in the Proposed Rule to clearly indicate that its determination that sewage sludge is a non-hazardous solid waste does not apply to, and will not impact, other sewage sludge management options regulated under Part 503.

With these comments, NACWA urges EPA to adhere to Congress' clear intent to provide for the safe use and disposal of sewage sludge, to preserve local control over these management choices, to promote the beneficial use of sewage sludge, and to preserve incineration as a safe, viable, and cost-effective management practice for sewage sludge.

NACWA also requests that EPA decouple finalization of the Proposed Rule from the finalization of the proposed Commercial/Industrial Solid Waste Incinerators (CISWI) Definitions Rule, 75 Fed. Reg. 31938, and the proposed Boiler Maximum Achievable Control Technology (MACT) Rule, 75 Fed. Reg. 32005, both issued in the *Federal Register* on June 4, 2010. Finalization of the proposed rules in tandem is inappropriate as stakeholders must know what solid wastes are covered under the new rule before they can meaningfully comment on the solid waste incineration and boiler rules.

I. EPA Should Preserve the Current Successful Regulatory Framework for Burning Sewage Sludge Pursuant To Part 503

A. EPA Can Exclude or Exempt Sewage Sludge from the Proposed Rule

The Agency should provide a regulatory exclusion for sewage sludge burned in incinerators, which it sought comment on in the Proposed Rule. This will preserve the current framework for regulating sewage sludge under Part 503, which was developed under the authority of Clean Water Act (CWA) § 405 and the Resource Conservation and Recovery Act (RCRA).¹ EPA clearly has discretion to take such action, and has exercised it to create several other RCRA definitional exclusions. 40 C.F.R. § 261.4 (excluding materials from regulation as hazardous wastes).

EPA also has the discretion to exempt sewage sludge burned in incinerators. RCRA § 1006(b) requires EPA to integrate RCRA requirements with the requirements of the CWA and the Clean Air Act (CAA), as well as other laws. To prevent regulatory duplication, EPA has a non-discretionary duty to consider all environmental laws when promulgating regulations under RCRA. EPA has repeatedly exercised this discretion to ensure that waste management regimes created under other laws are not disrupted. For example, EPA exempted certain PBA-contaminated wastes from RCRA regulation because they are already managed under the Toxic Substances Control Act (TSCA). 40 C.F.R. § 261.8; 55 Fed. Reg. 11798, 11841 (Identification and Listing of Hazardous Waste) (March 29, 1990) (finding that “new regulation of these wastes under RCRA may be disruptive” and “does not appear to be necessary,” as “the regulation of these wastes under TSCA is adequate to protect human

¹ 75 Fed. Reg. 31866 (inviting comments on whether “it is within [EPA’s] discretion . . . to provide a regulatory solid waste exclusion for sewage sludge burned in incinerators that would preserve the current framework for regulating sewage sludge managed under section 405 of the CWA to avoid redundancy”).

health and the environment”). Similarly, EPA has exempted industrial ethyl alcohol from RCRA regulation because such regulation “was considered redundant” in light of comprehensive regulations already implemented by the Bureau of Alcohol, Tobacco and Firearms. 40 C.F.R. § 261.6(a)(3)(i); *see* 51 Fed. Reg. 28664, 28671 (Exports of Hazardous Waste) (August 8, 1986).

Both Congress and EPA gave comprehensive and careful thought to the proper regulation of the use and disposal of sewage sludge under the CWA, the CAA and RCRA. Deeming sewage sludge a solid waste when incinerated for promulgation of a rule under CAA § 129 violates EPA’s non-discretionary duty to harmonize environmental laws under RCRA because emissions from SSIs are already comprehensively regulated under other statutes. EPA has both the authority and the duty to maintain the comprehensive sewage sludge management programs already in place under these laws and, accordingly, must exclude or exempt sewage sludge that is combusted from the Proposed Rule.

B. EPA Should Exclude or Exempt Sewage Sludge from the Proposed Rule and Preserve the Current Successful Regulatory Structure for SSIs

Since the 1960s, federal regulation of publicly owned treatment works (POTWs) and sewage sludge has evolved under the CWA, the CAA, and RCRA, culminating in recent decades in a complete and comprehensive program that proactively regulates all facets of the use of sewage sludge. In particular, the Part 503 regulations and CAA § 112 form a cohesive, time-tested regulatory framework that provides for the safe use and disposal of sewage sludge, including incineration and other beneficial uses. America’s clean water agencies have invested heavily in and depend on this clear regulatory system.

1. Sewage Sludge Quality and Incineration Is Strictly Regulated under the CWA

Since 1993, POTWs that practice incineration have been subject to a comprehensive, risk-based program for reducing the potential environmental risks of sewage sludge pursuant to CWA § 405 and the implementing regulations set forth in Part 503. Section 405(d) of the CWA requires EPA to establish numeric limits and management practices that protect public health and the environment from the adverse effects of pollutants in sewage sludge. Section 405(e) of the CWA prohibits any person from disposing of sewage sludge from a POTW through any use or disposal practice for which regulations have been established pursuant to Section 405, except in compliance with the Part 503 regulations.

In the Part 503 regulations, EPA has specified the management practices for the utilization and disposal of sewage sludge that are protective of public health and the environment. As established by the risk assessment for Part 503, emissions from the incineration of sewage sludge are low and do not pose a risk to public health or the environment. 58 Fed. Reg. 9248, 9249 (Feb. 19, 1993) (Standards for the Use or Disposal of Sewage Sludge) (“even when sludge is incinerated and the population potentially exposed to the incinerator emissions is greater, the effects are small”). To ensure the safety of sewage sludge incineration, Part 503 requires risk-based limitations for arsenic, cadmium, chromium, lead, and nickel; compliance with the National Standards for Hazardous Air Pollutants (NESHAPs) for mercury and beryllium; operational emission limits for total hydrocarbon (the surrogate for all potentially toxic organic compounds) or an alternative emission limit for carbon monoxide; and numerous other general management, monitoring, recordkeeping and reporting requirements. 40 C.F.R. Part 503, Subpart E.

The numeric emission limits and management practice requirements established under the Part 503 regulations are based on one of the Agency’s largest risk assessments that was conducted in the late 1980s and

early 1990s to protect human health and the environment from any reasonably anticipated adverse effects from pollutants that may be present in sewage sludge.² As a result, SSIs demonstrate that the emissions from their units are not adversely impacting human health and the environment by demonstrating compliance with the Part 503 requirements. Moreover, the Part 503 regulations are continually reviewed as EPA regularly identifies and performs risk assessments on newly identified pollutants. *See, e.g.*, 66 Fed. Reg. 66228 (Dec. 21, 2001) (evaluating dioxin levels in sewage sludge and determining that “no further regulation of sewage sludge that is placed in a surface disposal unit or incinerated in a SSI is needed to protect public health and the environment from any reasonably anticipated adverse effects of dioxins”); 68 Fed. Reg. 75531 (responding to the National Research Council’s recommendations based on its review under Section 405(d)(2)(C)).

Pursuant to 40 C.F.R. Part 403 (Part 403), POTWs additionally implement, through local regulatory authority, pretreatment standards to prevent discharge of pollutants to the POTW that may pass through or interfere with treatment processes. Pretreatment reduces harmful constituents in the sewage sludge combusted by incinerators. Pretreatment has dramatically reduced the contaminants in sewage sludge and accordingly emissions from SSIs have become cleaner. Comparison of the sewage sludge quality measured in the 1980s³ with the measurements in 2006-2007 Targeted National Sewage Sludge Survey shows a clear improvement in sewage sludge quality since Part 403 and 503 were implemented.⁴ Specifically, the Northeast Ohio Regional Sewer District (NEORS), which serves the City of Cleveland and 61 suburban communities, has seen significant decreases in the concentrations of heavy metals in both its influent, attributable to the Part 403 regulations, and its effluent, attributable to both Part 403 and 503.⁵ Between 1980 and 2004, NEORS has seen the concentration of lead in the influent reduced by 95% while the concentration of lead in the effluent was reduced by 100%.⁶

Given the reduction in metals entering wastewater treatment plants due to effective pre-treatment programs and the implementation of Part 503, there has been a significant reduction in air emissions from SSIs since the early 1970s. Many POTWs are able to lower emissions far below the site-specific metal concentration limits for burned sewage sludge calculated using the Part 503 risk-based formula because of improvements in scrubber devices and in operational techniques developed by POTWs to comply with the Part 503 limits including higher exhaust gas temperatures, lower burning zone temperatures, and higher pressure drops.

For example, at NEORS’s Southerly and Westerly wastewater treatment plants (Plants), emissions are only a fraction the of the Plants’ Part 503 regulatory limits for actual maximum metal and total hydrocarbon:⁷

² EPA, *A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule* (1995), at 107 (“[T]he risk assessments quantitatively identified allowable concentrations or application rates of pollutants in biosolids that are used or disposed that protect human health and the environment from reasonably anticipated adverse effects.”).

³ *See* EPA, *40 City Study* (1982); EPA, *National Sewage Sludge Survey* (1988).

⁴ *See infra* at Section II(c)(2)(b).

⁵ *See* Lita Laven, Frank Foley and Robert Dominak, *Improvements in Biosolids Quality Due to EPA’s Pretreatment and Biosolids Programs*, Residuals and Biosolids Management Conference 2006, at 142-147 [Attachment 1].

⁶ *Id.* at 147, Table 1.

⁷ Southerly and Westerly Plants’ Part 503 Reports for 2009 provide additional details.

	Highest Actual Emissions as a Percentage of Regulatory Limit	
	Southerly 2009	Westerly 2009
Arsenic	1%	3%
Cadmium	4%	3%
Chromium	1%	1%
Lead	1%	7%
Nickel	0.02%	0.03%
Total Hydrocarbon	27%	6%

The Plants' beryllium and mercury emissions, as tested in 1993 and 1995 are also a fraction of the NESHAPS limits:

	Highest Actual Emissions as a Percentage of Regulatory Limit	
	Southerly	Westerly
Beryllium	1%	0.4%
Mercury	4%	2%

The NEORSD Plants are not unique in their performance and use widely adopted technologies and operational standards. The dramatic decrease in metal concentrations in sewage sludge and the low metal and total hydrocarbon emission levels demonstrate that the CWA's regulation of sewage sludge from pretreatment to incineration is both exhaustive and protective of human health and the environment.

2. Current Clean Air Act Regulation of Incineration of Sewage Sludge Is Effective and Should Not Be Abrogated

Further reason for EPA to promulgate an exclusion or an exemption to the new solid waste definition that preserves the current regulatory regime for sewage sludge is that Congress wrote CAA § 112 to directly regulate sewage sludge emissions. Section 112(e)(5), promulgated in the 1990 CAA amendments, requires EPA to establish emission standards for hazardous air pollutants (HAPs) for POTWs. In particular, CAA § 112(e)(5) states:

The Administrator shall promulgate standards pursuant to subsection (d) of this section applicable to publicly owned treatments works (as defined in Title II of the Federal Water Pollution Control Act [33 U.S.C.A. § 1281 et seq.]) not later than 5 years after November 15, 1990.

42 U.S.C. § 7412(e)(5). Congress' express inclusion of POTWs, including SSIs, under CAA § 112 demonstrates express intent to regulate air emissions from SSIs under the CAA's § 112 framework. EPA should implement this Congressional intent through an exclusion or exemption or under the rule.

EPA has already regulated the incineration of sewage sludge as intended under CAA § 112, by identifying SSIs as an area source category under CAA § 112. In 2002, EPA determined that the SSI category does not have any sources with the potential to emit HAPs at a level approaching major source levels,⁸ and included SSIs as an

⁸ See *National Emission Standards for Hazardous Air Pollutants: Revisions of Source Category List under Section 112 of the Clean Air Act*, 67 Fed. Reg. 6521 (Feb. 12, 2002).

additional area source category under CAA §§ 112(c)(3) and 112(k)(3)(B)(ii).⁹ EPA implemented these CAA § 112 requirements as Congress intended. The fact that EPA determined there was no basis under CAA § 112 to issue substantive air emission requirements for SSIs, because they all were area sources, is simply a recognition that the burning of sewage sludge did not trigger such regulation under the requirements established by Congress.

Moreover, since 1974, EPA has also imposed New Source Performance Standards (NSPS) for SSIs under CAA § 111. *See* 40 C.F.R. Part 60, Subpart O. Under the existing NSPS for SSIs, regulated incinerators must comply with emission limits for particulate matter and opacity, as well as operational, monitoring, testing and reporting requirements. In addition to the federal requirements applicable to SSIs outlined above, public agencies operating SSIs are also required to obtain a Title V operating permit if they are “major sources” as defined by the CAA. States also have authority to regulate and, in fact, do regulate air emissions from SSIs under their respective CAA State Implementation Plans.

Together, the CWA, CAA § 111 and CAA § 112 SSI emission regulations have protected human health and the environment for over twenty years. Defining sewage sludge that is combusted as a solid waste will result in the regulation of many SSIs under CAA § 129, which is contrary to Congressional mandate, is not appropriate or necessary for the protection of human health and the environment, and will impose huge costs on municipal agencies that are struggling to meet other environmental mandates.

C. Supplanting Part 503 with a New Regulatory Regime Will Disrupt America’s Sewage Sludge Infrastructure with No Significant Improvements to Public Health

EPA correctly recognized that the Proposed Rule will impose indirect costs through the Boiler MACT and CISWI proposed rules, which will, as currently proposed, compel regulation of SSIs under CAA § 129.¹⁰ The costs imposed will be huge and are not tied to clear environmental benefits or public health benefits for residents near SSIs. NACWA estimates total capital costs associated with SSI MACT standards imposed as a direct result of the Proposed Rule would be in excess of \$3 billion, along with a substantial increase in operating expenses. There is no pressing public health rationale for saddling public agencies that incinerate with enormous new costs for upgrades and/or alternative management of sewage sludge. Moreover, while EPA assumes a certain public health benefit from a move away from incineration, the reality is that some of the other management options required if incineration is no longer a viable option may actually result in substantially higher emissions than incineration.

NACWA estimates that 17%-22% of all sewage sludge generated in the U.S. is incinerated, which could be in the range of 4 to 6 million wet tons per year. Incineration results in complete destruction of all pathogens, emerging contaminants, pharmaceuticals and many other undesirable trace constituents of sewage sludge. Upgrades for compliance with CAA § 129 to incinerators that already safely and efficiently process nearly a quarter of the nation’s sewage sludge will be cost-prohibitive for many POTWs. Each incinerator would need to be outfitted with numerous different technologies to comply with the MACT standards.¹¹ Roughly dividing the

⁹ *See National Emission Standards for Hazardous Air Pollutants: Revisions of Area Source Category List under Sections 112(c)(3) and 112(k)(3)(B)(ii) of the Clean Air Act*, 67 Fed. Reg. 43,112 (June 26, 2002).

¹⁰ 75 Fed. Reg. 31889 (analyzing the costs under the Boiler MACT and CISWI proposed rules).

¹¹ The necessary systems may include advanced scrubbing systems and/or wet electrostatic precipitators for reducing particulate matter and particulate-based metal emissions, the addition of sodium hydroxide and/or ammonia for reducing emissions of sulfur dioxide and
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estimated costs among the 230 operative POTW incinerators, upgrades to each incinerator unit could cost over \$13 million. POTWs operate on budgets that cannot accommodate tens of millions of dollars in additional capital costs and sizable increase in operating costs – with no appreciable environmental gain – particularly at a time of great economic distress coupled with the struggle of meeting other major regulatory obligations, including sewer overflow controls and nutrient reductions.

For POTWs that cannot upgrade because of a lack of space or an inability to fund upgrades, the alternative management options are problematic. Land applying or landfilling sewage sludge are more expensive than incineration in the long term and provide no benefits such as energy recovery, decreased transportation costs, and decreased transportation emissions. For POTWs that currently incinerate all of their sewage sludge, significant resources would be necessary just to develop the loading, storage, and stabilization infrastructure required for land applying or landfilling. One wastewater treatment agency estimates that it will cost \$9 million just to develop such infrastructure. Even where the infrastructure is already in place, the cost necessary to land apply or landfill more or all of a facility's sewage sludge is prohibitive.

The following are a few telling examples of the costs of incineration versus landfilling sewage sludge:

- An agency in Minnesota estimates that the operations and maintenance (O&M) costs associated with incineration of sewage sludge are \$200.00 per dry ton, including thickening. Because landfilled sewage sludge in Minnesota, like certain other states, must meet the Part 503 Class B pathogen reduction standards, the cost of landfilling is much higher. Minn. R. 7035.2535, Subp. 1, Item B. The estimated O&M costs necessary to prepare sewage sludge for landfill (i.e. alkaline stabilization) are \$300.00 per dry ton, including thickening and landfill disposal fees (\$100.00 per dry ton more expensive than incineration).
- In North Carolina, one agency estimates that incineration costs \$22 per wet ton, while landfilling costs \$95 per wet ton (\$73.00 per dry ton more expensive than incineration).
- In Ohio, it was reported that the current cost for incineration is \$157 per dry ton, while landfilling costs \$312 per dry ton (\$155.00 per dry ton more expensive than incineration).
- At the NEORSD's Southerly Plant, it costs over twice as much to landfill or land apply sewage sludge than to incinerate it. Moreover, land filling unit cost will substantially increase if incineration is no longer a viable option, and there are concerns about the remaining service life of the landfills in the area.
- According to an EPA report, one California POTW "indicated that the cost of incinerating its waste treatment sludge is, on an annual basis, \$4.3 million less than the cost of landfilling this material."¹²

In addition, some states have limits on how much sewage sludge can be landfilled or eliminate in-state landfilling as a management option.¹³ Increased reliance on landfills and limits to landfill use will force

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oxides of nitrogen, activated carbon absorbing systems and/or activated carbon injection system for reducing mercury emissions, and internal or external afterburners for reducing carbon monoxide emissions.

¹² EPA, *Materials Characterization Paper on Wastewater Treatment Plants*, March 18, 2010, p. 7.

facilities to truck sewage sludge to increasingly distant landfills resulting in higher transportation costs, including fuel costs.

Further increasing the burden on POTWs is the expectation that the cost differential between incineration and other management options will increase significantly in the coming years. NEORSR estimates that in 2013, the cost of incineration will be \$4 less than it is today while the cost of landfilling will increase by \$21 (per wet ton). Speaking in broad terms, in 2013 it will cost the facility \$9 million per year more to landfill its sewage sludge than to incinerate it. Moreover, it will cost \$10 to \$11 million per year more for land application than incineration. This would substantially impact the NEORSR's current O&M budget of \$40 to \$45 million per year.

Particularly for the numerous large cities that rely on incineration, landfilling and land application will always be more expensive alternatives. The significant costs to POTWs will be passed on to the rate payers. In the immediate future, rates are expected to increase dramatically even without the implementation of the Proposed Rule because of the well-documented funding challenges facing POTWs as they expand infrastructure and meet EPA mandates for prevention of overflows and nutrient loading. NEORSR estimates that its rates will double within six years due to the implementation of a \$3 billion combined sewer overflow control program and currently required improvements at its three treatment plants.

In addition to increased costs, land application and landfilling may actually result in higher emissions than those produced during incineration because of the distances sewage sludge must be transported. Through a detailed analysis of priority pollutant emissions associated with incineration, landfilling and land application, NEORSR and its consultants found that emissions of carbon monoxide, nitrogen oxide, and organics from three new fluidized bed incinerators being constructed at the Southerly Plant will be lower or equal to the emission levels from land application and landfilling, as follows:

Pollutant	Three Fluidized Bed Incinerators Total Emissions	Trucks Emissions Landfills (round-trip)	Trucks Emissions Land Application Sites (round-trip)*
Carbon Monoxide	3	4	7
Oxides of Nitrogen	44	46	71
Sulfur Dioxide	6	4	6
Organic Compounds	1	3	4

The calculated emissions above include only the projected air emissions from the three new fluidized bed incinerators and the trucks that would be used to transport the sewage sludge from the Southerly Plant to landfills or land application sites. It does not include any additional emissions once the sewage sludge reaches the landfill or land application site. In addition, since the Southerly Plant does not have digesters, nor the room to construct them, the only way to produce a land applicable product is through alkaline stabilization, which will increase emissions even further due to the emissions associated with the trucking of the lime from the quarry to the plant.

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¹³ See State of Connecticut Solid Waste Management Plan at 4-64 ("Sewage sludge, which is generated by the 111 wastewater treatment plants located in Connecticut, is managed in three ways: shipped out-of-state for management, composted at one of two composting sites in-state, or sent to one of the six sewage sludge incinerators located within Connecticut.").

By forcing a switch to landfilling, the Proposed Rule also negatively affects the environment by placing recyclables in landfills, which will significantly impact landfill capacity/life. Organizations including the National League of Cities, U.S. Conference of Mayors, and the Association of State and Territorial Solid Waste Management Officials have already expressed concerns to EPA regarding the Agency's presumption that many SSIs will be abandoned in favor of landfilling and the associated cost assumptions in the context of the proposed SSI MACT standards. In preliminary discussions over the proposed standards, EPA confirmed that it has not factored dwindling landfill capacity and the significant cost to construct new landfills into its economic analysis on the MACT standard proposal.

Incineration may also be the best management option for minimizing greenhouse gas emissions. Faced with potential regulatory changes and potential increases in all of its wastewater residuals management costs, in 2008 the NEORSO asked a Blue-Ribbon Panel (Panel) of seven internationally renowned sewage sludge management professionals to evaluate sewage sludge management alternatives.¹⁴ The Panel determined that the installation of new fluidized bed incinerators at the Southerly Plant was the most viable, cost-effective and environmentally friendly option for sewage sludge management.

The following is a summary of the Panel's greenhouse gas emissions analyses:

Sewage Sludge Processing	Greenhouse Gas Emissions (Metric Tons CO₂-equivalent/year)
Fluidized Bed Incineration with Energy Recovery and Electricity Production	-10,500*
Fluidized Bed Incineration without Energy Recovery	5,700
Landfilling (transport fuel + decay)	25,000

* Includes reduced emissions from purchased power (i.e., reduced power plant emissions).

The Panel also noted that greenhouse gas emissions associated with land application would likely be higher than incineration for NEORSO, but did not have time to conduct the analysis. While the emissions reported above are specifically for the Southerly Plant, conversion from incineration to landfilling or land application will also result in an increase in greenhouse gas emissions for numerous other POTWs.

Ultimately, the elimination of incineration as a viable, cost-effective and environmentally friendly sewage sludge management option will result in substantial increases in capital expenditures, operating and maintenance costs, emissions of priority pollutants and/or emissions of greenhouse gases for many POTWs.

II. Sewage Sludge Is a Legitimate Fuel and Not a Solid Waste

Pursuant to RCRA, and the preamble to the Proposed Rule, legitimate use and recycling are critical factors in determining whether a material is not "discarded" and therefore is not a solid waste. 75 Fed. Reg. 31844, 31851. If EPA does not grant an exclusion or exemption for sewage sludge, it should determine based on the data provided in these comments that sewage sludge is a legitimate fuel and that it is being recycled for beneficial uses.

¹⁴ Residuals Management Validation Panel, *Summary of Findings and Recommendations* (Aug. 29, 2008) [Attachment 3].

A. Sewage Sludge Incineration Is a Valuable Energy Recovery Source

Sewage sludge and scum incineration for energy recovery embodies the concept of legitimate use and recycling and the proposed Rule did not address these important RCRA concepts. Sewage sludge is an organic, renewable resource with the potential to become an important component of the country's renewable energy portfolio. Sewage sludge contains approximately 8,000 Btu/lb on a dry basis (2,000 Btu/lb on an as received basis assuming 25% solids) and can generate 2.3 kWh/lb.¹⁵ In reliance on the current Part 503 regulatory structure, significant technological innovation is underway involving energy production from the combustion of sewage sludge, both as a component of the incineration process and through stand-alone combustion processes. The Proposed Rule would halt the advancement of these technologies as they come under the onerous requirements of CAA § 129 and undermine Congressional directives to limit greenhouse gas emissions.¹⁶ In addition, implementation of the Proposed Rule could disrupt carefully crafted state regulatory schemes that encourage beneficial use.¹⁷

Sewage sludge can provide significant amounts of power for facility operations and for the nation's energy grid. At one facility, for example, heat from the incineration of sewage sludge is converted into high pressure steam, in boilers, that powers a steam turbine generator producing over 5 megawatts of electricity. While the potential for energy production is high, POTWs need support from EPA to promote the use of this sustainable and renewable energy resource.¹⁸ Not only does the Proposed Rule fail to promote the use of alternative fuels, but the Proposed Rule serves as a major disincentive for many current and developing energy recovery projects. In addition to the loss of the beneficial use from these projects, there will also be an addition of fuel use and costs to replace recovered energy.

Many facilities are currently maximizing sewage sludge utilization while minimizing fossil fuel use:

- A sanitary district in California reports that incineration of wastewater treatment sludge saves the district \$320,000 per year in energy costs by avoiding natural gas costs.¹⁹
- The NEORSD's Southerly Plant reports that it saves \$600,000 to \$700,000 per year in natural gas costs by operating waste heat boilers. In October 2000, U.S. EPA presented the NEORSD with a special beneficial use of sewage sludge award for energy conservation due to the use of a waste heat recovery system during incineration of sewage sludge at the Southerly Plant.

The efforts of these agencies to beneficially use sewage sludge may no longer be viable if the Proposed Rule is implemented. Furthermore, agencies in the process of constructing infrastructure to maximize sewage sludge energy recover may find their investments negated by the Proposed Rule:

¹⁵ See NACWA, *Renewable Energy Resources: Banking on Biosolids* (2010) at p. 3 [Attachment 2].

¹⁶ See, e.g., Energy Independence and Security Act (EISA), 42 U.S.C § 17001 et seq. (2007).

¹⁷ Some states currently exempt from solid waste regulations incinerators or energy recovery facilities that incinerate wastes generated by the facility that owns the incinerator or energy recovery facility. See, e.g., Ohio Administrative Code 3745-27-03(A)(5). The Proposed Rule opens the door for revocation of these exemptions and the potential for states to impose additional solid waste regulations on SSIs.

¹⁸ See NACWA, *Renewable Energy Resources* (detailing sewage sludge energy products, technologies, and barriers to widespread adoption of these technologies).

¹⁹ EPA, *Materials Characterization Paper on Wastewater Treatment Plants*, March 18, 2010, p. 7.

- NEORSD is in the process of constructing a new Renewable Energy Facility at its Southerly Plant that will include three new waste heat boilers and a steam turbine generator in conjunction with three new fluidized bed incinerators. The cost to purchase and install this equipment and to construct the steam turbine generator building was \$22 million with payback expected in 11 years. High pressure steam produced by new waste heat boilers will power a steam turbine generator that produces electricity, which will be used to run the incinerators and ancillary equipment. The steam turbine generator will produce 2.6 megawatts, while the plant's electrical demand is 13 megawatts. During the first year of operations, the cost savings associated with the steam turbine generator will be \$1.5 million, while greenhouse gas emissions associated with the reduced electrical power demands will be 16,000 metric tons CO₂e.

The Proposed Rule could dramatically impact the Southerly Plant's \$149 million Renewable Energy Facility. First, because there is only a limited amount of space around the new building, there may not be enough room to install all of the additional equipment that may be necessary to meet the final MACT Standards. Second, depending on the final MACT Standards, the layout of the equipment in the new building may need to be altered to facilitate compliance. Third, if for some reason the new MACT Standards are unachievable, the NEORSD's only viable management option would be landfilling. The cost to construct new sludge storage and truck loading facilities to fill 10,500 trucks per year could be in excess of \$50 million. In addition, hauling costs and tipping fees would be approximately \$18 million per year, far more than it costs to use the sewage sludge for energy recovery.

In sum, implementation of the Proposed Rule could eliminate energy recovery options for POTWs, create disincentives for POTWs to use energy recovery in the future, increase POTW dependence on fossil fuels, and increase reliance on less beneficial uses for sewage sludge management.

B. Sewage Sludge Incinerated for Energy Recovery Is Not Discarded

As described in detail above, incineration of sewage sludge is an important source of energy and plainly meets the flexible criteria courts have established for when a waste is not "discarded" and, therefore, not a solid waste. When this process is compared to the dictionary definition of "discard," it is clear that sewage sludge incinerated for energy recovery is not discarded because it is not cast aside, rejected, abandoned or given up.²⁰ In addition, this sewage sludge is beneficially reused in a continuous process of water treatment by the water treatment industry, *American Mining Congress v. EPA*, 824 F.2d 1177, 1186 (D.C. Cir. 1987); the sewage sludge is beneficially used shortly after its production and it is not stored for potential reuse, *American Mining Congress v. EPA*, 907 F.2d 1179, 1186 (D.C. Cir. 1990); and, the sewage sludge is being used by its producers, and not by a reclaimer, *United States v. ILCO*, 996 F.2d 1126, 1131 (11th Cir. 1993).²¹ Sewage sludge, a largely organic fuel that satisfies EPA's standards for a valuable product, is a legitimate fuel rather than a discarded waste.

²⁰ *Safe Air For Everyone v. Waynemeyer (Safe Air)*, 373 F.3d 1035, 1041 (9th Cir. 2004) citing *The New Shorter Oxford English Dictionary* 684 (4th ed. 1993).

²¹ Through assessment of the definition of "discard" and the above test derived from relevant rulings of the circuit courts, the Ninth Circuit recently held that Kentucky bluegrass residuals are not solid wastes when they are burned in the fields as part of the continuing growing process. *Safe Air*, 373 F.3d 1035. Sewage sludge incineration for energy recovery is analogous to the burning of Kentucky bluegrass because the heat created is used to power onsite sewage management operations.

C. Sewage Sludge Is a Legitimate Fuel

EPA has long-recognized that under RCRA a fuel is not discarded and is not a solid waste. EPA's legitimacy criteria for qualification of a waste as a fuel are easily satisfied by sewage sludge and scum. NACWA in these comments is providing data and context to demonstrate that sewage sludge indeed meets the legitimacy criteria and its combustion, via incineration or some other process, for energy recovery is legitimate reuse and recycling.

1. Sewage Sludge Has a Meaningful Heating Value and Is Managed as a Valuable Commodity

EPA is proposing that non-hazardous secondary materials must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy to be considered legitimate fuels. Proposed Rule § 241.3(d)(1)(i). First as previously discussed, sewage sludge has a heating value of approximately 2,000 Btu/lb as received. EPA's proposed minimum of 5,000 Btu/lb as received²² overlooks the significant energy recovery potential at lower levels of Btu/lb. Combustion of dewatered sewage sludge in an incinerator provides net energy that can reduce or eliminate fossil fuel usage within the incinerator unit and provide heat for energy recovery and/or energy production purposes. NACWA requests that EPA eliminate the arbitrary minimum heating value restriction to enable the significant heating value of sewage sludge to be captured and beneficially reused via incineration. Those sludges that are not incinerated and that are further dried and processed for burning in other combustion units would meet the proposed minimum Btu/lb criterion.

Second, EPA's determination that waste heat boilers do not qualify as "combustion unit[s] that recover[] energy" is arbitrary and does not recognize the significant value of waste heat boilers and their role in energy generation and beneficial use of sewage sludge. At the Southerly Plant, for example, four waste heat boilers have replaced the need for significant amounts of natural gas resulting in substantial reductions in air emissions and \$14 million in natural gas related cost saving over a 25 year period. Consistent with RCRA, this sewage sludge was burned to produce heat for boilers and is not discarded solid waste. EPA's reliance on the definition of energy recovery combustion units for hazardous waste management overlooks the fact that the Proposed Rule is focused on non-hazardous wastes, which can be burned with much less risk than hazardous wastes and can greatly reduce reliance on fossil fuels. Further, EPA's determination of what constitutes a legitimate fuel should not hinge on how the energy recovery is made. EPA's categorical exclusion of waste heat boilers as a legitimate energy recovery unit is too broad and must be eliminated or narrowed to ensure valuable renewable energy sources can remain in operation.

EPA is also proposing that non-hazardous secondary materials used as fuels be managed as valuable commodities. Proposed Rule § 241.3(d)(1)(i). NACWA believes sewage sludge meets this criterion based on a review of the factors listed in Section 241.3(d)(1)(i). Specifically, sewage sludge is not stored for unreasonable times. In fact, for most POTWs that practice incineration, there is no storage at all of the sewage sludge. Sludge is transferred directly to the SSI via pipe. An equalization tank may be used to dampen diurnal variation in sludge production, but there is no storage. Some agencies, including those that digest their sludge before incineration, may have storage capabilities, but SSIs are operated based on a constant, stable feed of sludge. Sludge handling and feed systems are managed as just another process stream in a steady-state wastewater treatment and incineration operation, with no storage required. Where storage is necessary for short periods, sewage sludge is adequately contained to prevent releases to the environment.

²² See 75 Fed. Reg. 31844, 31871.

2. The Proposed Contaminant Level Criterion Is Inadequate and EPA's Assessment of Sewage Sludge under this Criterion Is Flawed

In addition to meeting the heating value and management as a valuable commodity criteria, sewage sludge also meets the contaminant level criterion proposed by EPA. In the preamble to the Proposed Rule, however, EPA indicates that contaminant levels preclude sewage sludge from designation as a legitimate fuel. 75 Fed. Reg. 31844, 31867. NACWA's comments demonstrate that sewage sludge meets the contaminant level criterion as proposed and that EPA's determination that sewage sludge does not meet this criterion is based on outdated data. NACWA also believes that EPA's contaminant level criterion is too simplistic and excludes valuable, clean burning alternative materials from use as a legitimate fuel. Sewage sludge – a safe, organic fuel that has undergone a thorough risk assessment with its few contaminants currently regulated and evaluated – is a legitimate fuel.

(a) The Proposed Contaminant Level Criterion Is Inadequate

EPA is proposing a legitimacy criterion under which non-hazardous secondary materials used as fuels in combustion units must contain contaminants at levels that are comparable to those in traditional fuel products. Proposed Rule § 241.3(d)(1)(iii). According to the Agency, the contaminant level criterion “is necessary because non-hazardous secondary materials that contain contaminants that are not comparable in concentration to those contained in traditional fuel products or ingredients would *suggest* that these contaminants are being combusted as a means of discarding them.” 75 Fed. Reg. 31844, 31871-72 (emphasis added). The suggestion of an intent to discard is not sufficient to categorize an entire class of non-hazardous secondary material as a solid waste particularly when there is ample evidence that the material is used beneficially for energy recovery.

The application of this contaminant criterion to sewage sludge must also be reevaluated because the Proposed Rule is not predicated on any sewage sludge incinerator emissions data. If the burning of a non-hazardous secondary material replaces the use of a traditional fuel and has lower emissions than that traditional fuel, its use should be encouraged. EPA should assess the legitimacy of non-hazardous secondary materials as a fuel on the basis of emissions. The premise of EPA's Emission-Comparable Fuel Exclusion would work very well with non-hazardous secondary materials because EPA would not need to impose regulations that obliterate the usefulness of the exclusion. Because the materials dealt with here are non-hazardous, there would be none of the combustion and storage concerns that led to the recent withdrawal of the Emission-Comparable Fuel Exclusion Under RCRA for Hazardous Wastes.²³ It is only logical that a non-hazardous secondary material should be considered a legitimate fuel if emissions from an incinerator burning this material is comparable to the emissions from an industrial boiler burning traditional fuels.

(b) EPA's Assessment of Sewage Sludge under the Contaminant Level Criterion Is Flawed

²³ 75 Fed. Reg. 33712 (June 15, 2010) (Final Withdrawal); *see also* 74 Fed. Reg. 64643, 64647 (Dec. 8, 2009) (Proposed Withdrawal) (finding that the exclusions “require more resources and more attention from the regulatory agency than a subtitle C approach to reach a comparable level of assurance that appropriate combustion conditions are met” and that some hazardous wastes “pose a greater storage hazard than fuel oil”).

EPA's assessment of sewage sludge under the proposed contaminant criterion is based on outdated data and EPA must reevaluate its position in light of more recent data. EPA stated that it does not believe sewage sludge can meet the contaminant level criterion. 75 Fed. Reg. 31844, 31867 ("[M]unicipal sewage sludge contains metals that are typically higher in concentrations when compared to traditional fuels (e.g., coal and fuel oil) As such, the Agency does not believe that sewage sludge would meet the legitimacy criteria for contaminants."). EPA based this determination on one summary-level table, which contains sewage sludge contaminant levels from outdated sources.

EPA's flawed determination rests on the 1982 40 City Study and the 1988 National Sewage Sludge Survey (NSSS), not the much more recent 2006-2007 Targeted National Sewage Sludge Survey (TNSSS), which shows dramatically lower contaminant levels:

Element	40 City Study ²⁴ 1982	NSSS ²⁵ 1988	TNSSS ²⁶ 2006-2007	Coal ²⁷
	mg/dry kg			
Arsenic	9.9	6.7	6.9	10
Cadmium	69	6.9	2.6	0.5
Chromium	429	119	80	20
Lead	369	134.4	76	40
Mercury	2.8	5.2	1.2	0.1
Nickel	135.1	42.7	48	20
Selenium	7.3	5.2	7	1

Clearly, the older data do not reflect the significant advances in pretreatment, the decline of heavy polluting manufacturing processes, and the implementation of the Part 503 regulations in the mid-1990s, all of which make sewage sludge much cleaner for fuel purposes and protect public health. EPA's own documents acknowledge the significant reductions in pollutant loadings were made in the late 1980s and early 1990s – after the sewage sludge studies relied upon for the Proposed Rule were conducted.²⁸

EPA's flawed determination also overlooks the fact that sewage sludge quality is already heavily regulated by the CWA. The National Pretreatment Standards in Part 403 prevent the introduction of pollutants into POTWs and are meant to "improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges." 40 C.F.R. § 403.2. In addition, Part 503 regulations provide risk-based limits for incinerated sewage sludge contaminants and that the Agency has previously determined that when contaminant levels are below these limits, no significant public health or environmental risk exists.²⁹ Other non-hazardous secondary

²⁴ Cited by EPA at 75 Fed. Reg. 31867.

²⁵ *Id.*

²⁶ All values are based on the mean of aggregated samples from Appendix B-3 of the TNSSS Statistical Analysis Report available at <http://epa.gov/waterscience/biosolids/appendixb.pdf>.

²⁷ Cited by EPA at 75 Fed. Reg. 31867.

²⁸ OIG, *EPA Needs to Reinforce its National Pretreatment Program*, Report No. 2004-P-00030 (Sept. 28, 2004).

²⁹ 58 Fed. Reg. 9249 ("EPA is confident that the regulations it is promulgating today adequately protect public health and the environment from all reasonably anticipated adverse effects, as required by section 405(d), for several reasons" including that "even when sludge is incinerated and the population potentially exposed to the incinerator emissions is greater, the effects are small").

materials considered in the Proposed Rule do not have these highly researched and restrictive contaminant levels in place including the biomass group, construction and demolition materials, scrap tires, scrap plastics, spent solvents, coal refuse, and used oil. Through the Part 403 pretreatment program and the Part 503 regulations, sewage sludge contaminants are already managed to levels sufficient for sewage sludge to be classified as a legitimate fuel.

Further, when current sewage sludge contaminant level data is examined, there is no significant difference in the metal content of sewage sludge and traditional fuels. The coal contaminant values relied on by EPA do not demonstrate that coal contaminants are significantly lower than those in sewage sludge. In addition, the coal contaminant values, as presented by EPA, do not show the large range of contaminant levels in coal used for fuel. As stated in the Clarke and Sloss report from which the coal contaminant values were derived, “[t]race element concentrations vary enormously between coals from different sources, and even between coals from the same seams. The overall physical and chemical properties of a feed coal may be greatly altered by the mining, handling and cleaning processes prior to combustion or gasification.”³⁰ The “enormous” variability in coal contaminant values indicates that much of the coal combusted in the U.S. is likely to have one or more of the above contaminants at a higher concentration than the “typical” coal contaminant values EPA cites. When making its determination regarding contaminant levels, EPA also overlooked the variability in sewage sludge contaminant levels. Because contaminant concentrations vary from plant to plant due to differences in industrial loadings and background concentrations, it is inappropriate to categorize all sewage sludge based on mean contaminant values. Accordingly, EPA’s blanket determination that sewage sludge contains metals that are typically higher in concentration when compared to coal is flawed.

NACWA requests that EPA reevaluate the comparableness of sewage sludge to coal in light of the TNSSS survey. In addition, if necessary, EPA should consider a facility-by-facility determination of whether this criterion is met.

III. EPA Should Explicitly Limit the Scope of the Proposed Rule

NACWA and the regulated community are concerned that defining sewage sludge that is combusted as a solid waste in the Proposed Rule could have unintended effects on other forms of sewage sludge management, particularly at the state level. NACWA appreciates that EPA already has explicitly limited the purpose of the Proposed Rule to “identification of the requirements and procedures for the identification of solid wastes used as fuels or ingredients in combustion units under section 1004 of the Resource Conservation and Recovery Act and section 129 of the Clean Air Act.”³¹ While it appears to be EPA’s view that this Proposed Rule does not affect Part 503 and state analogs, there is, however, a potential that the Proposed Rule will affect the states’ ability to implement state biosolids management programs. There is also the potential that the Proposed Rule could lead to an unnecessary increase in lawsuits challenging other forms of sewage sludge management. Accordingly, if EPA decides not to exercise its discretion and exclude or exempt sewage sludge from its regulatory definition of non-hazardous solid waste for combustion, EPA must more explicitly state that the final rule has no regulatory effects or implications for sludge that is not incinerated.

Without clear and definitive limitations on the designation of sewage sludge as a solid waste for this rule only, state regulators may mistakenly modify or eliminate current exemptions that allow for beneficial use of

³⁰ Clarke, L.B. and Sloss, L.L., *Trace Elements-Emissions from Coal Combustion and Gasification*, International Energy Agency Report CR/49, London (1992), p. 26.

³¹ Proposed Rule § 241.1.

biosolids at the state level. Moreover, state regulators may react differently to implementation of the Proposed Rule because states allocate the responsibility for sewage sludge management to different divisions of each state's environmental agency. As of 2008, twenty-nine states regulate sewage sludge under the water program, eight states regulate sewage sludge under the solid waste program, and eight states regulate sewage sludge under both the water and solid waste programs.³²

States that exempt sewage sludge from regulation under their solid waste programs – relying expressly or implicitly on their understanding of a broad federal exemption – may face the most uncertainty.³³ Such states may be compelled to revoke the exemption and reclassify sewage sludge as solid wastes, which could significantly alter the state's sewage sludge management scheme. States that have created specific regulations for sewage sludge separate from the solid waste regulations may also face difficulties should the Proposed Rule be finalized as drafted.³⁴ Furthermore, for states that currently manage sewage sludge as a solid waste, there are questions regarding at what point in the treatment process sewage sludge becomes a solid waste and states could determine that RCRA obligations attach at different points in the treatment process. The current Proposed Rule only stands to further complicate these management questions.

Because of this uncertainty, NACWA requests that EPA more explicitly state that the final rule shall have no regulatory impact on sewage sludge that is not incinerated.

IV. The Domestic Sewage Exemption Prevents EPA from Regulating Sewage Sludge as a Solid Waste

Finally, NACWA believes the Domestic Sewage Exemption (DSE) in RCRA makes the Proposed Rule inapplicable to sewage sludge and that accordingly EPA lacks the legal authority to promulgate the rule. RCRA defines "solid waste" as:

any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but *does not include solid or dissolved material in domestic sewage . . .*

RCRA § 1004(27) (emphasis added). Accordingly, sewage sludge from POTWs is exempt from the definition of "solid waste" as "solid or dissolved material in domestic sewage." Through the DSE, Congress recognized that treated sewage sludge does not qualify as a solid waste. *See also* 40 C.F.R. 261.4(a)(1).

³² See 2008 NEBRA National Biosolids Regulation, Quality, End Use & Disposal Survey at 19 (5 states were not classified).

³³ See, e.g., Ohio Administrative Code 3745-27-03(A)(8)(b) (excluding land applied sewage sludge from regulation under the state solid waste rules and defining sewage sludge as "as a solid, semi-solid or liquid residue generated *during* the treatment of sewage in a treatment works") (emphasis added); North Carolina General Statutes 130A-290(c)(35)(b)(1) (excluding from the definition of solid waste "solid or dissolved material in [d]omestic sewage and sludges generated by treatment thereof in sanitary sewage collection, treatment and disposal systems which are designed to discharge effluents to the surface waters.").

³⁴ For example, in Minnesota, "waste" is defined in Minn. Stat. 115A.03, subd. 34 as "solid waste, sewage sludge and hazardous waste." Each term is then defined separately (Minn. Stat. 116.06, subd. 22, Minn. Stat. 115A.03 and Minn. Stat. 116.06, subd. 11, respectively), creating separate regulatory universes for each. Minn. R. chapters 7035, 7041 and 7045.

This concept of a broad POTW exemption was established by Congress as early as 1965 in the Solid Waste Disposal Act.³⁵ This 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 Solid Waste Disposal Act and RCRA included the Domestic Sewage Exclusion in explicit recognition of this critical policy choice.³⁶

Indeed, as EPA began its long efforts to define “solid waste” and “hazardous waste” for purposes of Subtitle C of RCRA, the Agency explicitly understood and discussed the importance of the comprehensive federal sewage sludge management program. For example, in the 1980 preamble to EPA’s development of the Subtitle C regulations, EPA describes the importance, scope and ultimate supremacy of the to-be developed CWA § 405 program, indicating that, once this program was in place, it would serve as the comprehensive regulations for use and disposal of sewage sludge. 45 Fed. Reg. 33084, 33102 (May 19, 1980) (“Once such a regulation is in place, sewage sludge will be exempted from coverage under other sets of regulations.”). EPA has similarly 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. EPA concluded that POTW sewage sludge falls within the DSE:

These wastes [P038 and K048 wastes] are being added to the list of [hazardous] wastes . . . in order to regulate sludges generated at wastewater treatment facilities on site at petroleum refineries as well as sludges generated at off-site wastewater treatment facilities.¹⁴ . . .

¹⁴ It should be noted 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* and are not included in today’s listings.

55 Fed. Reg. 46354, 46364 (Nov. 2, 1990) (emphasis added). Thus, 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.

Furthermore, when Congress incorporated RCRA’s definition of “solid waste” in CAA § 129 in 1990, Congress was well aware that the DSE was encompassed in the definition of “solid waste” and that CAA § 129 would not apply to sewage sludge. This statutory exemption for sewage sludge – the subject of broad consensus and reliance in the regulated community – can not be abrogated by subsequent rule making or preamble statements. Moreover, the 1987 CWA amendments and the subsequent Part 503 rules established a management program for sewage sludge dependent on its exclusion from RCRA regulation.

Lastly, the statutory and regulatory provisions that implement the sewage sludge management program distinguish between sewage sludge and solid waste, and thereby demonstrate that they are different types of material. For example, the preamble to the Part 503 rules states that:

³⁵ Solid Waste Disposal Act, Pub. L. 89-272, 79 Stat. 992 (1965).

³⁶ 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).

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. In keeping with the distinctions drawn by Congress between sewage sludge and solid waste, EPA's careful regulatory approach in the Part 503 regulations distinguishes between sewage sludge and solid waste.

The DSE under RCRA is implemented through and supported by the comprehensive programs for sewage sludge management that have been carefully developed under CWA § 405 and RCRA. The proposed abrogation of the DSE places RCRA regulatory responsibilities on POTWs that Congress fully intended would not apply due to strict regulation of POTWs under the CWA. Losing the DSE will "federalize" decisions over how sewage sludge must be managed, which directly contravenes Congress' preservation in the CWA of local control over sewage sludge management options.

* * *

In summary, NACWA requests that EPA:

1. Exercise its discretion and exclude or exempt sewage sludge that is combusted from the final rule's definition of non-hazardous solid waste.
2. Recognize that sewage sludge and scum are legitimate fuels.
3. Classify the energy recovery and energy production devices employed by POTWs as legitimate energy recovery systems.
4. Clearly state that the rule does not apply to and will not impact other sewage sludge management options regulated under Part 503.

Please contact Chris Hornback at chornback@nacwa.org or 202-833-9106 with any questions regarding NACWA's comments.

Sincerely,



Ken Kirk
Executive Director

Attachments

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EXECUTIVE DIRECTOR

Ken Kirk

November 18, 2010

Peter Tsirigotis

Director

Sector Policies and Programs Division

Office of Air Quality Programs and Standards

U.S. Environmental Protection Agency

Mail Code D205-01

Research Triangle Park, NC 27711

Dear Peter,

The National Association of Clean Water Agencies (NACWA) respectfully requests a thirty (30) day extension of time for submitting written comments in response to the proposed *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration (SSI) Units* (Proposed Standards) published by the Environmental Protection Agency (EPA) in the *Federal Register* on October 14, 2010 (75 *Fed. Reg.* 63260). NACWA represents the interests of the nation's publicly owned wastewater treatment agencies. For many communities, incineration continues to be the top choice for managing sewage sludge. NACWA is very concerned about the impact the proposed new source performance standards and emission guidelines will have on the already limited options local governments have for managing sludge, and believes more time is needed to ensure the proposed rule accurately reflects current emission levels and the costs associated with meeting the limits.

Wastewater utilities have only three main management options for sewage sludge – land application, landfill, and incineration. Approximately 20 percent of the sludge generated annually in the United States is managed via incineration. After careful consideration of the other management alternatives, cost, and environmental impact, utilities that incinerate chose to design their plant and treatment operations based on an understanding that incineration was the best option for their community. EPA's proposal assumes that some of these communities will abandon the capital investments they have made in their SSIs and instead send their sludge to a landfill. For those who choose to upgrade their units, EPA has estimated the cost at over



\$200 million. While NACWA believes this figure significantly underestimates the true costs that will be borne by these municipalities, even this estimate underscores the significance of the proposal. Forty-five days to review a rule of this magnitude is simply insufficient.

Based on even the cursory review that we have been able to conduct so far on the voluminous background materials supporting EPA's rule, there are a number of incorrect assumptions that have been made, a systemic overestimation of baseline emissions, and errors in the costs for landfilling that could increase those estimates by a factor of four. The municipal wastewater community must have enough time to complete its review of these materials in order to provide the Agency with meaningful input.

NACWA understands the realities of court-ordered deadlines, but also understands that EPA can ask for more time from the court. Executive Order 12866 directs agencies like EPA to "afford the public a meaningful opportunity to comment on any proposed regulation, which in most cases should include a comment period of not less than 60 days." Given the technical nature of this proposal and the potential impact, NACWA believes the Agency should at a minimum provide a total of 60 days for public comment on the Proposed Standards. NACWA believes that providing an appropriate comment period for a rule of such magnitude is a compelling reason to seek an extension of the court-ordered deadline.

Thank you for considering NACWA's request for a thirty day extension to the comment period. At a minimum, NACWA believes EPA should extend the November 29, 2010 deadline by 15 days to provide for a 60-day comment period on the Proposed Standards.

Sincerely,

A handwritten signature in black ink, appearing to read "K Kirk".

Ken Kirk
Executive Director

cc: Robin Dunkins, OAQPS
Amy Hambrick, OAQPS
Susmita Dubey, OGC