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PART I: INTRODUCTION

This document supports the Final 2008 Effluent Guidelines Program Plan. It presents the methodology used to perform the annual reviews of industrial discharges required by the Clean Water Act and the results of the reviews.

1.0 BACKGROUND

This section explains how the Effluent Guidelines Program fits into the Clean Water Act (CWA) Program, describes the general and legal background of the Effluent Guidelines Program, and describes EPA's process for making effluent guidelines revision and development decisions (i.e., effluent guideline planning).

1.1 EPA's Clean Water Act Program

EPA's Office of Water is responsible for developing the programs and tools authorized under the CWA, which provides EPA and the states with a variety of programs and tools to protect and restore the Nation's waters. These programs and tools generally rely either on water quality-based controls, such as water quality standards and water quality-based effluent limitations, or technology-based controls such as effluent guidelines and technology-based effluent limitations.

The CWA gives states the primary responsibility for establishing, reviewing, and revising water quality standards. These consist of designated uses for each water body (e.g., fishing, swimming, supporting aquatic life), numeric pollutant concentration limits ("criteria") to protect those uses, and an antidegradation policy. EPA develops national criteria for many pollutants, which states may adopt or modify as appropriate to reflect local conditions. In a parallel track to water quality standards, EPA also develops technology-based effluent limitation guidelines and standards, which are factor-based regulations that provide effluent limits based on current available technologies. These limitations and standards are then incorporated into discharge permits as technology-based effluent limitations (U.S. EPA, 1996). While technology-based effluent limitations in discharge permits may be as stringent as or more stringent than water quality-based effluent limits, the effluent guidelines program is not specifically designed to ensure that the discharge from each facility meets the water quality standards for that particular water body. For this reason, the CWA also requires states to establish water quality-based permit limitations, where necessary to attain and maintain water quality standards that require industrial facilities to meet requirements that are more stringent than those in a national effluent guideline regulation. EPA notes that the various components of water quality-based permitting (water quality standards, water quality-based effluent limits, and total maximum daily loads) are in different stages of development nationally and by state, which may result in different levels of protection across states. Therefore, national categorical effluent limitations and standards remain a critical component of EPA's CWA Program. Consequently, in the overall context of the CWA, effluent guidelines must be viewed as one tool in the broad arsenal of tools Congress provided to EPA and the states to protect and restore the Nation's water quality.

1.2 Background on the Effluent Guidelines Program

The 1972 CWA marked a distinct change in Congress's efforts "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." See CWA § 101(a), 33 U.S.C. § 1251(a). Prior to 1972, the CWA relied on "water quality standards." This approach was challenging, however, because it was very difficult to prove that a specific discharger was responsible for decreasing the water quality of its receiving stream.

Since 1972, the CWA has directed EPA to promulgate effluent guidelines that reflect pollutant reductions that can be achieved by categories or subcategories of industrial point sources. The effluent guidelines are based on specific technologies (including process changes) that EPA identifies as meeting the statutorily prescribed level of control. See CWA sections 301(b)(2), 304(b), 306, 307(b), and 307(c). Unlike other CWA tools, effluent guidelines are national in scope and establish pollution control obligations for all facilities that discharge wastewater within an industrial category or subcategory. In establishing these controls, EPA assesses: (1) the performance and availability of the best pollution control technologies or pollution prevention practices that are available for an industrial category or subcategory as a whole; (2) the economic achievability of those technologies, which can include consideration of costs, effluent reduction benefits, and affordability of achieving the reduction in pollutant discharge; (3) non-water-quality environmental impacts (including energy requirements); and (4) such other factors as the Administrator deems appropriate.

Creating a single national pollution control requirement for each industrial category based on the best technology the industry could afford was seen by Congress as a way to reduce the potential creation of “pollution havens” and to set the Nation’s sights on attaining the highest possible level of water quality. Consequently, EPA’s goal in establishing national effluent guidelines is to assure that industrial facilities with similar characteristics, regardless of their location or the nature of their receiving water, will at a minimum meet similar effluent limitations representing the performance of the best pollution control technologies or pollution prevention practices.

Unlike other CWA tools, effluent guidelines also provide the opportunity to promote pollution prevention and water conservation. This may be particularly important in controlling persistent, bioaccumulative, and toxic pollutants discharged in concentrations below analytic detection levels. Effluent guidelines also control pollutant discharges at the point of discharge from industrial facilities and cover discharges directly to surface water (direct discharges) and discharges to publicly-owned treatment works (POTWs) (indirect discharges). For industrial dischargers to POTWs, this can have the added benefit of preventing the untreated discharge of pollutants to groundwater from leaking sewer pipes or to surface waters due to combined sewer overflows.

1.3 What Are Effluent Guidelines and Pretreatment Standards?

The national clean water industrial regulatory program is authorized under sections 301, 304, 306 and 307 of the CWA.

The CWA directs EPA to promulgate effluent limitations guidelines and standards through six levels of control: BPT, BAT, BCT, NSPS, PSES, and PSNS. For point sources that discharge pollutants directly into the waters of the United States (direct dischargers), the limitations and standards promulgated by EPA are implemented through National Pollutant Discharge Elimination System (NPDES) permits. See CWA sections 301(a), 301(b), and 402. For sources that discharge to POTWs (indirect dischargers), EPA promulgates pretreatment standards that apply directly to those sources and are enforced by POTWs and state and federal authorities. See CWA sections 307(b) and (c). Figure 1-1 illustrates the relationship between the regulation of direct and indirect dischargers.

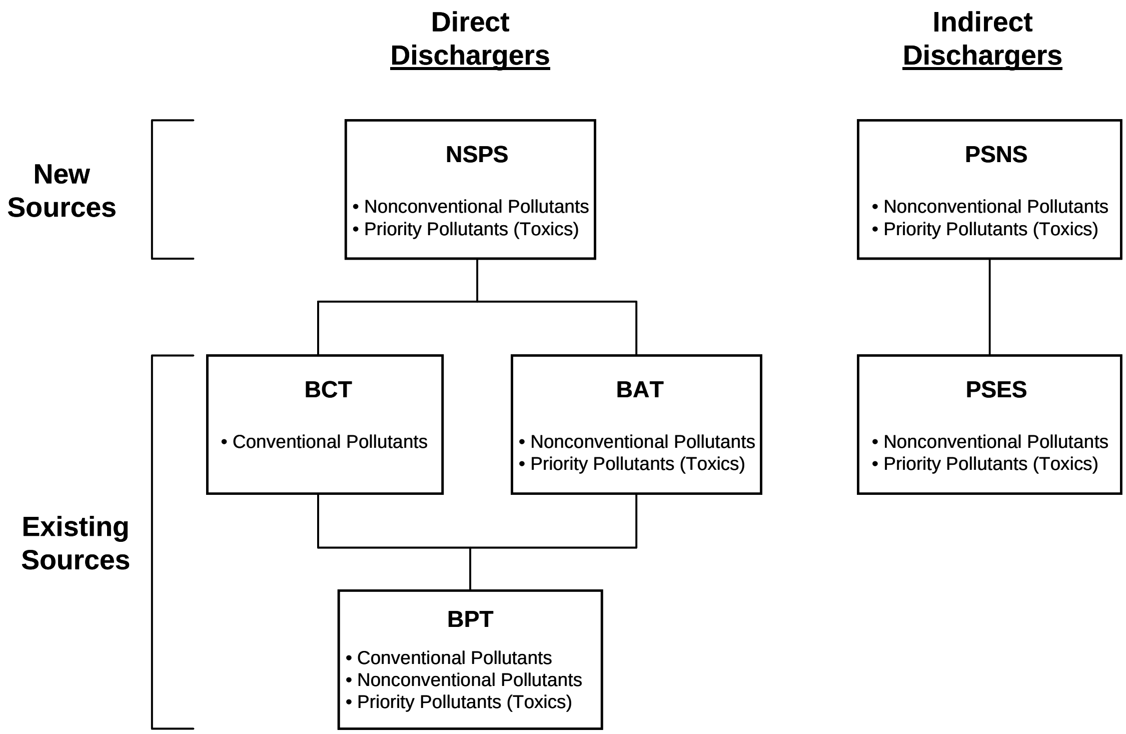


Figure 1-1. Regulations of Direct and Indirect Wastewater Discharges Under NPDES

1.3.1 Best Practicable Control Technology Currently Available (BPT) — CWA Sections 301(b)(1)(A) and 304(b)(1)

EPA develops effluent limitations based on BPT for conventional, toxic, and nonconventional pollutants. Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD_5), total suspended solids, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979. See 44 FR 44501 (July 30, 1979). EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. See Appendix A to Part 423, reprinted after 40 CFR Part 423.17. All other pollutants are considered to be nonconventional.

In specifying BPT, EPA looks at a number of factors. EPA first considers the total cost of applying the control technology in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed and any required process changes, engineering aspects of the control technologies, non-water-quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate. See CWA section 304(b)(1)(B). Traditionally, EPA establishes BPT effluent limitations based on the average of the best performances of facilities within the industry of various ages, sizes, processes or other common characteristics. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied.

1.3.2 Best Conventional Pollutant Control Technology (BCT) — CWA Sections 301(b)(2)(E) and 304(b)(4)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT for discharges from existing industrial point sources. In addition to the other factors specified in section 304(b)(4)(B), the CWA requires that EPA establish BCT limitations after consideration of a two-part "cost-reasonableness" test. EPA explained its methodology for the development of BCT limitations in 1986. See 51 FR 24974 (July 9, 1986).

1.3.3 Best Available Technology Economically Achievable (BAT) — CWA Sections 301(b)(2)(A) and 304(b)(2)

For toxic pollutants and nonconventional pollutants, EPA promulgates effluent guidelines based on BAT. See CWA sections 301(b)(2)(C), (D), and (F). The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, non-water-quality environmental impacts, including energy requirements, and other such factors as the EPA Administrator deems appropriate. See CWA section 304(b)(2)(B). The technology must also be economically achievable. See CWA section 301(b)(2)(A). The Agency retains considerable discretion in assigning the weight it accords to these factors. BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a particular subcategory based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

1.3.4 New Source Performance Standards (NSPS) — CWA Section 306

NSPS reflect effluent reductions that are achievable based on the best available demonstrated control technology. New sources have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent controls attainable through the application of the best available demonstrated control technology for all pollutants (i.e., conventional, nonconventional, and priority pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water-quality environmental impacts and energy requirements.

1.3.5 Pretreatment Standards for Existing Sources (PSES) — CWA Section 307(b)

PSES apply to indirect dischargers, and are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including sludge disposal methods at POTWs. Pretreatment standards are technology-based and are analogous to BAT effluent limitations guidelines.

The General Pretreatment Regulations, which set forth the framework for implementing national pretreatment standards, are found at 40 CFR Part 403.

1.3.6 Pretreatment Standards for New Sources (PSNS) — CWA Section 307(c)

Like PSES, PSNS apply to indirect dischargers, and are designed to prevent the discharges of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. PSNS are to be issued at the same time as NSPS. New indirect dischargers have the opportunity to incorporate into their plants the best available demonstrated technologies. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

1.4 Success of EPA's Effluent Guidelines Program

The effluent guidelines program has helped reverse the water quality degradation that accompanied industrialization in this country. Permits developed using the technology-based industrial regulations are a critical element of the Nation's clean water program and reduce the discharge of pollutants that have serious environmental impacts, including pollutants that:

- Kill or impair fish and other aquatic organisms;
- Cause human health problems through contaminated water, fish, or shellfish; and
- Degrade aquatic ecosystems.

EPA has issued effluent guidelines for 56 industrial categories and these regulations apply to between 35,000 and 45,000 facilities that discharge directly to the Nation's waters, as well as another 12,000 facilities that discharge to POTWs. These regulations have prevented the discharge of more than 1.2 billion pounds of toxic pollutants each year.

1.5 What Are EPA's Effluent Guidelines Planning and Review Requirements?

The CWA also requires EPA to annually review existing effluent guidelines. EPA reviews all point source categories subject to existing effluent guidelines and pretreatment standards to identify potential candidates for revision, as required by CWA sections 304(b), 301(d), 304(g), and 307(b). EPA also reviews industries consisting of direct discharging facilities not currently subject to effluent guidelines to identify potential candidates for effluent guidelines rulemakings, as required by CWA section 304(m)(1)(B). Finally, EPA reviews industries consisting entirely or almost entirely of indirect discharging facilities that are not currently subject to pretreatment standards to identify potential candidates for pretreatment standards development, as required by CWA sections 304(g) and 307(b). CWA section 304(m) requires EPA to publish an effluent guidelines program plan every two years. As part of the development of this plan, the public is provided an opportunity to comment on a "preliminary" plan before it is finalized. EPA publishes the preliminary plan on a two-year schedule followed by the final effluent guidelines program plan in the succeeding years. The preliminary plan is published in odd-numbered years and the final plan is published in even-numbered years.

1.6 Background References

1. U.S. EPA. 1996. *U.S. EPA NPDES Permit Writers' Manual*. Washington, DC. (December). EPA-833-B-96-003. Available online at: http://cfpub.epa.gov/npdes/writermanual.cfm?program_id=45.

2.0 PUBLIC COMMENTS ON THE FINAL EFFLUENT GUIDELINES PROGRAM PLAN FOR 2006 AND PRELIMINARY EFFLUENT GUIDELINES PROGRAM PLAN FOR 2008

EPA published its Preliminary 2008 Effluent Guidelines Program Plan (2008 Preliminary Plan) on October 30, 2007 (72 FRN 61335) and requested comments on various aspects of its analyses, data, and information to inform its 2008 annual review and four detailed studies.

Comments EPA received on the 2006 Final Plan and on the 2008 Preliminary Plan are located in EPA Docket Number EPA-HQ-OW-2006-0771 (available at http://www.regulations.gov). Commenters' names and issues they raised during these comment periods are listed in this section.

The Agency received 36 comments on the 2006 Final Plan and 2008 Preliminary Plan from a variety of commenters including industry and industry trade associations, municipalities and sewerage agencies, environmental groups, and other advocacy groups, private citizens, federal agencies, and state government agencies. Stakeholders' suggestions played a significant role in both the 2007 and 2008 annual reviews. Table 2-1 lists all the commenters as well as a synopsis of the comments.

Table 2-1. Comments on the Preliminary 2008 and Final 2006 Effluent Guidelines Program Plans
EPA Docket Number: EPA-HQ-OW-2006-0771

No.	Commenter Name	EPA E-Docket No.	Comment Summary
1	Gregory E. Conrad Interstate Mining Compact Commission (IMCC)	0002	General comments in favor of the Coal Mining Detailed Study. Recommends that EPA focus on a review of manganese effluent guidelines and not focus on those pollutants not currently regulated by the Coal Mining Effluent Guidelines (e.g., sulfates, chlorides and TDS).
2	William J. Walsh Pepper Hamilton, LLP (American Dental Association)	0003 (also see 0837)	General comments on the Health Services Detailed Study. Recommends that EPA collect more data and conduct additional analyses before requiring the universal and mandatory use of amalgam separators.
3	Beverly B. Head Metropolitan Sewer District of Greater Cincinnati, Ohio	0004	Provides information for the Health Services Detailed Study. States that, "the District's history with the Health Services Industry is that this group generally complies with all local limits for metals and organics. However, pH noncompliance does occur and appears to be tied to integrated laundries and laboratories serving the industry."
4	Joseph Pizarchik, Pennsylvania Department of Environmental Protection, Bureau of Mining and Reclamation	0005	General comments in favor of the Coal Mining Detailed Study. States that, "if the current standards are not necessary for protection of public health and the environment, they are posing an undue burden on The Commonwealth of Pennsylvania and anyone else who is responsible for treating mine drainage."
5	David J. Knight P.E., Southwest Regional Office, Water Quality Program, Washington State Department of Ecology	0823	General comments providing data and recommendations for multiple industrial categories. Recommends the review of discharges from the following industries: boilers and cooling towers, food processing (brewing beer and wine), petroleum refining, steam electric and electrical and electronics. Recommends using WET testing instead of TWFs and supports pretreatment standards for hospitals.
6	Allen Gilliam, Pretreatment Coordinator, Arkansas Department of Environmental Quality	0824	Provided information on an alternative pharmaceuticals disposal technology: non-incineration pyrolysis technology for destruction of unused pharmaceuticals in Western Canada (vendor is Phase Separation Solutions Inc.).
7	Nancy Busen, City of Bentonville, AR Lab/Pretreatment Supervisor	0825	Expressed need for hospice and home health care disposal programs.
8	Elizabeth Aldridge and Donna Hill, UWAG	0826	Requested extension to comment period.

Table 2-1. Comments on the Preliminary 2008 and Final 2006 Effluent Guidelines Program Plans
EPA Docket Number: EPA-HQ-OW-2006-0771

No.	Commenter Name	EPA E-Docket No.	Comment Summary
9	Gus Changaris, EXP Unused Pharmaceuticals Corp.	0827	Provided information on pharmaceutical return-for-credit programs, waste disposal needs of pharmacy facilities, the need to remove unused pharmaceuticals from waste streams, example BMPs, and controlled substance/reverse distribution problems.
10	Martina Nelson, P.E. and Leo Hermes, P.E., Metropolitan Council Environmental Services (MCES)	0828	Provided data on wastewater for several industries, including: dental, healthcare, and CWT. Recommended that EPA consider: eliminating Part 413 (Electroplating) and regulate under Part 433 (Metal Finishing); revise Part 403 so that Non Significant Categorical Industrial Users (NSCIUs) are subject to POTW Local Limits only (exempt from categorical pretreatment standards), establish PSES for Metal Molding and Casting (Zinc Category). Provided general comments on plan approach: prefer guidance over new ELGs. Recommends no review of indirect discharges (which are covered by local limits); recommends focusing on non-point sources.
11	Bruce E. Cunha RN MS COHN-S, Manager, Employee Health, Safety, and Infection Prevention/Control, Marshfield Clinic, Marshfield, WI	0829	Provided data related to unused pharmaceutical disposal: costs, BMPs, take-back programs, community "clean sweep" programs, and state regulations.
12	Roger E. Claff, P.E., American Petroleum Institute (API)	0831	Provides several recommendations: commends use of QAPP for TRI and PCS databases; recommends assessment and documentation of treatment technologies; study, not regulation of, industries with high TWPE; consideration of concentrations in addition to loading, in terms of TWPE; minimization of workload for CBM questionnaire.
13	Louis Kollias, Metropolitan Water Reclamation District of Greater Chicago	0832	Provides information on their history of unused pharmaceutical disposal.
14	Donna Hill, UWAG	0833	Requested extension to comment period.
15	Linda Eichmiller, ASIWPCA	0834	Recommends considering the effects of nutrients and treatment technologies.
16	Mark Taratoot, Corvallis, OR Public Works Department	0835	Provides feedback on how the DEA and law enforcement affect disposal practices.
17	Thomas W. Curtis, AWWA	0836	Recommends how to identify new industries for pretreatment regulations: focus on nutrients and pathogens and clarify role of planning process.

Table 2-1. Comments on the Preliminary 2008 and Final 2006 Effluent Guidelines Program Plans
EPA Docket Number: EPA-HQ-OW-2006-0771

No.	Commenter Name	EPA E-Docket No.	Comment Summary
18	William Walsh, Pepper Hamilton LLP (American Dental Association)	0837 (also see 0003)	Provides information from the ADA on dental amalgam: BMPs, regulations, history, voluntary programs, industry profile, costs and effectiveness of technologies, and amalgam separator effectiveness and use.
19	Stan Dempsey, Jr., Colorado Petroleum Association (CPA)	0840, 0842, 0858	Recommends that EPA "right size" the CBM survey to reduce burden, involve and collect data from state agencies, and consider basin-specific differences in technology and reuse.
20	Michael P. Walls	0843, 0859	Provided recommendations on EPA's review methodology and specific comments on industries: support continued evaluation of TWF determination; TRI/PCS databases overestimate discharges from OCPSF; no further review needed for CWTs/Waste Combustors; and no regulation is needed for co-generation facilities.
21	Will Perry and Kathleen Klein, Public Health/Seattle & King County	0844	Provided data on unused pharmaceuticals: generation rates, disposal methods, hazardous waste management, leachate, return/take-back programs, and residential consumer issues.
22	Janet Gillaspie — Executive Director, Oregon Association of Clean Water Agencies (ACWA)	0845	Provided data on dental amalgam and unused pharmaceuticals: BMPs, state/local regulations, voluntary programs, effectiveness, pass through, pharmaceutical disposal concerns, and disposal methods.
23	Beryl B. Fletcher, Oregon Dental Association	0846	Provided data on dental amalgam: BMPs, performance of BMPs, recycling resources, and mercury collection events.
24	Christopher Sproul, Attorney for Ecological Rights Foundation and Our Children's Earth Foundation	0847, 0854	Restated issues in the ongoing litigation of *Our Children's Earth Foundation, et al. v. U.S. EPA.*
25	Christopher Sproul, Environmental Advocates	0848	Concurred with Ecological Rights Foundation and Our Children's Earth Foundation comments.
26	Cynthia A. Finley, NACWA	0849	Provided data on dental mercury: removals at POTWs, content in effluent/biosolids, technology effectiveness, and cost/benefits. Also commented that pretreatment standards are not preferred.
27	Paul Chu, EPRI	0850	Provided data related to discharges from steam electric facilities: IGCC facilities information, environmental assessments/inputs information (TRUE Model), TRUE multimedia risk assessment model, and case studies.

Table 2-1. Comments on the Preliminary 2008 and Final 2006 Effluent Guidelines Program Plans
EPA Docket Number: EPA-HQ-OW-2006-0771

No.	Commenter Name	EPA E-Docket No.	Comment Summary
28	Michael Garvin, PhRMA	0851	Provided data on unused pharmaceuticals: disposal practices, barriers preventing the reduction of unused pharmaceuticals to POTWs or surface water, efforts with the DEA, BMPs, and fate of unused pharmaceuticals that go to landfills.
29	Charlotte A. Smith, PharmEcology Associates, LLC	0852	Provided data on the driving force of disposal practices in hospitals, state regulations and programs, work with the DEA, and BMPs.
30	Liz Aldridge, UWAG	0853, 0862	Provided comments on EPA's ongoing detailed study of the steam electric industry.
31	Sheila Lockwood, Environmental Health and Safety Coordinator University of Washington Seattle, WA	0855	Provided data on dental amalgam: links to regulations, data on mercury reductions in biosolids from amalgam separators, and education and outreach materials. Also provided data on unused pharmaceuticals: links to guidance, BMPs, discharge authorization programs, and trial medicine take-back programs.
32	Diana Klemans, The Michigan Department of Environmental Quality	0856	Recommended regulation of phosphorus discharges from POTWs and national categorical pretreatment standards for unused pharmaceuticals and other personal care products.
33	Larry Lamperti, City of Corvallis, OR	0857	Provided data on BMPs: City's effluent mercury before and after BMPs, POTW implementation costs, and example BMPs.
34	Christie True, King County Water Treatment Division	0860	Provided comments on dental amalgam and unused pharmaceuticals: does not support national pretreatment standards; supports voluntary initiatives; and provides data on success of their programs.
35	Thomas P. Uva, Narragansett Bay Commission (NBC)	0861	Provided data on dental amalgam BMPs. Also does not recommend any new federal categorical pretreatment standards because local limits suffice.
36	Paul Martyn, LA County	1059	Supported EPA studying health services dental amalgam and unused pharmaceuticals: need for amalgam separators and take-back programs for unused pharmaceuticals.

3.0 THE EFFLUENT GUIDELINES PLANNING PROCESS

This section provides a general overview of the process EPA uses to identify industrial categories for potential development of new or revised effluent limitations guidelines and pretreatment standards (ELGs) in 2007 and 2008. This process consists of: (1) annual review of existing ELGs to identify candidates for revision; (2) identification of new categories of direct dischargers for possible development of effluent guidelines; and (3) identification of new categories of indirect dischargers for possible development of pretreatment standards. Each of these components is illustrated in Figures 3-1 through 3-3 and discussed below.

3.1 Goals of the ELG Planning Process

In the effluent guideline planning process, EPA is guided by the following goals:

- Restore and maintain the chemical, physical, and biological integrity of the Nation's waters; and
- Provide transparent decision-making and involve stakeholders early and often during the planning process.

3.2 Annual Review of Existing Effluent Guidelines and Pretreatment Standards

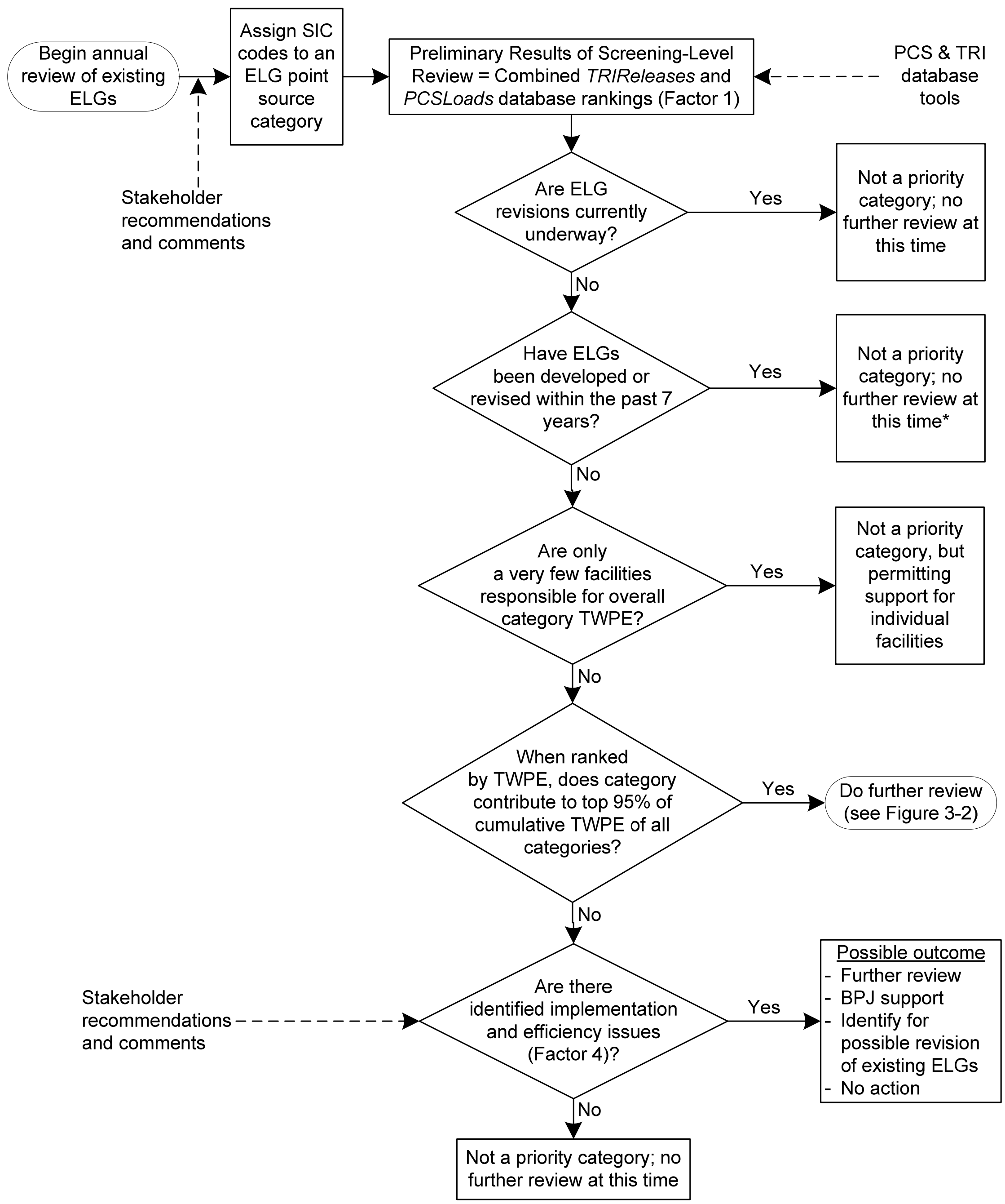
This section describes the four factors used (Section 3.2.1) and how they are used (Section 3.2.2) in the annual review of existing effluent guidelines and pretreatment standards.

3.2.1 Factors Considered in Review of Existing Effluent Guidelines and Pretreatment Standards

EPA uses four major factors in prioritizing existing effluent guidelines or pretreatment standards for possible revision.

The first factor EPA considers is the amount and type of pollutants in an industrial category's discharge, and the relative hazard posed by that discharge. This enables the Agency to set priorities for rulemaking to achieve the greatest environmental and health benefits. EPA estimates the toxicity of pollutant discharges in terms of toxic-weighted pound equivalents (TWPE), discussed in detail in Section 4.1.3. To assess the effectiveness of pollution control, EPA examines the removal of pollutants, in terms of pounds and TWPE.

The second factor EPA considers is the performance and cost of applicable and demonstrated wastewater treatment technologies, process changes, or pollution prevention alternatives that could effectively reduce the pollutants in the industrial category's wastewater and, consequently, reduce the hazard to human health or the environment associated with these pollutant discharges.



*If EPA is aware of new segment growth within such a category or new concerns are identified, EPA may do further review.

Figure 3-1. Flow Chart of Annual Review of Existing ELGs

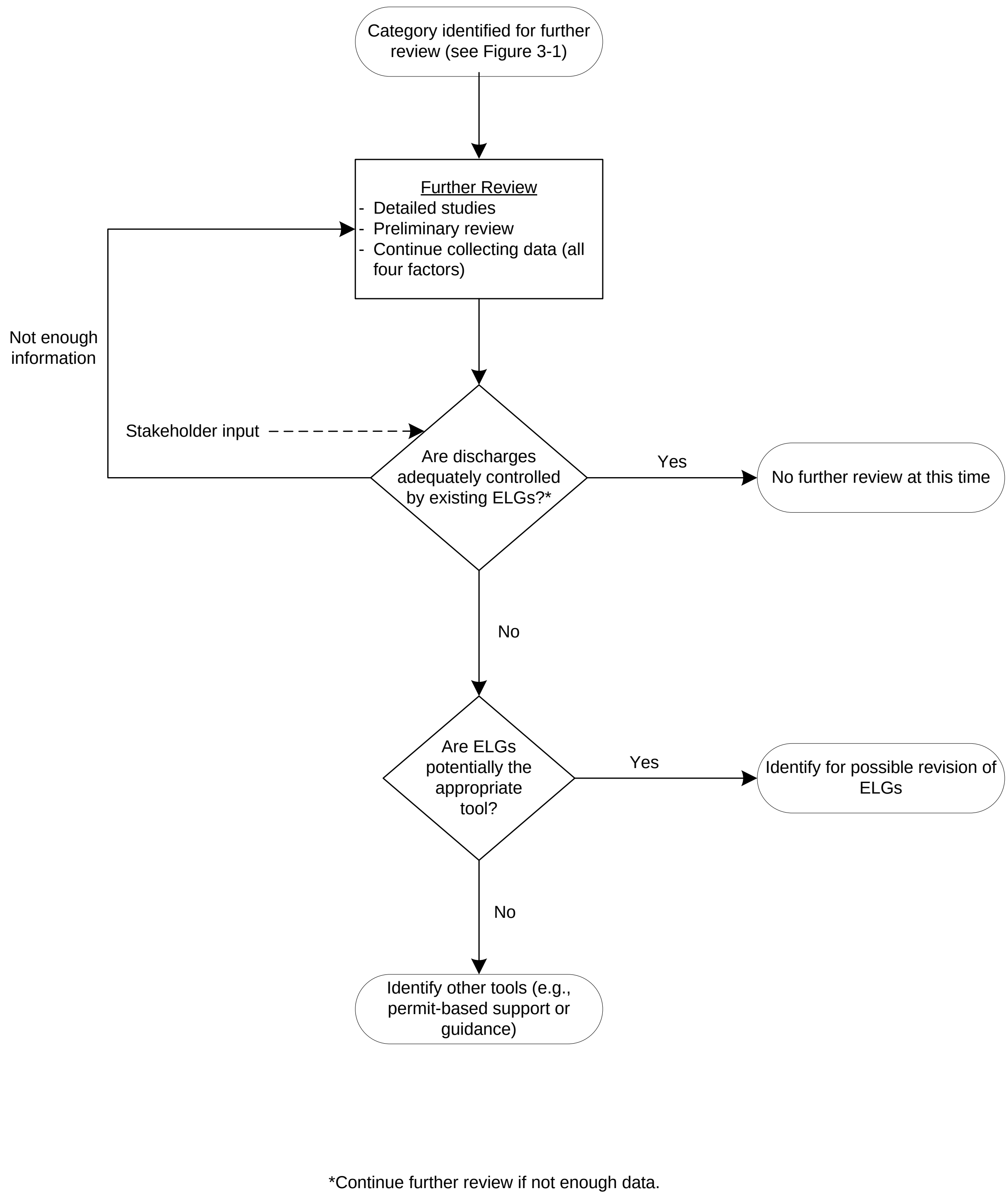
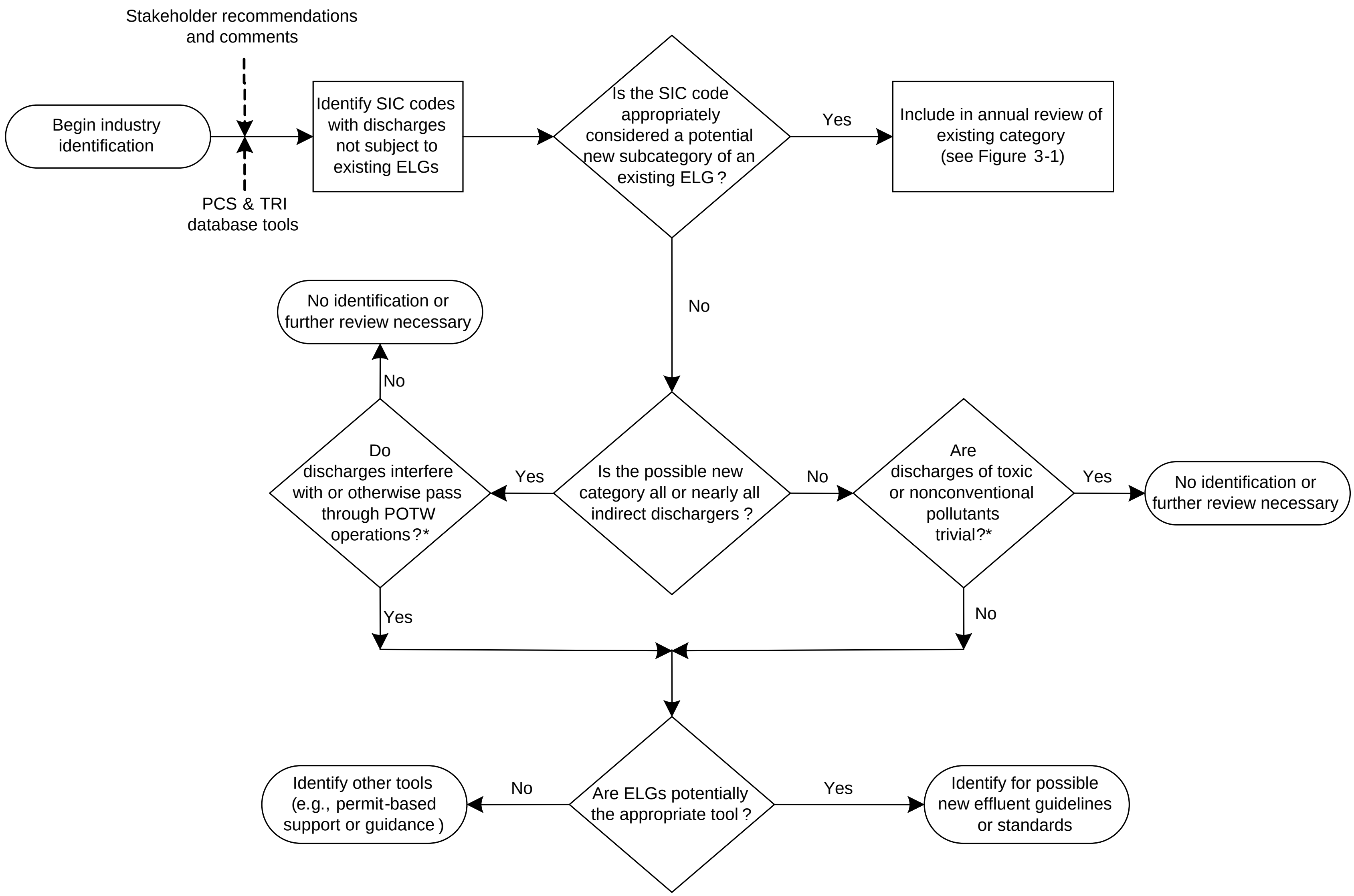


Figure 3-2. Flow Chart of Further Review of Existing ELGs



*Continue further review if not enough data.

Figure 3-3. Flow Chart of Identification of Possible New ELGs

The third factor EPA considers is the affordability or economic achievability of the wastewater treatment technology, process change, or pollution prevention measures identified using the second factor. If the financial condition of the industry indicates that it would be difficult to implement new requirements, EPA might conclude that it would be more cost-effective to develop less expensive approaches to reducing pollutant loadings that would better satisfy applicable statutory requirements.

The fourth factor EPA considers is an opportunity to eliminate inefficiencies or impediments to pollution prevention or technological innovation, or opportunities to promote innovative approaches such as water quality trading, including within-plant trading. This factor might also prompt EPA, during an annual review, to decide against identifying an existing set of effluent guidelines or pretreatment standards for revision where the pollutant source is already efficiently and effectively controlled by other regulatory or nonregulatory programs.

3.2.2 Overview: Review of Existing Point Source Categories

EPA has established ELGs to regulate wastewater discharges from 56 point source categories. EPA must annually review the ELGs for all of these categories. EPA first does a screening-level review of all categories subject to existing ELGs. EPA then conducts further review of categories prioritized as a result of the screening-level review. This further review consists of either an in-depth "detailed study" or a somewhat less detailed "preliminary category review." Based on this further review, EPA identifies existing categories for potential ELGs revision.

3.2.2.1 Screening-Level Review

The screening-level review is the first step in EPA's annual review. Section 4.0 provides details on the database methodology used in the screening-level review. EPA uses this step to prioritize categories for further review. In conducting the screening-level review, EPA considers the amount and toxicity of the pollutants in a category's discharge and the extent to which these pollutants pose a hazard to human health or the environment (Factor 1).

EPA conducts its screening-level review with data from the Toxics Release Inventory (TRI) and Permit Compliance System (PCS). The *Quality Assurance Project Plan for the 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describes the quality objectives EPA used with the TRI and PCS data in more detail (ERG, 2007a). TRI and PCS do not list the effluent guideline(s) applicable to a particular facility. However, they both include information on a facility's Standard Industrial Classification (SIC) code. Therefore, the first step in EPA's screening-level review is to assign each SIC code to an industrial category.[1] EPA then uses the information reported in TRI and PCS, for a specified year, in combination with toxic weighting factors (TWFs)[2] to calculate the total discharge of toxic and nonconventional pollutants (reported in units of toxic-weighted pound equivalent or TWPE) for each facility in a category for that year. For indirect dischargers, EPA adjusts this facility-specific value to account for removals at the POTW. EPA then sums the TWPE for each facility

[1] For more information on EPA's assignment of each SIC code to an industrial category, see Section 5.0 of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005).
[2] For more information on Toxic Weighting Factors, see Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process (U.S. EPA, 2006).

in a category to calculate a total TWPE per category for that year. EPA calculates two TWPE estimates for each category: one based on data in TRI and one based on data in PCS. EPA combined the estimated discharges of toxic and nonconventional pollutants calculated from the TRI and PCS databases to estimate a single TWPE value for each industrial category. EPA took this approach because it found that combining the TWPE estimates from the TRI and PCS databases into a single TWPE number offered a clearer perspective of the industries with the most toxic pollution.[3]

EPA then ranks point source categories according to their total TWPE discharges. In identifying categories for further review, EPA prioritizes categories accounting for 95 percent of the cumulative TWPE from the combined databases (see Section 5.3). EPA also excludes from further review categories for which effluent guidelines had been recently promulgated or revised (within the past seven years), or for which an effluent guidelines rulemaking is currently underway. EPA chose seven years because this is the time it customarily takes for the effects of effluent guidelines or pretreatment standards to be fully reflected in pollutant loading data and TRI reports. EPA also considers the number of facilities responsible for the majority of the estimated toxic-weighted pollutant discharges associated with an industrial activity. Where only a few facilities in a category account for the vast majority of toxic-weighted pollutant discharges, EPA typically does not prioritize the category for additional review. In this case, EPA believes that revising individual permits may be more effective in addressing the toxic-weighted pollutant discharges than a national effluent guidelines rulemaking because requirements can be better tailored to these few facilities, and because individual permitting actions may take considerably less time than a national rulemaking.

3.2.2.2 Further Review

Following its screening-level review of all point source categories, EPA prioritizes certain categories for further review. The purpose of the further review is to determine whether it would be appropriate for EPA to identify in the final plan a point source category for potential effluent guidelines revision. EPA typically conducts two types of further review: detailed studies and preliminary reviews. EPA selects categories for further review based on the screening-level review and/or stakeholder input.

EPA's detailed studies generally examine the following: (1) wastewater characteristics and pollutant sources; (2) the pollutants driving the toxic-weighted pollutant discharges; (3) availability of pollution prevention and treatment; (4) the geographic distribution of facilities in the industry; (5) any pollutant discharge trends within the industry; and (6) any relevant economic factors. First, EPA attempts to verify the screening-level results and to fill in data gaps (Factor 1). Next, EPA considers costs and performance of applicable and demonstrated technologies, process changes, or pollution prevention alternatives that can effectively reduce the pollutants remaining in the point source category's wastewater (Factor 2). Last, EPA considers

[3] Different pollutants may dominate the TRI and PCS TWPE estimates for an industrial category due to the differences in pollutant reporting requirements between the TRI and PCS databases. The single TWPE number for each category highlights those industries with the most toxic discharge data in both TRI and PCS. Although this approach could have theoretically led to double-counting, EPA's review of the data indicates that because the two databases focus on different pollutants, double-counting was minimal and did not affect the ranking of the top ranked industrial categories.

the affordability or economic achievability of the technology, process change, or pollution prevention measures identified using the second factor (Factor 3).

Types of data sources that EPA may consult in conducting its detailed studies include, but are not limited to: (1) U.S. Economic Census; (2) TRI and PCS data; (3) trade associations and reporting facilities to verify reported releases and facility categorization; (4) regulatory authorities (states and EPA regions) to understand how category facilities are permitted; (5) NPDES permits and their supporting fact sheets; (6) EPA effluent guidelines technical development documents; (7) relevant EPA preliminary data summaries or study reports; and (8) technical literature on pollutant sources and control technologies.

Preliminary reviews are similar to detailed studies and have the same purpose. During preliminary reviews, EPA generally examines the same factors and data sources listed above for detailed studies. However, in a preliminary review, EPA's examination of a point source category and available pollution prevention and treatment options is less rigorous than in its detailed studies. While EPA collects and analyzes hazard and technology performance and cost information on categories undergoing preliminary review, it assigns a higher priority to investigating categories undergoing detailed studies.

3.3 Identification of New Categories of Direct Dischargers for Possible Effluent Guidelines Development

Concurrent with its review of existing point source categories, EPA also reviews industries not currently subject to effluent guidelines to identify potential new point source categories. To identify possible new categories, EPA conducts a "crosswalk" analysis based on data in PCS and TRI. Facilities with data in PCS and TRI are identified by a four-digit SIC code (Section 4.1.1 provides more details on SIC codes). As with existing sources, EPA links each four-digit SIC code to an appropriate industrial category (i.e., "the crosswalk").[4] This crosswalk identifies SIC codes that EPA associated with industries subject to an existing guideline. The crosswalk also identifies SIC codes not associated with an existing guideline. In addition to the crosswalk analysis, EPA relies on stakeholder comments and data in identifying potential new point sources categories. TRI and PCS have only limited data on discharges on potential new categories or subcategories. Section 4.1 discusses the utility and limitations of TRI and PCS in detail.

For each industry identified through the crosswalk analysis or stakeholder comments, EPA evaluates whether it constitutes a potential new *category* subject to identification in the plan or whether it is properly considered a potential new *subcategory* of an existing point source category. To make this determination, EPA generally looks at whether the industry produces a similar product or performs a similar service as an existing category. If so, EPA generally considers the industry to be a potential new subcategory of that category. If, however, the industry is significantly different from existing categories in terms of products or services provided, EPA considers the industry as a potential new stand-alone category subject to identification in the plan.

[4] For additional information on "the crosswalk," see Section 5.0 of the *2005 Annual Screening-Level Analysis Report* (U.S. EPA, 2005).

Because the CWA specifies different requirements for potential new categories of direct and indirect dischargers, EPA examines potential new categories to determine if the category comprises mostly indirect dischargers or if it comprises both direct and indirect dischargers. If a category consists largely of indirect dischargers, EPA evaluates the pass-through and interference potential of the category (see Section 3.4). If a category includes direct dischargers, EPA evaluates the type of pollutants discharged by the category.

EPA does not identify in the plan industries for which conventional pollutants, rather than toxic or nonconventional pollutants, are the pollutants of concern. Also, even where toxic and non-conventional pollutants are present in the discharge, EPA does not identify the industry in the plan if such pollutants are present only in trivial amounts and thereby present an insignificant hazard to human health and the environment.

Further, EPA would likely not identify an industrial sector as a candidate point source category for an effluent guidelines rulemaking when: (1) the industrial category is currently the subject of an effluent guidelines rulemaking effort (e.g., Airport Deicing Operations, Drinking Water Treatment Facilities); or (2) direct discharges from point sources within the industrial sector are not subject to the CWA permitting requirements (e.g., direct discharges from silviculture operations).

Finally, EPA does not necessarily identify in the plan all potential new categories subject to identification. Rather, EPA may exercise its discretion to identify only those potential new categories for which it believes an ELG would be an appropriate tool — and rely on other CWA tools (e.g., water quality-based effluent limitations or assistance to permit writers in establishing site-specific technology-based effluent limitations) when such other mechanisms would be more effective and efficient.

3.4 Identification of New Categories of Indirect Dischargers for Possible Effluent Guidelines Development

For potential new categories with primarily indirect discharges, EPA evaluates the potential for the wastewater to "interfere with, pass through, or [be] otherwise incompatible with" the operation of POTWs. See 33 U.S.C. § 1371(b)(1). Using available data, EPA reviews the types of pollutants in an industry's wastewater. Then, EPA reviews the likelihood of those pollutants to pass through a POTW. For most categories, EPA evaluated the "pass through potential" as measured by: (1) the total annual TWPE discharged by the industrial sector; and (2) the average TWPE discharge among facilities that discharge to POTWs. EPA also assesses the interference potential of the discharge. Finally, EPA considers whether the pollutant discharges are already adequately controlled by general pretreatment standards and/or local pretreatment limits. In particular, EPA reviewed the pollutant discharges and potential technology options for dental amalgam and unused pharmaceutical management in the Health Services Industry, which is composed of nearly all indirect dischargers (see Section 12.2).

3.5 Stakeholder Involvement and Schedule

EPA's goal is to involve stakeholders early and often during its annual reviews of existing effluent guidelines and the development of the biennial plans. This will likely maximize collection of data to inform EPA's analyses and provide additional transparency and understanding of EPA's effluent guidelines priorities identified in the biennial plans.

EPA's annual reviews build on reviews from previous years, and reflect a lengthy outreach effort to involve stakeholders in the review process. In performing its annual reviews, EPA considers all public comments, information, and data submitted to EPA as part of its outreach activities. EPA solicits public comment at the beginning of each annual review of effluent guidelines and on the preliminary biennial plan. In each Federal Register Notice, EPA requests stakeholder comments on specific industries and discharges as well as any general comments.

EPA completes an annual review of industrial discharges each year, upon publication of the Preliminary and Final Effluent Guidelines Program Plans. In odd-numbered years, EPA publishes its preliminary plan that EPA must publish for public review and comment under CWA section 304(m)(2). In even-numbered years, EPA publishes its final plan that incorporates the comments received on the preliminary plan.

EPA intends that these coincident reviews will provide meaningful insight into EPA's effluent guidelines and pretreatment standards program decision-making. Additionally, EPA is using an annual publication schedule to most efficiently serve the public as these annual notices will serve as the "one-stop shop" source of information on the Agency's current and future effluent guidelines and pretreatment standards program.

3.6 The Effluent Guidelines Planning Process References

1. ERG. 2007. Quality Assurance Project Plan for 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data. (March 19). EPA-HQ-OW-2006-0771-0208.

2. U.S. EPA. 2005. 2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of New Point Source Categories for Effluent Limitations and Standards. EPA-821-B-05-003. Washington, DC. (August). EPA-HQ-OW-2004-0032-0901.

3. U.S. EPA. 2006. Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process. Washington, DC. (June). EPA-HQ-OW-2004-0032-1634.

4.0 METHODOLOGY, DATA SOURCES, AND LIMITATIONS

As discussed in Section 1.0, the CWA requires EPA to conduct an annual review of existing effluent limitations guidelines and standards (ELGs). It also requires EPA to identify unregulated industrial categories. EPA's methodology for this annual review and unregulated category identification involves several components, as discussed in Section 3.0.

First, EPA performs a screening-level review of all point source categories subject to existing ELGs to identify categories discharging high levels of toxic and nonconventional pollutants relative to other categories. Using the results of the screening-level review, EPA continues its annual review of priority categories to identify candidate ELGs for revision, as required by CWA sections 304(b), 301(d), 304(g), and 307(b). The findings of EPA's 2008 annual review are discussed in Part II (Sections 5.0 to 11.0). Second, EPA reviews indirect discharging industries not currently subject to pretreatment standards to identify potential candidates for pretreatment standards development, as required by CWA section 307(b). Finally, EPA reviews direct discharging industries not currently subject to ELGs to identify potential candidates for ELG development, as required by section 304(m)(1)(B) of the CWA. EPA did not identify for rulemaking any indirect or direct discharging industries not currently subject to pretreatment standards or ELGs in the 2008 annual review.

In performing the screening-level reviews of existing ELGs and identifying unregulated industrial categories, EPA relies on data from the Permit Compliance System (PCS) and Toxics Release Inventory (TRI). This section discusses these databases, related data sources, and their limitations.

EPA has developed two screening-level tools, the *TRIReleases* and *PCSLoads* databases, to facilitate analysis of TRI and PCS. EPA previously explained the creation of these screening-level analysis tools in the *2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of Potential New Categories for Effluent Limitations Guidelines and Standards* (2005 SLA Report), dated August 2005 (U.S. EPA, 2005b). Additionally, the *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan* (2008 Preliminary Plan TSD), dated October 2007 (U.S. EPA, 2007), describes updated methodology for the development of the *TRIReleases* and *PCSLoads* databases. The 2005 SLA Report and 2008 Preliminary Plan TSD provide the detailed methodology used to process thousands of data records and generate national estimates of industrial effluent discharges. This section does not revisit the details of creating the database tools. Instead, it lists the methodology corrections made to the PCS and TRI databases after EPA's 2007 annual review. It also presents the preliminary category rankings from *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2004_v4*.

4.1 <u>Data Sources and Limitations</u>

This subsection provides general information on the use of SIC codes, TWFs, TRI data, and PCS data. The following reports supplement this section and discuss EPA's methodology for developing and using these tools:

- *2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of New Point Source Categories for Effluent Limitations and Standards* (2005 SLA Report), dated August 2005 (U.S. EPA, 2005b). Documents the methodology and development of the *PCSLoads2002* and *TRIReleases2002* databases, including (but not limited to) matching SIC codes to point source categories and using TWFs to estimate TWPE.
- *Technical Support Document for the 2006 Effluent Guidelines Program Plan* (2006 TSD), dated December 2006 (U.S. EPA, 2006b). Explains and documents methodology corrections made to the TRI and PCS databases after EPA's 2005 and 2006 annual reviews.
- *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan* (2008 Preliminary Plan TSD), dated October 2007 (U.S. EPA, 2007). Explains and documents methodology corrections made to the TRI and PCS databases for EPA's 2007 annual review.
- *Draft Toxic Weighting Factor Development in Support of the CWA 304(m) Planning Process* (Draft TWF Development Document), dated July 2005 (U.S. EPA, 2005a). Explains how EPA developed its TWFs.
- *Toxic Weighting Factor Development in Support of the CWA 304(m) Planning Process* (Final TWF Development Document) (U.S. EPA, 2006a). Explains how EPA developed the April 2006 TWFs.

4.1.1 SIC Codes

The SIC system was developed to help with the collection, aggregation, presentation, and analysis of data from the U.S. economy (OMB, 1987). The SIC code is formatted in the following way:

- The first two digits represent the major industry group;
- The third digit represents the industry group; and
- The fourth digit represents the industry.

For example, major SIC code 10: Metal Mining, includes all metal mining operations. Within SIC code 10, four-digit SIC codes are used to separate mines by metal type: 1011 for iron ore mining, 1021 for copper ore mining, etc.

The SIC system is used by many government agencies, including EPA, to promote data comparability. In the SIC system, each establishment is classified according to its primary economic activity, which is determined by its principal product or group of products. An establishment may have activities in more than one SIC code. Some data collection organizations (e.g., the economic census) track only the primary SIC code for each establishment. TRI allows reporting facilities to identify their primary SIC code and up to five additional SIC codes. PCS includes one four-digit SIC code, reflecting the principal activity causing the discharge at each facility. For a given facility, the SIC code in PCS may differ from the primary SIC code identified in TRI.

Regulations for an individual point source category may apply to one SIC code, multiple SIC codes, or a portion of the facilities in an SIC code. Therefore, to use databases that identify facilities by SIC code, EPA linked each four-digit SIC code to an appropriate point source category, as summarized in the “SIC/Point Source Category Crosswalk” table (Table A-1 in Appendix A).

There are some SIC codes for which EPA has not established national ELGs. Some of these SIC codes were reviewed because they were identified through stakeholder comments or other factors. Table A-2 in Appendix A lists the SIC codes for which facility discharge data are available in TRI and/or PCS, but for which EPA could not identify an applicable point source category. For a more detailed discussion, see Section 5.5 of the 2005 SLA Report (U.S. EPA, 2005b).

4.1.2 Toxic Weighting Factors

In developing ELGs, EPA developed a variety of tools and methodologies to evaluate effluent discharges. Within EPA’s Office of Water, the Engineering and Analysis Division (EAD) maintains a Toxics Database, compiled from over 100 references, that contain aquatic life and human health toxicity data, as well as physical/chemical property data, for more than 1,900 pollutants. The pollutants in this database are identified by a unique Chemical Abstracts Service (CAS) number. EPA calculates TWFs from these data to account for differences in toxicity across pollutants and to provide the means to compare mass loadings of different pollutants on the basis of their toxic potential. In its analyses, EPA multiplies a mass loading of a pollutant in pounds per year (lb/yr) by a pollutant-specific weighting factor to derive a “toxic-equivalent” loading (lb-equivalent/yr). The development of TWFs is discussed in detail in the Draft and Final TWF Development Documents (U.S. EPA, 2005a; U.S. EPA, 2006a).

EPA derives TWFs from chronic aquatic life criteria (or toxic effect levels) and human health criteria (or toxic effect levels) established for the consumption of fish. In the establishment of 304(a) water quality criteria for carcinogenic substances, EPA's goal is to set the human health risk level at 10^{-6} (i.e., protective to a level allowing 1 in 1,000,000 excess lifetime cancer cases over background). In the TWF method for assessing water-based effects, these toxicity levels are compared to benchmark values. EPA selected copper, a toxic metal commonly detected and removed from industry effluent, as the benchmark pollutant. The Final TWF Development Document contains details on how EPA developed its TWFs (U.S. EPA, 2006a). Table A-3 in Appendix A lists the TWFs for those chemicals in the *TRIReleases* and *PCSLoads* databases for which EPA has developed TWFs.

4.1.2.1 New Toxic Weighting Factors Developed During the 2007 Annual Review

During the 2007 annual review, EPA revised the TWF for one chemical (reflecting updated information on the underlying data) and developed new TWFs for chemicals that had not previously had TWFs. Table 4-1 lists the newly developed TWFs. The only pollutants with new TWFs in EPA’s databases (*TRIReleases* and *PCSLoads*) are picloram acid (TGAI) and potassium picloram (K-salt). However, only one facility reports picloram acid (TGAI) and potassium picloram (K-salt) in *TRIReleases2005*, while these pollutants are not in the *PCSLoads2004* database.

Table 4-1. Newly Developed TWFs in 2007

Pollutant	CAS Number	TWF
Picloram triisopropanolamine salt (TIPA)	6753475	0.00285
Nonylphenol	25154-52-3	0.848
Octylphenol	27193-28-8	0.295
Alky phenol ethoxylates	68987-90-6	2.80
Picloram acid (TGAI)	1918-02-01	0.0103
Potassium picloram (K-salt)	2545-60-0	0.00436

Source: Toxic Weighting Factors Developed for the Proposed 2008 Effluent Guidelines Plan (ERG, 2007b).

4.1.3 Calculation of TWPE

EPA weighted the annual pollutant discharges calculated from the TRI (see Section 4.1.4) and PCS (see Section 4.1.5) databases using EAD's TWFs to calculate TWPE for each reported discharge. EPA summed the estimated TWPE discharged by each facility in a point source category to understand the potential hazard of the discharges from each category. The following subsections discuss the calculation of TWPE.

4.1.4 Data from TRI

TRI is the common name for Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA). Each year, facilities that meet certain thresholds must report their releases and other waste management activities for listed toxic chemicals. Facilities must report the quantities of toxic chemicals recycled, collected and combusted for energy recovery, treated for destruction, or disposed of. A separate report must be filed for each chemical that exceeds the reporting threshold. The TRI list of chemicals for reporting years 2004 and 2005 includes more than 600 chemicals and chemical categories. For the 2007 and 2008 screening-level reviews, EPA used data for reporting years 2004 and 2005, because they were the most recent available at the time the review began.

A facility must meet the following three criteria to be required to submit a TRI report for a given reporting year:

1. *SIC Code Determination.* Facilities in SIC codes 20 through 39, facilities in 16 additional SIC codes outside that range,[5] and federal facilities are subject to TRI reporting. EPA generally relies on facility claims regarding the SIC code identification. The primary SIC code determines TRI reporting.
2. *Number of Employees.* Facilities must have 10 or more full-time employees or their equivalent. EPA defines a "full-time equivalent" as a person that works 2,000 hours in the reporting year (there are several exceptions and special circumstances that are well-defined in the TRI reporting instructions).
3. *Activity Thresholds.* If the facility is in a covered SIC code and has 10 or more full-time employee equivalents, it must conduct an activity threshold analysis for

[5] The 16 additional SIC codes are 1021, 1031, 1041, 1044, 1061, 1099, 1221, 1222, 1231, 4911, 4931, 4939, 4953, 5169, 5171, and 7389.

every chemical and chemical category on the current TRI list. The facility must determine whether it manufactures, processes, *or* otherwise uses each chemical at or above the appropriate activity threshold. Reporting thresholds are *not* based on the amount of release. All TRI thresholds are based on mass, not concentration. Different thresholds apply for persistent bioaccumulative toxic (PBT) chemicals than for non-PBT chemicals. Generally, threshold quantities are 25,000 pounds for manufacturing and processing activities and 10,000 pounds for other use activities. All thresholds are determined per chemical over the calendar year. For example, dioxin and dioxin-like compounds are considered PBT chemicals. The TRI reporting guidance requires any facility that manufactures, processes, or otherwise uses 0.1 grams of dioxin and dioxin-like compounds to report it to TRI (U.S. EPA, 2000).

In TRI, facilities report annual loads released to the environment of each toxic chemical or chemical category that meets reporting requirements. They must report onsite releases or disposal to air, receiving streams, land, underground wells, and several other categories. They must also report the amount of toxic chemicals in wastes transferred to offsite locations, (e.g., POTWs, commercial waste disposal facilities).

For its screening-level reviews, EPA focused on the amount of chemicals facilities reported either discharging directly to a receiving stream or transferring to a POTW. For facilities discharging directly to a stream, EPA took the annual loads directly from the reported TRI data for calendar years 2004 and 2005. For facilities transferring to POTWs, EPA first adjusted the TRI pollutant loads reported to be transferred to POTWs to account for pollutant removal that occurs at the POTWs prior to discharge to the receiving stream. Table A-4 in Appendix A lists the POTW removals used for all TRI chemicals reported as transferred to POTWs.

Facilities reporting to TRI are not required to sample and analyze waste streams to determine the quantities of toxic chemicals released. They may estimate releases based on mass balance calculations, published emission factors, site-specific emission factors, or other approaches. Facilities are required to indicate, by a reporting code, the basis of their release estimate. TRI’s reporting guidance is that, for most chemicals reasonably expected to be present but measured below the detection limit, facilities should use half the detection limit to estimate the mass released. However, for dioxins and dioxin-like compounds, non-detects should be treated as zero.

TRI allows facilities to report releases as specific numbers or as ranges, if appropriate. Specific estimates are encouraged if data are available to ensure the accuracy; however, EPA allows facilities to report releases in the following ranges: 1 to 10 pounds, 11 to 499 pounds, and 500 to 999 pounds. For its screening-level reviews, EPA used the midpoint of each reported range to represent a facility’s releases, as applicable.

4.1.4.1 Utility of TRI Data

The data collected in TRI are particularly useful for ELG planning for the following reasons:

- TRI is national in scope, including data from all 50 states and U.S. territories;
- TRI includes releases to POTWs, not just direct discharges to surface water;
- TRI includes discharge data from manufacturing SIC codes and some other industrial categories; and
- TRI includes releases of many toxic chemicals, not just those in facility discharge permits.

4.1.4.2 Limitations of TRI

For purposes of ELG planning, limitations of the data collected in TRI include the following:

- Small establishments (less than 10 employees) are not required to report, nor are facilities that don't meet the reporting thresholds. Thus, facilities reporting to TRI may be a subset of an industry.
- Release reports are, in part, based on estimates, not measurements, and, due to TRI guidance, may overstate releases, especially at facilities with large wastewater flows.
- Certain chemicals (polycyclic aromatic compounds [PACs], dioxin and dioxin-like compounds, metal compounds) are reported as a class, not as individual compounds. Because the individual compounds in most classes have widely varying toxic effects, the potential toxicity of chemical releases can be inaccurately estimated.
- Facilities are identified by SIC code, not point source category. For some SIC codes, it may be difficult or impossible to identify the point source category that is the source of the toxic wastewater releases.

Despite these limitations, EPA determined that the data summarized in *TRIReleases2004* and *TRIReleases2005* were usable for the 2007 and 2008 screening-level reviews and prioritization of the toxic-weighted pollutant loadings discharged by industrial categories. The TRI database remains the only data source for national estimates of industrial wastewater discharges of unregulated pollutants.

4.1.5 Data from PCS

PCS is a computerized information management system maintained by EPA's Office of Enforcement and Compliance Assurance (OECA). It was created to track permit, compliance, and enforcement status of facilities regulated by the NPDES program under the CWA. Among other things, PCS houses discharge data for these facilities.

More than 65,000 industrial facilities and wastewater treatment plants have permits for wastewater discharges to waters of the United States. To provide an initial framework for setting permitting priorities, EPA developed a major/minor classification system for industrial and municipal wastewater discharges. Major discharges almost always have the capability to impact receiving waters if not controlled and, therefore, have received more regulatory attention than minor discharges. There are approximately 6,400 facilities (including sewerage systems) with major discharges for which PCS has extensive records. Permitting authorities classify discharges as major based on an assessment of six characteristics:

4. Toxic pollutant potential;
5. Discharge flow: stream flow ratio;
6. Conventional pollutant loading;
7. Public health impact;
8. Water quality factors; and
9. Proximity to coastal waters.

Facilities with major discharges must report compliance with NPDES permit limits via monthly Discharge Monitoring Reports (DMRs) submitted to the permitting authority. The permitting authority enters the reported DMR data into PCS, including pollutant concentration and quantity values and identification of any types of permit violations.

Minor discharges may, or may not, adversely impact receiving water if not controlled. Therefore, EPA does not require DMRs for facilities with minor discharges. For this reason, the PCS database includes data only for a limited set of minor dischargers when the states choose to include these data.

Parameters in PCS include water quality parameters (such as pH and temperature), specific chemicals, conventional parameters (such as BOD_5 and total suspended solids [TSS]), and flow rates. Although other pollutants may be discharged, PCS contains only data for the parameters identified in the facility's NPDES permit. Facilities typically report monthly average pounds per day discharged, but also report daily maxima and average pollutant concentrations.

For the 2007 annual review, EPA used data for reporting year 2004, to correspond to the data obtained from TRI. For the 2008 annual review, EPA corrected certain aspects of the 2004 data in response to comments (see Section 4.2). EPA did not use data for reporting year 2005 because, based on comparisons of 2000, 2001, and 2002 PCS data for certain industrial categories, 2005 discharges were not likely to change significantly from 2004, and also because the creation of the *PCSLoads* database is labor-intensive. EPA used a mainframe computer program, called the Effluent Data Statistics (EDS) System, to calculate annual loads using PCS data for 2000 and 2002 discharges. For the 2007 annual review, however, EPA used the *PCSLoadCalculator* instead of EDS to calculate annual loads using PCS data for 2004 discharges. EPA used the *PCSLoadCalculator* because it allows EPA more flexibility and control over the annual load calculations and provides more transparent documentation of the calculation routine. Section 6.0 of the 2008 Preliminary Plan TSD provides details on the methodology and development of *PCSLoads2004* (U.S. EPA, 2007).

4.1.5.1 Utility of PCS

The data collected in PCS are particularly useful for the ELG planning process for the following reasons:

- PCS is national in scope, including data from all 50 states and U.S. territories.
- Discharge reports included in PCS are based on effluent chemical analysis and metered flows.
- PCS includes facilities in all SIC codes.

- PCS includes data on conventional pollutants for most facilities and for the nutrients nitrogen and phosphorus for many facilities. However, EPA did not use the nutrient data because of data quality concerns.

4.1.5.2 Limitations of PCS

Limitations of the data collected in PCS include the following:

- PCS contains data only for pollutants a facility is required by permit to monitor; the facility is not required to monitor or report all pollutants actually discharged.
- Some states do not submit all DMR data to PCS, or do not submit the data in a timely fashion.
- PCS includes very limited discharge monitoring data from minor dischargers.
- PCS does not include data characterizing indirect discharges from industrial facilities to POTWs.
- Some of the pollutant parameters included in PCS are reported as a group parameter and not as individual compounds (e.g., "Total Kjeldahl Nitrogen," "oil and grease"). Because the individual compounds in the group parameter may have widely varying toxic effects, the potential toxicity of chemical releases can be inaccurately estimated.
- In some cases, the PCS database identifies the type of wastewater (e.g., process wastewater, stormwater, noncontact cooling water) being discharged; however, most do not and, therefore, total flow rates reported to PCS may include stormwater and noncontact cooling water, as well as process wastewater.
- Pipe identification is not always clear. For some facilities, internal monitoring points are labeled as outfalls, and PCS may double-count a facility's discharge. In other cases, an outfall may be labeled as an internal monitoring point, and PCS may not account for all of a facility's discharge.
- Facilities provide SIC code information for only the primary operations, even though data may represent other operations as well. In addition, some facilities do not provide information on applicable SIC codes.
- Facilities are identified by SIC code, not point source category. For some SIC codes, it may be difficult or impossible to identify the point source category that is the source of the reported wastewater discharges.
- PCS was designed as a permit compliance tracking system and does not contain production information.
- PCS data may be entered into the database manually, which leads to data-entry errors.
- In PCS, data may be reported as an average quantity, maximum quantity, average concentration, maximum concentration, and/or minimum concentration. For many facilities and/or pollutants, average quantity values are not provided. In these cases, EPA is limited to estimating facility loads based on the maximum quantity. Section 4.4.2 discusses the maximum quantity issue in detail.

Despite these limitations, EPA determined that the data summarized in *PCSLoads2004* were usable for the 2007 and 2008 screening-level reviews and prioritizations of the toxic-weighted pollutant loadings discharged by industrial facilities. The PCS database remains the only data source quantifying the pounds of regulated pollutants discharged directly to surface waters of the United States.

4.2 Methodology Corrections Affecting Both Screening-Level Review Databases

EPA did not make any methodological changes to the screening-level review databases, *TRIReleases2004*, *PCSLoads2004*, and *TRIReleases2005*, as part of the 2008 annual review.

4.3 Corrections to the *TRIReleases2004* Database

EPA did not make any corrections to the *TRIReleases2004_v3* database as part of the 2008 annual review.

4.4 Corrections to the *PCSLoads2004* Database

For the 2008 annual review, EPA updated the *PCSLoads2004* database. The 2008 Preliminary Plan TSD provides details on the methodology for developing the *PCSLoads2004* database (U.S. EPA, 2007). This section describes the changes made to the *PCSLoads2004* database after publication of the 2007 Preliminary Plan.

EPA identified only one correction to the database during the 2008 annual review. The discharges of hexachlorobenzene were incorrectly classified as BHC, another pollutant, and linked to the TWF for BHC. The *PCSLoads2004_v3* database corrects this error.

4.5 Corrections to the *TRIReleases2005* Database

EPA developed the *TRIReleases2005* database as part of the 2008 annual review using the methodology explained in the 2005 SLA Report and 2008 Preliminary Plan TSD (U.S. EPA, 2005b; U.S. EPA, 2007).

During previous screening-level analyses, EPA identified numerous facility-specific corrections for TRI data reported for calendar years 2002, 2003, and 2004. Several of these corrections similarly apply to the 2005 TRI data. In addition, EPA reviewed the quality of the 2005 TRI data and discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. Table B-1 in Appendix B of this report lists all corrections made to the 2005 TRI data.

4.5.1 TRIReleases2005: Categorization of Discharges

This section describes database corrections to categorization of facilities and pollutant discharges in *TRIReleases2005*. Section 5 of the 2005 SLA Report describes the development of the SIC/Point Source Category Crosswalk, which EPA uses to link between facility SIC codes and categories with existing ELGs (U.S. EPA, 2005). Because most point source categories are not defined by SIC code, the relationship between SIC code and point source category is not a one-to-one correlation. A single SIC code may include facilities in more than one point source category, so associating an SIC code with only one category may be an over simplification. Also, many facilities have operations subject to more than one point source category. Further, facilities in some categories cannot be identified by SIC code (e.g., Centralized Waste Treatment facilities). The database changes, summarized below, are described in detail in Section 5 of the 2005 SLA Report (U.S. EPA, 2005b):

- *Facility-Level Point Source Category Assignment.* For some SIC codes that include facilities subject to guidelines from more than one point source category, EPA was able to assign each facility to the category that best applied to the majority of its discharges. EPA reviewed information available about each facility to determine which point source category applied to the facility's operations. EPA assigned the following SIC codes to point source categories at the facility level:
  - SIC 2048 (Prepared Feed and Feed Ingredients for Animals and Fowl, Except Dogs and Cats). Facility discharges are assigned to either the Grain Mills Manufacturing, Meat and Poultry Products, or Pharmaceutical Manufacturing point source categories.
  - SIC 2819 (Industrial Inorganic Chemicals, NEC). Facility discharges are assigned to either the Inorganic Chemicals Manufacturing, Nonferrous Metals Manufacturing, or Phosphate Manufacturing point source categories.
  - SIC 2874 (Phosphatic Fertilizers). Facility discharges are assigned to either the Phosphate Manufacturing or Fertilizer Manufacturing point source categories.
  - SIC code changes for specific industries. Facility discharges are assigned to the following point source categories:
    - Pulp, Paper, and Paperboard Point Source Category phases (see the 2005 SLA Report [U.S. EPA, 2005b]);
    - Chlorine or chlorinate hydrocarbon (CCH) manufacturing facilities in the Organic Chemicals, Plastics, and Synthetic Fibers or Inorganic Chemicals Manufacturing Point Source Categories (see the 2005 SLA Report [U.S. EPA, 2005b]); and
    - Porcelain Enameling Point Source Category (see the 2006 TSD [U.S. EPA, 2006b]).

- *Pollutant-Level Point Source Category Assignment.* Many facilities have operations subject to more than one point source category. For most of these facilities, EPA cannot divide the pollutant discharges among the applicable point source categories. Two exceptions where EPA was able to assign wastewater discharges of certain chemicals to the appropriate point source category include Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF)/Pesticides and MP&M/Metal Finishing:
  - OCPSF/Pesticides. EPA removed all pesticide discharges from OCPSF and counted them as discharges from the Pesticides Chemicals Point Source Category.
  - MP&M/Metal Finishing. EPA used the methodologies described in Section 5 of the SLA Report to apportion pollutant loads between the MP&M and Metal Finishing Point Source Categories.

- *Categories Not Identified by SIC Code (e.g., Centralized Waste Treatment, Waste Combustor, and Landfills).* The SIC/Point Source Category Crosswalk does not assign any SIC codes to the Centralized Waste Treatment (CWT) Point Source

Category (40 CFR Part 437), Waste Combustor Point Source Category (30 CFR Part 444), or Landfills Category (40 CFR Part 445). Furthermore, the applicability of these three regulations is not defined by SIC codes and no SIC code properly describes the CWT, waste combustor, or landfill services. However, some facilities in these categories report under SIC 4953: Refuse Systems. EPA identified specific facilities as CWTs during previous category reviews and assigned these CWT facilities a placeholder SIC code of "CWT," putting them in the CWT Point Source Category. EPA also identified specific facilities as waste combustors during previous category reviews and assigned these waste combustor facilities a placeholder SIC code of "WC," putting them in the Waste Combustor Point Source Category. The remaining facilities were categories as the Landfills Point Source Category. In addition, for the *TRIReleases2005* database, EPA categorized the facilities reporting SIC code 4953 into the CWT, Landfills, or Waste Combustors Point Source Categories based on the specific operations at the facility.

4.5.2 TRIReleases2005: Pollutant Corrections

This section describes database corrections made to discharges of specific pollutants reported to the TRI for EPA's 2008 screening-level review in the *TRIReleases2005* database.

- *Metal Compounds.* For TRI reporting, facilities may be required to report discharges of a metal (e.g., zinc) and its compounds (e.g., zinc compounds) on a single reporting form. Because the release quantity for the metal compound reporting is based on the mass of the parent metal, EPA uses the parent metal TWF to calculate TWPE for the metal and metal compound discharges. For ranking purposes, EPA combined the TWPEs for the metal and metal compounds (i.e., TWPE reported for "zinc and zinc compounds"). For more details on this correction, see Section 3.4.4 of the 2005 SLA Report (U.S. EPA, 2005b).
- *Sodium Nitrite.* For TRI reporting, sodium nitrite release quantities are reported as the mass of the sodium nitrite. Sodium nitrite is an ionic salt that will fully dissociate into nitrite and sodium ions in aqueous solutions. In addition, the nitrite ions are unstable in water and will oxidize to nitrate. Therefore, EPA converted the pounds of TRI-reported sodium nitrite discharges to pounds of nitrogen in the discharge and used the TWF for "nitrate as N" (0.0032) to calculate TWPE for sodium nitrite. In addition, EPA also used the POTW removal for nitrate to account for the removal of sodium nitrite in POTWs.
- *Phosphorus (Yellow or White).* Yellow and white phosphorus, both allotropes of elemental phosphorus, are hazardous chemicals that spontaneously ignite in air. During the 2006 screening-level review, EPA determined that facilities were incorrectly reporting discharges of total phosphorus (i.e., the phosphorus portion of phosphorus-containing compounds) as phosphorus (yellow or white). Therefore, EPA deleted all phosphorus (yellow or white) discharges reported to TRI for the 2008 screening-level review.

4.5.3 TRIReleases2005: Data Quality Review

EPA evaluated the quality of TRI data for use in the 2008 screening-level review and prioritization of loadings of toxic and non-conventional pollutants discharged by industrial categories based on completeness, accuracy, reasonableness, and comparability. The *Quality Assurance Project Plan for the 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data* describes the quality objectives in more detail (ERG, 2007a). The following discussion provides an overview of the quality review steps:

- *Completeness Checks.* EPA compared counts of facilities in *TRIReleases2005* to *TRIReleases2004*, *TRIReleases2003*, and *TRIReleases2002* to describe the completeness of the database. The comparison showed that for 74 percent of the SIC codes, the number of facilities reporting wastewater discharges changed by less than 25 percent from 2004 to 2005. EPA also determined that most SIC codes exhibiting a large percentage change did so because only a few facilities in these SIC codes reported discharges (e.g., a change from one facility to three facilities is equivalent to a 200 percent increase).
- *Accuracy of Facility Discharges.* EPA identified facilities with the highest TWPE loadings. EPA identified facilities for review whose pollutant discharges accounted for more than 95 percent of the TWPE for their point source category. EPA compared 2005 TRI data to other available information, such as PCS, information from EPA's Envirofacts Web page, the facilities' NPDES permits, and discussion with facility contacts.
- *Accuracy of Category Discharges.* EPA reviewed the accuracy of category discharges by verifying that pollutant discharges in TRI were assigned to the appropriate point source category. EPA used engineering judgment to determine if pollutant discharges were reasonably associated with the point source category.
- *Accuracy of Database Queries.* EPA's quality review for the development of *TRIReleases2005* included accuracy checks for database queries in *TRICalculations2005* and *TRIReleases2005*. Documentation of accuracy checks is provided in a QC table in each Microsoft Access database.
- *Comparability.* EPA compared *TRIReleases2005* to *TRIReleases2004*, *TRIReleases2003*, and *TRIReleases2002* to identify pollutant discharges that differ more than the year-to-year variation of other chemicals and facilities. From the comparison, EPA determined that 59 percent of the pollutants discharged in both 2005 and 2004 had a change of less than 50 percent in the quantity discharged. EPA also determined that most of the large percentage change reflected initial discharges of small quantities. In addition, most of these pollutant discharges resulted in small TWPEs.

4.5.4 *TRIReleases2005: Facility Reviews*

Table 4-2 presents EPA's TRI facility review and corrections made to the *TRIReleases2005* database. EPA reviewed the accuracy of calculated discharges from facilities with discharges that have the greatest impact on total category loads and category rankings. EPA used the following criteria to select facilities for review:

- Facilities with the highest toxic-weighted discharges of all facilities reporting to TRI for reporting year 2005;
- Facilities with the highest toxic-weighted discharges of individual chemicals that contribute the majority of the toxic-weighted discharges for all categories; and
- Facilities with the highest toxic-weighted discharges from categories that contribute the majority of the toxic-weighted discharges for all categories.

For the identified facilities, EPA used the following steps to review the accuracy of the loads calculated from TRI data.

1. Review database corrections for *TRIReleases2004*, *TRIReleases2003*, *TRIReleases2002*, and *TRIReleases2000* to determine whether corrections were made during previous reviews and evaluate whether these corrections should be applied to *TRIReleases2005*.
2. Review discharges reported to TRI for other reporting years (i.e., 2000, 2002, 2003, and 2004) and compare to discharges reported to TRI for reporting year 2005.
3. Review 2005 discharge monitoring report data in PCS, if available, to hand-calculate annual pollutant loads and compare to discharges reported to TRI for reporting year 2005.
4. Contact the facility to verify whether the pollutant discharges are reported correctly.

4.6 *TRIReleases2004* and *TRIReleases2005* Rankings and *PCSLoads2004* Rankings

After incorporating the changes discussed in Sections 4.3, 4.4, and 4.5, EPA generated the final versions of the TRI and PCS databases used for the 2008 screening-level review: *TRIReleases2004_v3, PCSLoads2004_v4*, and *TRIReleases2005_v2*. Tables C-1, C-2, and C-3 in Appendix C present the category rankings by TWPE from the *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2003_v4* databases, respectively. The category rankings presented in these tables reflect all the corrections made during the 2007 and 2008 screening-level reviews. Tables C-4 through C-6 in Appendix C present the four-digit SIC code rankings by TWPE from the *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2004_v4* databases, respectively. Tables C-7 through C-9 in Appendix C present the chemical rankings by TWPE from the *TRIReleases2004_v3*, *TRIReleases2005_v2*, *PCSLoads2004_v4* databases, respectively.

Table 4-2. Summary of *TRIReleases2005* Facility Review

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
ADM	Decatur, IL	Grain Mills	Chlorine	Facility reported discharging 61,099 TWPE of chlorine. Facility reported that the chlorine discharge in TRI is erroneous, and the facility is currently working to re-submit their Form R for chlorine.	No changes made
Cahaba Pressure Treated Forest Products	Brierfield, AL	Timber	Dioxin	Facility reported a dioxin congener distribution using outdated industry guidance. Based on information collected in 2008.	Changed dioxin distribution to the industry-provided dioxin distribution for SIC code 2491.
Dow Chemical Co Freeport Facility	Freeport, TX	Pesticide Chemicals	Picloram	Facility reported picloram load to be 99% picloram salt and 1% picloram acid. Based on information collected in 2006.	Changed the picloram TWPE from 333,000 to 700, using TWFs for the two forms of picloram.
Du Pont Memphis Plant	Shelby, TN	Inorganic Chemicals	Dioxin And Dioxin-Like Compounds	The facility provided the dioxin and dioxin-like compounds analytical data, which included measurements in a blank sample with greater than or equal values for several congeners. Contacts made during the 2006 category review.	Changed the dioxin and dioxin-like compound load and distribution based on the revised measurement data.

Table 4-2. Summary of *TRIReleases2005* Facility Review

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
DuPont Chambers Works	Deepwater, NJ	Pesticide Chemicals	Hexachloro-benzene	Based on contact regarding 2005 data, over 99% of hexachlorobenzene on site comes from outside contracts associated with the CWT.	Changed the SIC code for the hexachlorobenzene discharge to CWT.
Eastman Kodak Co Kodak Park	Rochester, NY	Metal Finishing	Dioxin And Dioxin-Like Compounds	The facility calculates the dioxin and dioxin-like compound discharge based on the measured concentration in the effluent from the treatment plant and the total plant flow rate. In 2005, the facility detected only one congener (octachlorodibenzo-p-dioxin) three times in their wastewater effluent. Based on contact made in 2008.	Changed the dioxin distribution to reflect detection of octachlorodibenzo-p-dioxin only.
ExxonMobil Chemical Baton Rouge Chemical Plant	Baton Rouge, LA	OCPSF	Polycyclic Aromatic Compounds	Facility used 1/2 the detection limit for PACs in their 2000 TRI estimate. ERG contacted the facility about the TRI 2004 PACs discharge. Facility stated that it measured for all PACs every month and all were less than detection limit.	Changed the PACs load to zero.
International Paper Co Camden Complex	Camden, TX	Timber	Dioxin and Dioxin-Like Compounds	Facility reported an erroneous dioxin congener distribution originating from a spreadsheet error. Based on information collected in 2008.	Changed dioxin distribution based on a facility-guided revision of the dioxin calculations.
Tronox Pigments Inc (Formerly Kerr-McGee)	Savannah, GA	Inorganic Chemicals	Dioxin And Dioxin-Like Compounds	The facility provided data that shows all concentrations of dioxins and furan congeners in the water were below detection limit. Based on communications with facility for 2006 review.	Changed dioxin and dioxin-like compounds load to zero.

Table 4-2. Summary of *TRIReleases2005* Facility Review

Facility Name	Facility Location	Point Source Category	Chemical(s) in Question	Review Findings	Actions Taken/Database Correction
Tronox Pigments Inc (formerly Kerr-McGee)	Savannah, GA	Inorganic Chemicals	Manganese	Facility reported discharge of manganese based on sampling data from 2002 and the total plant flow rate in 2005. However, as a result of ceasing operation of the sulfate process mid-year in 2005, manganese discharges were expected to decrease significantly.	No changes made.
Various facilities		Various categories	Phosphorus (Yellow Or White)	Elemental phosphorus is not likely to be discharged by facilities, and is likely reported incorrectly. Based on calls to a couple of facilities regarding 2002 data.	Changed phosphorus yellow and white load to zero.
Viskase Corp	Loudon, TN	Plastics	Carbon Disulfide	Facility reported a carbon disulfide discharge using an anomalous data point collected in 2004. Based on information collected from pretreatment coordinator in 2008.	Changed the carbon disulfide load based on monitoring data for 2005.

4.7 Methodology, Data Sources, and Limitations References

1. ERG. 2007a. Eastern Research Group, Inc. Quality Assurance Project Plan for 2007 Annual Screening-Level Analysis of TRI and PCS Industrial Category Discharge Data. Chantilly, VA. (March 19). EPA-HQ-OW-2006-0771-0208.

2. ERG. 2007b. Eastern Research Group, Inc. Toxic Weighting Factors Developed for the Proposed 2008 Effluent Guidelines Plan. Chantilly, VA. (September). EPA-HQ-OW-2006-0771-0781.

3. OMB. 1987. Office of Management and Budget. *Standard Industrial Classification Manual*. Washington, DC. (Unknown).

4. U.S. EPA. 2000. EPCRA Section 313 Guidance for Reporting Toxic Chemicals Within the Dioxins and Dioxin-Like Compounds Category. EPA-745-B-00-021. Washington, DC. (December). EPA-HQ-OW-2003-0074-1150.

5. U.S. EPA. 2005a. Draft Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process. Washington, DC. June. EPA-HQ-OW-2004-0032-0857.

6. U.S. EPA. 2005b. 2005 Annual Screening-Level Analysis: Supporting the Annual Review of Existing Effluent Limitations Guidelines and Standards and Identification of New Point Source Categories for Effluent Limitations and Standards. EPA-821-B-05-003. Washington, DC. (August). EPA-HQ-OW-2004-0032-0901.

7. U.S. EPA. 2006a. Toxic Weighting Factor Development in Support of CWA 304(m) Planning Process. Washington, DC. (June). EPA-HQ-OW-2004-0032-1634.

8. U.S. EPA. 2006b. Technical Support Document for the 2006 Effluent Guidelines Program Plan. EPA-821-R-06-018. Washington, DC. (December). EPA-HQ-OW-2004-0032-2782.

9. U.S. EPA. 2007. Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan. EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

PART II: RESULTS OF THE 2008 ANNUAL REVIEW OF INDUSTRIAL CATEGORIES WITH EXISTING ELGS

5.0 2008 ANNUAL REVIEW OF EXISTING EFFLUENT LIMITATIONS GUIDELINES AND STANDARDS AND RANKING OF POINT SOURCE CATEGORIES

For the 2008 annual review, EPA conducted the following activities:

- Updated the reviews from previous years (i.e., revised the 2007 annual review results with new or corrected data);
- Performed new research: contacted industry to verify discharges, conducted literature searches, and collected additional data; and
- Solicited information from stakeholders through comment response and other stakeholder outreach (e.g., meetings with industry trade groups).

This section summarizes the results from the 2008 annual review (Section 5.1), presents the results of the 2008 screening-level review (Section 5.2), and presents the prioritization of categories for the 2008 annual review (Section 5.3).

5.1 Summary of the Results from the 2007 Annual Review

EPA published its 2007 annual review of existing ELGs as part of the Preliminary 2008 Plan on October 30, 2007 (72 FR 61335). In the 2007 annual review, EPA identified 12 point source categories that represent the bulk of the estimated toxic discharges (as measured by TWPE) from existing industrial point source categories. EPA ranked each point source category by the amount of toxic pollutants in its discharge (as measured by TWPE) and identified the CWT and Steam Electric Power Generating (Steam Electric) Categories as the two categories with the highest TWPE (accounting for more than 50 percent of the total TWPE). EPA identified nine additional categories with potentially high TWPE discharge estimates (accounting for more than 45 percent of existing point source category TWPE). EPA conducted a “detailed study” of the Steam Electric Category and “preliminary category reviews” of the 11 other categories based on the results of the 2007 screening-level review and stakeholder comments. Based on the findings from the detailed studies and preliminary category reviews, EPA identified four categories for detailed study in 2008: Steam Electric (Part 423), Coal Mining (Part 434), Oil and Gas Extraction (Part 435) (to assess whether to revise the limits to include Coal Bed Methane extraction as a new subcategory), and the Health Care Industry (including Hospitals (Part 460)).

In view of the annual nature of its reviews of existing ELGs, EPA believes that each annual review can and should influence succeeding annual reviews (e.g., by indicating data gaps, identifying new pollutants or pollution reduction technologies, or otherwise highlighting industrial categories for more detailed scrutiny in subsequent years). EPA used the findings, data and comments on the 2007 annual review to inform its 2008 annual review. The 2007 review built on the previous reviews by continuing to use the screening methodology and incorporating some refinements to assigning discharges to categories. EPA made similar refinements to assigning discharges to categories for the 2008 annual review.

5.2 Results of the 2008 Screening-Level Review

For the 2008 screening-level review, EPA used the combined results of the *TRIReleases2004_v3* and the *PCSLoads2004_v4* databases and the results of the *TRIReleases2005_v2* database, discussed in Section 4.6 of this document. When combining the results of the 2004 databases, EPA adjusted the rankings for the following: discharges from industrial categories for which EPA is currently developing or revising ELGs, discharges from point source categories for which EPA has recently promulgated or revised ELGs, and discharges from facilities determined not to be representative of their categories. Sections 5.2.1 through 5.2.3 discuss the rationale for these decisions. EPA made the same adjustments to the final ranking using the *TRIReleases2005_v2* database. The final combined database rankings represent the results of the 2008 screening-level review and are presented in Section 5.2.4.

5.2.1 Facilities for Which EPA Is Currently Developing or Revising ELGs

EPA is currently considering revisions to ELGs for OCPSF (40 CFR 414) and the Inorganic Chemicals Manufacturing (40 CFR 415) Point Source Categories for facilities that produce CCH.[6] Because the CCH rulemaking is underway, EPA excluded discharges from these facilities from further consideration under the current planning cycle. EPA subtracted the TWPE loads from facilities that produce chlorine or chlorinated hydrocarbons from the OCPSF and Inorganic Chemicals Manufacturing Point Source Category loads. Because facilities that produce chlorine and chlorinated hydrocarbons are only a subset of the OCPSF and Inorganic Chemicals Manufacturing Categories, EPA included loads for all other facilities in these two categories in its prioritization of categories for further review.

5.2.2 Categories for Which EPA Recently Promulgated or Revised ELGs

For the 2008 annual review and development of category rankings, EPA excluded point source categories for which ELGs were recently established or revised but not yet fully implemented, or were recently reviewed in a rulemaking context, but EPA decided to withdraw the proposal or select the “no action” option. This seven-year period allows time for the ELGs to be incorporated into NPDES permits. In general, EPA removed an industrial point source category from further consideration during the current review cycle if EPA had established, revised, or reviewed the category’s effluent guidelines after August 2001 (i.e., seven years prior to August 2008, the expected publication of the Final 2008 Plan). For the 2009 and 2010 annual reviews EPA will exclude any categories with ELGs established or revised after August 2002 and August 2003, respectively. Table 5-1 lists these categories.

Removing a point source category from further consideration in the development of the rankings does not mean that EPA eliminates the category from annual review. In cases where EPA is aware of the growth of a new segment within such category, or where new concerns are identified for previously unevaluated pollutants discharged by facilities in the category, EPA would apply closer scrutiny to the discharges from the category in deciding whether to consider it further during the current review cycle. For example, EPA conducted the detailed study of the coal mining industry based on comments received on the 2006 Preliminary Plan, although the coal mining ELGs were revised in January 2002.

[6] EPA is also currently revising ELGs for the following industries: Concentration Animal Feeding Operations and Construction and Development; however, the TWPE associated with these categories is low and does not affect the prioritization of categories based on TWPE. For more information on industries currently undergoing rulemakings, see http://www.epa.gov/guide/industry.html.

Table 5-1. Point Source Categories That Have Undergone a Recent Rulemaking or Review

40 CFR Part Number	Point Source Category	Date of Rulemaking
451	Concentrated Aquatic Animal Production (or Aquaculture)	August 23, 2004
432	Meat and Poultry Products	September 8, 2004
413, 433, and 438	Metal Products and Machinery (including Metal Finishing and Electroplating)	May 13, 2003
122, 123, and 412	Concentrated Animal Feeding Operations (CAFOs)	February 12, 2003
420	Iron and Steel Manufacturing	October 17, 2002
434	Coal Mining (Coal Remining and Western Alkaline Coal Mining)	January 23, 2002

Source: "Guidelines: Final, Proposed, and Under Development" at http://www.epa.gov/waterscience/guide (U.S. EPA, 2006a).

5.2.3 Categories with One Facility Dominating the TWPE

EPA identified point source categories with significant TWPE where only one facility was responsible for most of the TWPE reported to be discharged (i.e., where one facility's TWPE accounted for more than 95 percent of the category TWPE, but was not the only facility reporting discharges for the category). Table 5-2 lists these categories. EPA identified seven facilities that dominated the TWPE in the category to which they belonged. EPA investigated these facilities to determine if their discharges were representative of the category. If they were not, EPA subtracted the facility's TWPE from the total category TWPE and recalculated the category's ranking. EPA performed this analysis separately for each of the three databases.

Three facilities in the TRI 2004 and TRI 2005 databases accounted for more than 95 percent of the category TWPE for the categories with significant TWPE:

- Vopak Logistics Services USA Inc.;
- Clean Harbors Deer Park LP; and
- Dow Freeport Co., Freeport Facility.

EPA reviewed these facilities' discharges and determined that they are representative of the respective categories and should be included in the category totals.

Table 5-2. Point Source Categories with One Facility Dominating the TWPE Discharges

Point Source Category	Facility with Over 95% of Category TWPE	City, State	Data Source	Pollutant Driving TWPE	Facility TWPE	% of Total Category TWPE	Action
Centralized Waste Treaters (Part 437)	Vopak Logistics Services USA Inc.	Deer Park, TX	TRI 2004	Diazinon	7,029,354	94.2%	Did not remove load from category TWPE
Pesticide Chemicals (Part 455)	Dow Freeport Co., Freeport Facility	Freeport, TX	TRI 2004	Picloram	492,108	94.9%	Did not remove load from category TWPE
Waste Combustors (Commercial Incinerators Combusting Hazardous Waste) (Part 444)	Clean Harbors Deer Park LP	Deer Park, TX	TRI 2004	Benzidine	242,547	99.9%	Did not remove load from category TWPE
			TRI 2005	Toxaphene	51,859	99.3%	Did not remove load from category TWPE

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.

5.2.4 Results of the 2008 Screening-Level Review

After adjusting the category TWPE totals and rankings as described in Sections 5.2.1 through 5.2.3, EPA consolidated the 2004 PCS and TRI rankings into one set using the following steps:

- EPA combined the two lists of point source categories by adding each category's PCS TWPE and TRI TWPE. EPA noted that this may result in "double-counting" of chemicals a facility reported to both PCS and TRI, and "single-counting" of chemicals reported in only one of the databases. The combined databases do not count chemicals that may be discharged but are not reported to PCS or TRI.
- EPA then ranked the point source categories based on total PCS and TRI TWPE.

Table 5-3 presents the combined PCS 2004 and TRI 2004 rankings. These are the final category rankings accounting for all corrections made to the databases during the 2007 and 2008 annual reviews and removal of any categories and discharges as discussed in Sections 5.2.1 through 5.2.3.

Table 5-4 presents the final rankings for TRI 2005 excluding the categories for which EPA is currently developing or revising ELGs, categories for which EPA recently promulgated or revised ELGs, and discharges from facilities that dominate the category TWPE, but are not representative of the category. Four of the top five categories by TWPE from the combined TRI and PCS 2004 data (Table 5-3) are in the top five categories from the TRI 2005 data (Table 5-4), with only the Fertilizer Category not represented at the top of TRI 2005 rankings.

5.3 <u>Prioritization of Categories for the 2008 Annual Review</u>

Based on its screening-level review, EPA was able to prioritize for further review (i.e., a detailed study or preliminary category review) those industrial categories whose pollutant discharges potentially pose the greatest hazards to human health or the environment because of their toxicity (i.e., categories that collectively discharge over 95 percent of the total TWPE). EPA also considered efficiency and implementation issues raised by stakeholders in identifying candidates for further review. By using this multilayered screening approach, the Agency concentrated its resources on those point source categories with the highest estimates of toxic-weighted pollutant discharges (based on best available data), while assigning a lower priority to categories that the Agency believes are not good candidates for ELGs revision at this time.

Table 5-5 lists the point source categories with existing ELGs, the level of review EPA performed as part of the 2008 annual review, and how the category was identified for further review, if applicable.

Table 5-3. Final PCS 2004 and TRI 2004 Combined Point Source Category Rankings

40 CFR Part	Point Source Category	TRI 2004 TWPE	PCS 2004 TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
437	Centralized Waste Treaters	7,460,703	8,731	7,469,434	39.9%	1
423	Steam Electric Power Generation	791,179	2,410,093	3,201,272	57.0%	2
419	Petroleum Refining	669,434	818,705	1,488,139	64.9%	3
414	Organic Chemicals, Plastics and Synthetic Fibers	957,134	490,290	1,447,424	72.7%	4
418	Fertilizer Manufacturing	10,843	1,168,160	1,179,003	79.0%	5
430	Pulp, Paper and Paperboard	668,518	164,787	833,306	83.4%	6
440	Ore Mining and Dressing	88,001	580,831	668,832	87.0%	7
455	Pesticide Chemicals Manufacturing	518,385	102,256	620,641	90.3%	8
415	Inorganic Chemicals	122,514	309,022	431,536	92.6%	9
421	Nonferrous Metals Manufacturing	52,599	321,299	373,898	94.6%	10
444	Waste Combustors (Commercial Incinerators Combusting Hazardous Waste)	242,888	9,087	251,975	95.9%	11
410	Textile Mills	3,043	123,392	126,435	96.6%	12
463	Plastic Molding and Forming	72,657	10,766	83,423	97.1%	13
422	Phosphate Manufacturing	1,064	74,218	75,282	97.5%	14
429	Timber Products Processing	63,885	443	64,328	97.8%	15
436	Mineral Mining and Processing	5,387	49,315	54,702	98.1%	16
454	Gum And Wood Chemicals	6,311	46,446	52,757	98.4%	17
458	Carbon Black Manufacturing	48,603		48,603	98.6%	18
467	Aluminum Forming	3,318	27,580	30,897	98.8%	19
439	Pharmaceutical Manufacturing	10,706	13,255	23,962	98.9%	20
464	Metal Molding and Casting (Foundries)	19,147	4,746	23,893	99.1%	21
471	Nonferrous Metals Forming and Metal Powders	10,033	11,599	21,632	99.2%	22
411	Cement Manufacturing	898	17,461	18,359	99.3%	23
424	Ferroalloy Manufacturing	11,327	6,431	17,758	99.4%	24
468	Copper Forming	10,573	3,644	14,217	99.4%	25
469	Electrical and Electronic Components	7,693	4,890	12,583	99.5%	26

Table 5-3. Final PCS 2004 and TRI 2004 Combined Point Source Category Rankings

40 CFR Part	Point Source Category	TRI 2004 TWPE	PCS 2004 TWPE	Total TWPE	Cumulative Percent of Total TWPE	Rank
409	Sugar Processing	200	11,919	12,118	99.6%	27
425	Leather Tanning and Finishing	8,832	705	9,537	99.6%	28
445	Landfills	152	9,087	9,239	99.7%	29
407	Fruits and Vegetable Processing	6,392	2,457	8,849	99.7%	30
461	Battery Manufacturing	2,441	5,169	7,610	99.8%	31
428	Rubber Manufacturing	5,695	1,667	7,362	99.8%	32
406	Grain Mills Manufacturing	4,336	2,427	6,763	99.8%	33
417	Soaps and Detergents Manufacturing	6,156	80	6,236	99.9%	34
426	Glass Manufacturing	2,822	2,707	5,529	99.9%	35
NA	Tobacco Products	5,159	2	5,161	99.9%	36
405	Dairy Products Processing	3,710	41	3,751	99.9%	37
NA	Printing and Publishing	177	2,190	2,367	100.0%	38
457	Explosives	93	2,273	2,366	100.0%	39
443	Paving and Roofing Materials (Tars and Asphalt)	612	1,313	1,924	100.0%	40
408	Canned and Preserved Seafood	198	828	1,027	100.0%	41
435	Oil and Gas Extraction	596	18	613	100.0%	42
NA	Independent and Stand Alone Labs	205	269	474	100.0%	43
466	Porcelain Enameling	247	7	254	100.0%	44
NA	Construction and Development	—	231	231	100.0%	45
446	Paint Formulating	210	—	210	100.0%	46
465	Coil Coating	167	—	167	100.0%	47
447	Ink Formulating	42	—	42	100.0%	48
460	Hospital	—	14	14	100.0%	49
	Total	**11,905,285**	**6,820,849**	**18,726,133**		

Source: *TRIReleases2004_v3*; *PCSLoads2004_v4*.
NA — Not applicable; no existing ELGs apply to discharges.

Table 5-4. Final TRI 2005 Rankings

40 CFR Part	Point Source Category	Total Pounds Released, all Chemicals	TWPE
437	Centralized Waste Treatment	724,164	4,282,304
423	Steam Electric Power Generating	2,880,742	851,876
414	Organic Chemicals, Plastics and Synthetic Fibers	35,350,810	758,964
430	Pulp, Paper and Paperboard	22,479,514	639,419
419	Petroleum Refining	17,930,959	627,618
415	Inorganic Chemicals Manufacturing	7,795,516	92,146
440	Ore Mining and Dressing	399,164	76,673
444	Waste Combustors	4,541	52,251
429	Timber Products Processing	50,751	51,469
458	Carbon Black Manufacturing	509	47,095
421	Nonferrous Metals Manufacturing	3,892,225	41,771
455	Pesticide Chemicals	1,416,983	31,417
454	Gum and Wood Chemicals Manufacturing	14,807	24,746
463	Plastics Molding and Forming	1,759,032	22,294
464	Metal Molding and Casting (Foundries)	238,902	13,814
471	Nonferrous Metals Forming and Metal Powders	1,476,557	13,058
425	Leather Tanning and Finishing	410,478	12,240
439	Pharmaceutical Manufacturing	1,930,453	11,849
468	Copper Forming	99,219	9,728
424	Ferroalloy Manufacturing	205,459	8,353
418	Fertilizer Manufacturing	4,972,723	7,307
503	Miscellaneous Foods and Beverages	5,851,557	6,670
436	Mineral Mining and Processing	2,414,860	6,262
NA	Tobacco Products	181,818	5,836
469	Electrical and Electronic Components	4,728,033	5,766
407	Canned and Preserved Fruits and Vegetables Processing	4,728,033	5,766
406	Grain Mills	6,186,932	5,139
405	Dairy Products Processing	1,721,519	4,877
428	Rubber Manufacturing	5,754,217	4,344
467	Aluminum Forming	677,583	4,305
410	Textile Mills	556,449	3,256
461	Battery Manufacturing	754,748	3,037
417	Soap and Detergent Manufacturing	54,406	2,578
501	Drinking Water Treatment	105,492	2,155
426	Glass Manufacturing	28,622	1,987
411	Cement Manufacturing	186,900	958
435	Oil and Gas Extraction	62,242	802
443	Paving and Roofing Materials (Tars and Asphalt)	4,351	677
422	Phosphate Manufacturing	269	515

Table 5-4. Final TRI 2005 Rankings

40 CFR Part	Point Source Category	Total Pounds Released, all Chemicals	TWPE
446	Paint Formulating	36,345	368
465	Coil Coating	124,571	331
409	Sugar Processing	5,333	181
408	Canned and Preserved Seafood Processing	205,929	180
NA	Printing and Publishing	190,618	145

Source: *TRIReleases2005_v2*.
NA — Not applicable; no existing ELGs apply to discharges.

Table 5-5. 2008 Annual Review of Categories with Existing ELGs: Level of Review

40 CFR Part	Point Source Category	Level of Review	Source of Identification for Further Review
405	Dairy Products Processing	Screening-Level Review	NA [a]
406	Grain Mills Manufacturing	Screening-Level Review	NA [a]
407	Fruits and Vegetable Processing	Screening-Level Review	NA [a]
408	Canned and Preserved Seafood	Screening-Level Review	NA [a]
409	Sugar Processing	Screening-Level Review	NA [a]
410	Textile Mills	Screening-Level Review	NA [a]
411	Cement Manufacturing	Screening-Level Review	NA [a]
412	Concentrated Animal Feeding Operations	Screening-Level Review	NA [a]
413	Electroplating	Screening-Level Review	NA [a]
414	Organic Chemicals, Plastics and Synthetic Fibers	Preliminary Review	TWPE
415	Inorganic Chemicals	Screening-Level Review	NA [a]
417	Soaps and Detergents Manufacturing	Screening-Level Review	NA [a]
418	Fertilizer Manufacturing	Screening-Level Review	NA [a]
419	Petroleum Refining	Preliminary Review	TWPE
420	Iron and Steel Manufacturing	Screening-Level Review	NA [a]
421	Nonferrous Metals Manufacturing	Screening-Level Review	NA [a]
422	Phosphate Manufacturing	Screening-Level Review	NA [a]
423	Steam Electric Power Generation	Detailed Study	TWPE
424	Ferroalloy Manufacturing	Screening-Level Review	NA [a]
425	Leather Tanning and Finishing	Screening-Level Review	NA [a]
426	Glass Manufacturing	Screening-Level Review	NA [a]
427	Asbestos Manufacturing	Screening-Level Review	NA [a]
428	Rubber Manufacturing	Screening-Level Review	NA [a]
429	Timber Products Processing	Screening-Level Review	NA [a]
430	Pulp, Paper and Paperboard	Preliminary Review	TWPE
432	Meat and Poultry Products	Screening-Level Review	NA [a]

Table 5-5. 2008 Annual Review of Categories with Existing ELGs: Level of Review

40 CFR Part	Point Source Category	Level of Review	Source of Identification for Further Review
433	Metal Finishing	Screening-Level Review	NA [a]
434	Coal Mining	Detailed Study	Comments
435	Oil and Gas Extraction	Detailed Study (of Coal Bed Methane Operations)	Comments
436	Mineral Mining and Processing	Screening-Level Review	NA [a]
437	Centralized Waste Treaters	Preliminary Review	TWPE
438	Metal Products and Machinery	Screening-Level Review	NA [a]
439	Pharmaceutical Manufacturing	Screening-Level Review	NA [a]
440	Ore Mining and Dressing	Preliminary Review	TWPE
442	Transportation Equipment Cleaning	Screening-Level Review	NA [a]
443	Paving and Roofing Materials (Tars and Asphalt)	Screening-Level Review	NA [a]
444	Waste Combustors (Commercial Incinerators Combusting Hazardous Waste)	Preliminary Review	TWPE
445	Landfills	Screening-Level Review	NA [a]
446	Paint Formulating	Screening-Level Review	NA [a]
447	Ink Formulating	Screening-Level Review	NA [a]
451	Aquatic Animal Production Industry	Screening-Level Review	NA [a]
454	Gum and Wood Chemicals	Screening-Level Review	NA [a]
455	Pesticide Chemicals Manufacturing	Screening-Level Review	NA [a]
457	Explosives	Screening-Level Review	NA [a]
458	Carbon Black Manufacturing	Screening-Level Review	NA [a]
459	Photographic	Screening-Level Review	NA [a]
460	Hospital	Detailed Study (of Health Care Industry)	Comments
461	Battery Manufacturing	Screening-Level Review	NA [a]
463	Plastic Molding and Forming	Screening-Level Review	NA [a]
464	Metal Molding and Casting (Foundries)	Screening-Level Review	NA [a]
465	Coil Coating	Screening-Level Review	NA [a]
466	Porcelain Enameling	Screening-Level Review	NA [a]
467	Aluminum Forming	Screening-Level Review	NA [a]
468	Copper Forming	Screening-Level Review	NA [a]
469	Electrical and Electronic Components	Screening-Level Review	NA [a]
471	Nonferrous Metals Forming and Metal Powders	Screening-Level Review	NA [a]

a — For categories with only a screening-level review, the source of identification is not applicable, as EPA conducts a screening-level review of all categories subject to existing effluent guidelines. The “source of identification” is only applicable for those industries selected for further review.
NA — Not available.

5.3.1 Detailed Study of Existing ELGs

EPA performed detailed studies on four point source categories as part of its 2008 annual review based on the results of its 2007 screening-level review. EPA continued a detailed study of the Steam Electric Category (Part 423) because EPA data collection is not complete. Also, the Steam Electric Category ranked second in combined TWPE rankings. EPA also identified Coal Mining (Part 434), Oil and Gas Extraction (Part 435) (to assess whether to revise the limits to include coalbed methane extraction as a new subcategory), and the Health Services Industry (includes Hospitals (Part 460)) as detailed studies for the 2007 and 2008 annual reviews based on comments on the 2006 Preliminary Plan.

EPA did not select the CWT Category (Part 437) as a detailed study because the category had been excluded from previous screening-level reviews due to the ELG being recently promulgated (December 22, 2000). EPA determined it would conduct a preliminary review of the CWT Category before to conducting a detailed study.

EPA’s detailed studies generally examine the following: (1) wastewater characteristics and pollutant sources; (2) the pollutants driving the toxic-weighted pollutant discharges; (3) availability of pollution prevention and treatment; (4) the geographic distribution of facilities in the industry; (5) any pollutant discharge trends within the industry; and (6) any relevant economic factors. First, EPA attempts to verify the screening-level results and fill in data gaps. Next, EPA considers costs and performance of applicable and demonstrated technology, process change, or pollution prevention alternatives that can effectively reduce the pollutants remaining in the industrial category's wastewater. Last, EPA considers the affordability or economic achievability of the technology, process change, or pollution prevention measures identified above.

Types of data sources that EPA may consult in conducting its detailed studies include, but are not limited to: (1) the U.S. Economic Census; (2) TRI and PCS data; (3) trade associations and reporting facilities to verify reported releases and facility categorization; (4) regulatory authorities (states and EPA regions) to understand how category facilities are permitted; (5) NPDES permits and their supporting fact sheets; (6) EPA effluent guidelines technical development documents; (7) relevant EPA preliminary data summaries or study reports; and (8) technical literature on pollutant sources and control technologies.

For more information about the Steam Electric Detailed Study, Coal Mining Detailed Study, Oil and Gas Extraction Detailed Study (Coalbed Methane Industry), and Health Services Industry Detailed Study, see Part III of this report (U.S. EPA, 2008a; U.S. EPA, 2008b; U.S. EPA, 2008c; U.S. EPA, 2008d).

5.3.2 Preliminary Review

Preliminary reviews are similar to detailed studies and have the same purpose. During preliminary reviews, EPA generally examines the same items listed above for detailed studies. However, EPA’s preliminary review of a category and available pollution prevention and treatment options is less rigorous than its detailed studies. While EPA collects and analyzes hazard and technology-based information on categories undergoing preliminary review, it assigns a higher priority to investigating categories undergoing detailed studies.

For its 2008 annual review, EPA selected categories for preliminary review based on TWPE in the 2004 PCS and TRI and 2005 TRI databases. In 2007, EPA reviewed the categories accounting for the top 95 percent of total PCS 2004 and TRI 2004 combined TWPE, and identified 11 point source categories for preliminary review (U.S. EPA, 2007). Of those 11 point source categories, EPA identified six for continued preliminary review as part of the 2008 annual review (72 FRN 61335).[7] These categories account for approximately 64 percent of the cumulative PCS 2004 and TRI 2004 combined TWPE. The six preliminary reviews identified are listed below, along with a reference to where they are discussed in this report:

- CWT (Section 6.0);
- OCPSF(Section 7.0);
- Ore Mining and Dressing (Section 8.0);
- Petroleum Refining (Section 9.0);
- Pulp, Paper, and Paperboard (Section 10.0); and
- Waste Combustors (Section 11.0).

EPA recently conducted detailed studies or preliminary reviews of many of the categories listed above. Table 5-6 lists these categories and the level of review EPA performed for its 2003 through 2006 annual reviews. For each of these categories, because EPA's annual review builds on previous reviews, EPA primarily looked at the pollutants reported in 2004 and 2005 and their contribution to their category's TWPE. EPA then compared these more recent results to its previous studies and reviews. EPA excluded CWT (40 CFR Part 437) and Waste Combusters (40 CFR Part 444) from further review in 2003 through 2006, because EPA applies less scrutiny to industrial categories with promulgated effluent guidelines or pretreatment standards within the past seven years (see Section 5.2.2).

Table 5-6. Previous Reviews for Point Source Categories Reviewed as Part of the 2008 Annual Review

40 CFR Part	Point Source Category	Level of Review for 2003/2004	Level of Review for 2005/2006	Level of Review for 2007/2008
423	Steam Electric	Preliminary Category Review	Detailed Study	Detailed Study
434	Coal Mining	NA	Preliminary Category Review	Detailed Study
435	Oil and Gas Extraction (Coalbed Methane)	NA	Preliminary Category Review	Detailed Study
460	Hospitals (Health Services)	NA	Preliminary Category Review	Detailed Study
419	Petroleum Refining	Detailed Study	Preliminary Category Review	Preliminary Category Review
414	OCPSF	Detailed Study	Preliminary Category Review	Preliminary Category Review
430	Pulp, Paper, and Paperboard	Preliminary Category Review	Detailed Study	Preliminary Category Review

[7] EPA has identified that no further review is necessary at this time (72 FRN 61335).

Table 5-6. Previous Reviews for Point Source Categories Reviewed as Part of the 2008 Annual Review

40 CFR Part	Point Source Category	Level of Review for 2003/2004	Level of Review for 2005/2006	Level of Review for 2007/2008
440	Ore Mining and Dressing	Preliminary Category Review	Preliminary Category Review	Preliminary Category Review
437	Centralized Waste Treaters	NA [a]	NA [a]	Preliminary Category Review
444	Waste Combustors	NA [a]	NA [a]	Preliminary Category Review

a — Centralized Waste Treaters and Waste Combustors were not reviewed in 2003 through 2006 because the regulations were promulgated in 2000.
NA — Not applicable.

5.4 2008 Annual Review of Existing Effluent Limitations Guidelines and Standards and Ranking of Point Source Categories References

1. U.S. EPA. 2006a. Guidelines: Final, Proposed, and Under Development. "Industrial Waters Pollution Control." Available online at: http://www.epa.gov/waterscience/guide.

2. U.S. EPA. 2006. *Technical Support Document for the 2006 Effluent Guidelines Program Plan*. EPA-821R-06-018. Washington, DC. (December). EPA-HQ-OW-2004-0032-2782.

3. U.S. EPA. 2007. *Technical Support Document for the Preliminary 2008 Effluent Guidelines Program Plan*. EPA-821-R-07-007. Washington, DC. (October). EPA-HQ-OW-2006-0771-0819.

4. U.S. EPA. 2008a. *Coal Mining Detailed Study*. EPA-821-R-08-012 Washington, DC. (August). EPA-HQ-OW-2006-0771 DCN 05517.

5. U.S. EPA. 2008b. *Health Services Industry Detailed Study: Dental Amalgam*. EPA-821-R-08-014 Washington, DC. (August). EPA-HQ-OW-2006-0771 DCN 05518.

6. U.S. EPA. 2008c. *Health Services Industry Detailed Study: Management and Disposal of Unused Pharmaceuticals (Interim Technical Report)*. EPA-821-R-08-013 Washington, DC. (August). EPA-HQ-OW-2006-0771 DCN 05519.

7. U.S. EPA. 2008d. *Steam Electric Power Generating Point Source Category: 2007/2008 Detailed Study Report*. EPA-821-R-08-011 Washington, DC. (August). EPA-HQ-OW-2006-0771 DCN 05516.

6.0 CENTRALIZED WASTE TREATMENT (40 CFR PART 437)

EPA selected the Centralized Waste Treatment (CWT) Category for a preliminary review from its 2007 annual review because it ranked high, in terms of TWPE, in point source category rankings (see Tables 5-3 and 5-4 for the most recent point source category rankings). EPA began the preliminary review of this industry in 2007 and published the results as part of the 2008 Preliminary ELG Plan (72 FR 61335). As part of the 2008 annual review, EPA continued the preliminary review by investigating possible pesticide discharges from the CWT Category. EPA has determined that no further review of pesticide discharges from the CWT Category is necessary at this time.

6.1 CWT Category Background

This subsection provides background on the CWT Category, including a brief profile of the CWT industry and background on 40 CFR Part 437.

6.1.1 CWT Industry Profile

The CWT industry includes facilities that treat and/or recover hazardous or non-hazardous industrial waste, wastewater, or used material from other manufacturing facilities. Many of the wastes received by CWT facilities contain very high pollutant concentrations compared to manufacturing facilities' wastes and can often be difficult to treat. EPA identified CWT facilities by the primary SIC codes in the PCS and TRI databases, as described in Section 4.5 of this document. The SIC code 4953, Refuse Systems, includes CWT facilities but also includes landfills and commercial waste combustors, whose wastewater discharges are regulated by 40 CFR Parts 444 and 445 (the Waste Combustors and Landfills Categories, respectively).

EPA reviewed all of the facilities reporting SIC code 4953 to identify the facilities that are in the CWT Category rather than the Waste Combustors and Landfills Categories. Table 6-1 presents the number of facilities identified as CWTs during its review of other categories.

Table 6-1. Number of Facilities Identified as CWTs

2004 PCS [a]	2004 TRI [b]	2005 TRI [b]
4	36 [c]	36 [c]

Source: *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Major and minor dischargers.
b — Releases to any media.
c — These counts include two waste combustor facilities, which will be corrected in future TRI databases. EPA contacted facilities and found that two facilities initially identified as CWT facilities are actually waste combustors. These facilities contribute negligible TWPE (approximately 95 TWPE for 2005) and therefore, have no impact on the overall category TWPE or rankings. These changes are further discussed in Section 11.0, "Waste Combustors".

CWTs discharge directly to surface water as well as to POTWs. Table 6-2 presents the types of discharges reported by facilities in the 2004 and 2005 TRI databases. The majority of CWTs reporting to TRI reported discharging indirectly.

Table 6-2. Centralized Waste Treatment Category Facilities by Type of Discharge Reported in TRI 2004 and 2005

TRI 2004 [a]				TRI 2005 [a]			
Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
8	17	6	5	7	18	5	6

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — These counts include two waste combustor facilities, which will be corrected in future TRI databases. EPA contacted facilities and found that two facilities initially identified as CWT facilities are actually waste combustors. These facilities contribute negligible TWPE (approximately 95 TWPE for 2005) and therefore, have no impact on the overall category TWPE or rankings. These changes are further discussed in Section 11.0, "Waste Combustors".

6.1.2 40 CFR Part 437

EPA first promulgated ELGs for the CWT Category (40 CFR Part 437) in 2000 (65 FR 81241), with amendments made in 2003 (68 FR 71014). This category is divided into four subcategories based on type of waste received, shown in Table 6-3. The technology basis for the final rule varies by type of waste the facility is treating:

- Two-stage chemical precipitation and filtration for metal-bearing wastes;
- Emulsion breaking, two-stage gravity separation and dissolved air flotation for oily wastes; and
- Equalization and biological treatment for organic wastes.

To ensure that combined wastes are treated, not simply co-diluted, facilities that elect to comply with Subpart D, Multiple Wastestreams, must certify that an equivalent treatment system is installed and properly designed, maintained, and operated.

Table 6-3 lists the pollutants regulated by Part 437. Pesticides are not regulated in any subcategory, as discussed in Section 6-4 of this document.

Table 6-3. Part 437 Subcategories and Regulated Pollutants

Subpart Name	Subpart Applicability	Regulated Pollutants
A: Metals Treatment and Recovery	The discharge of wastewater from a CWT facility that results from the treatment of, or recovery of metals from, both metal-bearing wastes received from off-site and other CWT wastewater associated with the treatment of, or recovery of metal-bearing wastes.	Oil and Grease, pH, TSS, Antimony, Arsenic, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Silver, Tin, Titanium, Vanadium, and Zinc
B: Oils Treatment and Recovery	The discharge of wastewater from a CWT facility that results from the treatment or recovery of oil from both oily wastes received from off-site and other CWT wastewater associated with the treatment of, or recovery of oily wastes.	Oil and Grease, pH, TSS, Arsenic, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Tin, Zinc, Bis(2-ethylhexyl) Phthalate, Butylbenzyl Phthalate, Carbazole, n-Decane, Flouranthene, and n-Octadecane

Table 6-3. Part 437 Subcategories and Regulated Pollutants

Subpart Name	Subpart Applicability	Regulated Pollutants
C: Organics Treatment and Recovery	The discharge of wastewater from a CWT facility that results from the treatment of, or recovery of organic material from both organic wastes received from off-site and other CWT wastewater associated with the treatment of, or recovery of organic wastes.	BOD5, pH, TSS, Copper, Zinc, Acetone, Acetophenone, 2-Butanone, o-Cresol, p-Cresol, Phenol, Pyridine, and 2,4,6-Trichlorophenol
D: Multiple Wastestreams	The discharges of wastewater from a CWT facility that treats wastes subject to more than one of the previous Subparts must comply with either provisions of this subpart or the applicable provisions of Subpart A, B, or C. The provisions of this subpart are applicable to that portion of wastewater discharges from a centralized waste treatment facility that results from mixing any combination of treated or untreated waste otherwise subject to Subpart A, Subpart B, or Subpart C of this part only if a facility requests the permit writer or control authority to develop Subpart D limitations (or standards) and establishes that it provides equivalent treatment as defined in §437.2(h).	BOD5, Oil and Grease, pH, TSS, Antimony, Arsenic, Cadmium, Chromium, Cobalt, Copper, Cyanide, Lead, Mercury, Nickel, Silver, Tin, Titanium, Vanadium, and Zinc, Acetone, Acetophenone, Bis(2-ethylhexyl) phthalate, 2-Butanone, Carbazole, o-Cresol, p-Cresol, n-Decane, Flouranthene, n-Octadecane, Phenol, Pyridine, and 2,4,6-Trichlorophenol

Source: 40 CFR Part 437; *Development Document for Final Effluent Limitations Guidelines and Standards for the Centralized Waste Treatment Industry* (U.S. EPA, 2000).

6.2 CWT Category 2004 Through 2008 Screening-Level Reviews

The CWT Category was excluded from previous annual reviews because the ELG had been promulgated recently (December 22, 2000). Table 6-4 shows the screening-level results for the CWT Category from the TRI and PCS databases composed between 2002 and 2005. Both the 2004 TRI and PCS TWPEs increased compared to previous years. However, the 2005 TRI TWPE decreased compared to the 2004 TRI TWPE. The increase in TWPE from the 2002 and 2003 data sources to the 2004 and 2005 data sources could result from permit modifications that incorporate the limitations from the promulgated ELGs.

Table 6-4. CWT Category Screening-Level Results

Year of Review	Year of Data Source	Centralized Waste Treatment Category [a]	
		TRI TWPE [b]	PCS TWPE
2005	2002	38,123	3,423
2006	2003	65,250	NA
2007	2004	7,460,703	8,731
2008	2005	4,282,304	NA

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2; PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Direct and indirect water releases only.
b — This table includes the TWPE from two waste combustor facilities, which will be corrected in future databases. EPA contacted facilities and found that two facilities initially identified as CWT facilities are actually waste combustors. These facilities contribute negligible TWPE and therefore, have no impact on the overall category TWPE or rankings. These changes are further discussed in Section 11.0, Waste Combustors.
NA — Not applicable. EPA did not evaluate PCS data for 2003 and 2005.

6.3 CWT Category 2004 through 2008 Pollutants of Concern

Table 6-5 shows the five pollutants with the highest TWPE in *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2004_v3* for the CWT Category. Because EPA did not conduct preliminary reviews of the CWT Category in 2005 and 2006, EPA did not identify the pollutants with the highest TWPE from the 2002 and 2003 TRI databases or the 2002 PCS database.

The CWT Category TWPE in 2004 PCS are significantly lower than the TRI 2004 or 2005 TWPE. Therefore, EPA focused the additional review on the TRI-reported pollutants that account for the majority of the category TWPE.

Pesticides, including diazinon, malathion, and heptachlor, are the top TRI-reported pollutants in 2004 and 2005, contributing more than 92 percent of the total category TWPE for both 2004 and 2005. Polycyclic aromatic compounds (PACs) in TRI are the pollutant with the third highest TWPE in TRI 2004 and TRI 2005. EPA's additional review for the pollutants of concern is presented in the following sections:

- Section 6.4: Pesticides from TRI; and
- Section 6.5: PACs from TRI.

6.4 CWT Category Pesticide Discharges

EPA reviewed discharges of pesticides from CWTs because they ranked high, in terms of TWPE, in the PCS and TRI databases. For the 2008 preliminary review, EPA contacted facilities and collected additional discharge data to determine the following:

1. That pesticide discharges were based on actual discharges, not estimated based on concentrations of pesticides below analytical minimum levels.
2. Whether CWTs had an increased receipt of pesticide waste as a result of regulation of wastewater from the pesticides formulating, packaging, and repackaging (PFPR) industry (U.S. EPA, 1996).
3. Pesticide treatment effectiveness, using data from EPA's Pesticides Chemicals ELG rulemaking (U.S. EPA, 1996). Table 6-10 at the end of this section summarizes EPA's treatment efficiency data from the Pesticides Formulators, Packagers, and Re-packagers (PFPR) rulemaking.

Table 6-5. 2008 Review: CWT Category Pollutants of Concern

Pollutant	PCS 2004 [a]			TRI 2004 [b, d]			TRI 2005 [b]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Zinc	3	103,596	4,857	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Sulfide	2	912	2,555						
Cadmium	1	21	493						
Barium	2	155,451	309						
Arsenic	2	44	176						
Diazinon	Pollutants are not in the top five PCS 2004 reported pollutants.			1	10,282	6,398,170	1	5,841	3,634,709
Malathion				1	10,283	575,931	1	5,840	327,077
PACs				1	2,600	261,716	1	2,400	241,584
Heptachlor				1	9	76,767	1	2.4	20,471
Chlordane				1	35	69,763	Pollutant is not in the top five TRI 2005 reported pollutants		
Acrylonitrile				Pollutant is not in the top five TRI 2004 reported pollutants			1	16,289	37,126
CWT Category Total	**4 [c]**	**10,465,007,382**	**8,730**	**5 [c]**	**18,835,213**	**7,460,703**	**5 [c]**	**724,164**	**4,282,304**

Source: *PCSLoads2004_v4; TRIReleases2004_v3; TRIReleases2005_v2*.
a — Discharges include only major dischargers.
b — Discharges include transfers to POTWs and account for POTW removals.
c — Number of facilities reporting TWPE greater than zero.
d — This table includes the TWPE from two waste combustor facilities, which will be corrected in future databases. EPA contacted facilities and found that two facilities initially identified as CWT facilities are actually waste combustors. These facilities contribute negligible TWPE and therefore, have no impact on the overall category TWPE or rankings. These changes are further discussed in Section 11.0, “Waste Combustors”.
PACs — Polycyclic aromatic compounds.

40 CFR Part 437 does not include limitations or standards for pesticides. At the time of the rulemaking, EPA collected samples at two CWT facilities and analyzed the samples for the entire spectrum of chemical compounds for which EPA had approved analytical methods. This included pesticides and herbicides. EPA found that pesticides/herbicides were only found in low concentrations (U.S. EPA, 1994). However, EPA did not analyze the samples for diazinon or malathion — the two pesticides with the highest TWPE in the 2004 and 2005 TRI databases for the CWT Category. As of December 31, 2004, it is unlawful to sell outdoor, non-agricultural diazinon products in the United States. It is, however, legal for consumers to use diazinon products, provided they follow all label directions and precautions (U.S. EPA, 2007). Because some CWT facilities are permitted to accept hazardous waste, CWT facilities may receive waste diazinon for some time even though it is no longer sold in the United States.

Discharges of pesticide chemicals in the TRI 2004 and 2005 databases account for the majority of the total category's TWPE. EPA examined discharges of pesticides from CWTs for the preliminary review of this category. EPA contacted five facilities about their pesticide discharges reported to TRI in 2004 and 2005, presented in Table 6-6. EPA identified two facilities for additional review of their TRI-reported pesticide discharges because they account for all of the CWT Category pesticide TWPE:

- Vopak Logistics Services — Deer Park, TX (Section 6.4.1); and
- DuPont Chambers Works — Deepwater, NJ (Section 6.4.2).

Table 6-6 summarizes findings from EPA's contacts to CWTs regarding pesticides reports to TRI. EPA found that only one CWT facility, DuPont Chambers Works, detected pesticides in water discharges from CWT operations.

EPA found that CWTs report pesticide releases to TRI based on waste characterization reports provided by their clients rather than wastewater monitoring data. Waste characterization reports include a list of all possible contaminants in a delivered waste stream with an estimated concentration range for each contaminant. Some CWTs require testing of a fraction of influent wastes (e.g., 10 percent of all influent wastewater) to verify the accuracy of waste characterization reports.

CWTs use either the midpoint or the maximum concentration of each constituent in their waste characterization reports to estimate what is being treated at the facility. The facility may calculate a pollutant loading which is then reduced by a removal efficiency or destruction efficiency to account for the pollutants removed during treatment. Although this method of estimation is appropriate for TRI reporting, it does not accurately reflect wastewater discharges. Of the facilities contacted, four facilities had tested for pesticides in their wastewater. Only one of these facilities reported detecting pesticides during sampling.

Table 6-6. Summary of CWT Pesticide Facility Contacts

Facility Name	City	Facility TWPE from TRI 2005	Facility Receives Pesticides?	Facility Detected Pesticides?	Comments
Vopak Logistics Services USA Inc.	Deer Park, TX	4,000,309	Yes	No	Vopak reports releases of a variety of pesticides, including diazinon (3,634,700 TWPE). Facility contact believes that diazinon and malathion were incorrectly reported on Form Rs for 2004 and 2005. Contact believes these wastes went to the injection facility, but their manifests were labeled improperly. Form 2c of the NPDES Permit Application (submitted by facility) indicates that the facility did not sample for pesticides. Facility stopped receiving outside waste shipments in June 2006 (Krejci, 2008b).
LNVA — North Regional Treatment Plant	Beaumont, TX	245,555	No	No	Facility does not receive pesticides from any of its clients. Facility estimates pesticide discharges based on quarterly SARA sampling data, which is non-detect for all PACs according to EPA Test Method SW846 8270C (Krejci, 2008a).
Dupont Chambers Works	Deepwater, NJ	26,129	Yes	No	Facility submitted eight or nine Form R's for pesticides for 2001 to 2004 and submitted 14 in 2005. Facility detected both endrin and heptachlor once from 2004 to 2007 (Krejci, 2008c).
CWM Chemical Services LLC	Model City, NY	9,193	Yes	No	Facility reported one pesticide to TRI which was sent to the on-site landfill. The facility has tested landfill leachate in the past and has not detected the chemical of concern. No other pesticides have been received at the facility (Krejci, 2008e).
Clean Harbors Baton Rouge LLC	Baton Rouge, LA	0 [a]	Yes	No	The facility does comprehensive pesticides sampling every six months and has never detected any pesticide above the detection limit. The facility does not currently receive any known pesticides (Krejci, 2008d).

Source: *TRIReleases2005_v2*; E-mail communication with Jesse Eastep, LNVA – North Regional Treatment Plant, Beaumont, TX (Krejci, 2008a); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc. and Rino Wong and Tony Vundick, Vopak Logistics Services, Deer Park, TX (Krejci, 2008b); E-mail communication with Scott Northey, DuPont Chambers Works, Deepwater, NJ (Krejci, 2008c); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc. and Bill Clark, Clean Harbors, Baton Rouge, LA (Krejci, 2008d); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc. and Jill Banaszak, CWM Chemical Services, Model City, NY (Krejci, 2008e).
a — Facility reports zero pounds released or transferred to surface water in the TRI.

6.4.1 Pesticide Discharges for Vopak Logistics Services — Deer Park, TX

The pesticide discharges from Vopak Logistics Services (Vopak) in Deer Park, TX, contribute approximately 6,970,000 TWPE to TRI 2004 and 6,980,000 TWPE to TRI 2005. Table 6-7 shows pesticide discharges reported to TRI from Vopak for 2002 through 2005.

Table 6-7. Pesticide Discharges from Vopak Logistics Services Reported to TRI

Pollutant	2004		2005	
	Total Pounds	TWPE	Total Pounds	TWPE
Diazinon	10,281.9	6,398,170	5,841	3,634,708
Malathion	10,283.3	575,931	5,840	327,078
Total		**6,970,000**		**3,960,000**

Source: *TRIReleases2005_v2*; *TRIReleases2004_v3*.

Based on information provided by the facility, EPA believes that Vopak is not discharging pesticides to surface water. EPA contacted Vopak as part of the 2007 and 2008 annual reviews to verify the company's estimation methodology for TRI and inquire about pesticides sampling data (MacQueen, 2007; Krejci, 2008b). EPA will correct future versions of its *TRIReleases* databases to reflect the findings that the Vopak facility is not discharging pesticides to surface water.

Vopak estimates pesticide discharges for TRI based on client-provided waste characterization reports and removal efficiency estimates for its wastewater treatment system, following TRI guidelines. Vopak has not analyzed for pesticides in its wastewater. In June 2006, Vopak stopped receiving commercial waste shipments and currently only treats wastes from the co-located Vopak Terminal facility. The Vopak Terminal facility is a storage warehouse for bulk chemical products and generates wash down water that the CWT treats. Because Vopak stopped receiving outside waste shipments at the CWT facility, the facility no longer receives pesticides. Vopak expects that they will likely not report pesticide releases to TRI in the future (Krejci, 2008b).

Furthermore, Vopak identified a possible error in how pesticide releases were reported. Vopak disposes of wastewater either by injection into a deep well or through a biological wastewater treatment train that discharges to surface water. After EPA contacts, the facility examined its estimates and found that pesticide wastes were likely sent to the deep well injection facility, not discharged to surface water. The facility concluded that pesticide discharges were mistakenly reported as surface water releases instead of deep well injections in TRI since 2004 (Krejci, 2008b).

6.4.2 Pesticides Discharges for DuPont Chambers Works — Deepwater, NJ

The pesticide discharges from the DuPont Chambers Works facility, in Deepwater, NJ, contribute approximately 918,320 TWPE (2004) and 26,160 TWPE[8] (2005) in the TRI

[8] EPA changed reported hexachlorobenzene discharges from 80,923 to 0 TWPE based on non-detect results from sampling episode.

databases. Table 6-8 shows pesticide discharges reported to TRI from the DuPont Chambers Works facility for 2002 through 2005.

Table 6-8. Pesticide Discharges from DuPont Chambers Works Reported to TRI

Pollutant	2002		2003		2004		2005	
	Total Pounds	TWPE	Total Pounds	TWPE	Total Pounds	TWPE	Total Pounds	TWPE
Atrazine	NA	NA	2,709	2,820	4,340	4,520	3,521	3,670
Chlordane	13	20,300	14	27,900	35	69,800	1	1,990
Heptachlor	1	4,090	4	34,100	9	76,800	2.4	20,500
Hexachlorobenzene	25	18,100	25	48,700	39	76,000	0 [a]	0
Total		42,500		114,000		227,000		26,100

Source: *TRIReleases2005_v2*.
a — EPA changed value based on non-detect results from sampling episode.
NA — Not applicable.

EPA contacted DuPont Chambers Works as part of the 2005 annual review regarding chlordane, heptachlor, and pendimethalin discharges (Johnston, 2005), and as part of the 2008 annual review regarding hexachlorobenzene discharges (Krejci, 2008c). Discharges of pesticide chemicals in the TRI 2004 and 2005 databases account for the majority of the total CWT Category's TWPE. DuPont Chambers Works indicated that the pesticide discharges result from the treatment of wastewater from outside facilities at the DuPont Chambers Works wastewater treatment plant (Johnston, 2005). This contact prompted EPA to reclassify the pesticide discharges from the facility as regulated by the CWT ELGs.

DuPont Chambers Works estimates pesticide discharges for TRI based on the maximum concentration in client-provided waste characterization reports and its estimated treatment removals. The facility has analyzed untreated and treated wastewater for pesticides in the following events (Krejci, 2008c):

- In 2006, DuPont Chambers Works analyzed the untreated wastewater from three delivery trucks. Hexachlorobenzene was not detected in these samples.
- In 2005, the facility analyzed wastewater at an internal monitoring point prior to tertiary treatment system. Hexachlorobenzene was not detected.

For the 2005 TRI, the facility reported 18 pounds of hexachlorobenzene based on the client-provided waste characterization reports (Krejci, 2008c). Because the only sampling event for hexachlorobenzene in 2005 returned a non-detect result, EPA corrected the *TRIReleases2005_v02* database, denoting the hexachlorobenzene release as zero pounds per year.

Based on information provided by the facility, EPA believes that DuPont Chambers Works is overestimating the pesticide releases it reported to TRI. In calculating these releases, DuPont Chambers Works assumes that pesticides are present in its influent at the maximum possible concentration, and that some fraction of the pesticide waste is discharged (based on destruction efficiencies). According to DMR data for reporting years 2004 to 2007 (available through the New Jersey Department of Environmental Protection [NJ DEP] Web-site), the facility has detected both endrin and heptachlor in its wastewater at least once (NJDMR, 2008). The facility had not detected any of the other pesticides it reports to TRI (chlordane, pendamethalin, and hexachlorobenzene) from 2004 through 2007. Table 6-9 shows EPA's estimates of annual loads based on sampling data from DMRs that DuPont Chambers Works submitted to NJ DEP. Based on the annual loads calculated using the sampling data, EPA estimates discharges of zero TWPE for chlordane and hexachlorobenzene and 508 TWPE for heptachlor. For future versions of the *TRIReleases* databases, EPA will consider these data and may make additional database changes to accurately reflect the DuPont Chambers Works discharges.

Table 6-9. Estimates of Pesticide Discharges from DuPont Chambers Works Based on Sampling Data

Pollutant	Total Pounds Reported to TRI	TWPE	Conc. Range in Residual Sludge (mg/kg)	Annual Load (lb/yr) [a]			Revised TWPE [b]
				Assuming Conc. BDL Is 0	Assuming Conc. BDL Is ½ DL	Assuming Conc. BDL Is DL	
Atrazine [c]	3,521	3,670	NR	NA	NA	NA	3,670
Chlordane	1	1,990	<0.00035 — <1.6	0.000	0.332	0.665	0
Heptachlor	2.4	20,500	<.000010 — 0.159	0.046	0.060	0.073	508
Hexachlorobenzene	0	0	<0.38 — <0.84	0.000	0.038	0.762	0

Source: *TRIReleases2005_v2*; Discharge Monitoring Report Data for DuPont Chambers Works, Deepwater, NJ downloaded from the NJ DMR data system (NJDMR, 2008).
a — EPA used the quarterly pesticide residual sludge load (mg/kg) and the total suspended solids load (kg/day) to determine the annual pesticide load.
b — Revised TWPE uses EPA's methodology. When all the concentrations are reported below the detection limit the annual pounds are zero. When one or more concentrations are above the detection limit the annual pounds assume the concentration is half the detection limit for the non-detect concentrations.
c — EPA has not estimated the revised TWPE for atrazine due to a lack of sampling data.
BDL — Below detection limit.
Conc. — Concentration.
DL — Detection limit.
NR — Not reported.

6.5 CWT Category Polycyclic Aromatic Compounds Discharges

After pesticide chemicals, PACs are the largest contributor to the TWPE discharges from TRI 2004 and 2005 for the CWT Category. The PAC discharges are reported by one facility, LNVA North Regional Treatment Plant (LNVA) in Beaumont, TX. Table 6-10 shows PAC discharges reported to TRI from LNVA for 2004 through 2005. No PAC discharges were reported from this facility prior to 2004.

Table 6-10. PAC Discharges from LNVA North Regional Treatment Plant Reported to TRI

Pollutants	2004		2005	
	Total Pounds	TWPE	Total Pounds	TWPE
PACs	2,600	261,176	2,400	241,584

Source: *TRIReleases2005_v2*; *TRIReleases2004_v3*.

EPA contacted LNVA in 2005 regarding the facility's PAC discharges. LNVA treats industrial waste from the ExxonMobil refinery and chemical plant, PD Glycol, Peak Sulfur, and Elf Atochem. The facility stated that it had never detected any PACs above detection limits in its wastewater and that it currently uses half the detection limit multiplied by total plant flow for TRI reporting (Wolford, 2005). EPA contacted LNVA again in 2008; the facility reported that it had still not detected any PACs in its effluent above the method detection limit for EPA Method SW846 8270C (Krejci, 2008). In future versions of the TRI database, EPA will correct the discharges of PACs from this facility to denote zero pounds per year.

6.6 <u>CWT Category Conclusions</u>

During the 2008 Annual Review, EPA used information gathered from TRI and PCS databases and facility contacts to conclude that no further review of discharges from CWTs is necessary at this time. The conclusions of the CWT Category review are as follows:

- TRI-reported discharges of pesticides account for the majority of the CWT Category's TWPE. EPA determined that pesticide releases from the CWT facilities contributing significant portions of the category TWPE (Vopak and DuPont Chambers Works) are estimated using waste characterization reports from clients and treatment efficiencies, rather than actual sampling data.
- Only one CWT facility that EPA contacted detected pesticides in its discharges: DuPont Chambers Works, which detected endrin and heptachlor at least once in its effluent between 2004 and 2007. Based on the information collected from DuPont Chambers Works, the amount of pesticides discharged to surface water is less than the amounts reported to TRI. Instead of the 26,129 TWPE[9] for TRI 2005, EPA believes the actual pesticide discharges from DuPont Chambers Works were approximately 4,178 TWPE.
- TRI-reported discharges of PACs are the third highest ranking pollutant in terms of TWPE in the TRI 2004 and 2005 databases, which all result from reports by one CWT facility, LNVA. LNVA estimates PAC discharges based on half the detection limit multiplied by the flow. The facility has never detected PACs in its discharges above the detection limit. In future versions of the *TRIReleases* databases, EPA will correct the TRI databases, denoting the discharge as zero pounds per year.
- EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as toxic-weighted equivalents (or TWPE). Based on the above conclusions, EPA is assigning this category a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the accompanying Federal Register notice that presents the 2008 annual review of effluent guidelines and pretreatment standards).

[9] EPA changed reported DuPont Chambers Works hexachlorobenzene discharges from 80,923 to 0 TWPE based on non-detect results from sampling episode in *TRIReleases2005*. This TWPE includes the revisions to the hexachlorobenzene.

6.7 CWT Category References

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Table 6-11. Pesticides Treatability Data

Pesticide	Structural Group	Pesticide Mfr BAT Technology	Hydrolysis Half-Life (Min.) or % Rem.	Source	Carbon Saturation Loading (g/g) or % Rem.	Source	Chemical Oxidation % Rem.	Source
Atrazine	S-Triazine	HD, BO	65.5% (b,d)	EPA Sampling	86.2% (d)	Other	14.80%	EPA Sampling
			4800 (b)	Other	0.2159 (e)	Other		
			17,700 (b)	Other	0.04 (c)	EPA Bench Study		
			2760 (b)	EPA Bench Study	99.99% (d)	EPA Sampling		
			731	Extrapolated	0.168 (d)	EPA Bench Study		
					0.014, 0.13 (g)	EPA Bench Study		
Chlordane	Tricyclic	NM86	>5,000,000 (b)	Other	99.9% (c)	Other		
					>99.5%	Other		
					0.25,0.38 (g)	Other		
					0.065	Other		
Diazinon	Phosphorothioate	AC	5	EPA Bench Study	95.2% (d)	EPA Sampling		
			706 (b)	Other	93.2% (d)	EPA Sampling		
			706 (b)	EPA Bench Study	0.14,0.49 (g)	EPA Bench Study		
					0.147 (c)	EPA Bench Study		
					84.8% (d)	EPA Sampling		
Heptachlor	Tricyclic	RA	1400 (b)	Other	1.22, 0.95 (g)	Other	65%	EPA Bench Study
					0.014	Other		
					>70%	EPA Bench Study		
					>99.5%	Other		
Haxachlorobenzene [a]	Lindane	AC	300,000 (b)	Other	0.26,0.49 (g)	Other		
					>99.5% (f)	Other		
					>99%	Other		
					0.0195 (c)	Other		

Table 6-11. Pesticides Treatability Data

Pesticide	Structural Group	Pesticide Mfr BAT Technology	Hydrolysis Half-Life (Min.) or % Rem.	Source	Carbon Saturation Loading (g/g) or % Rem.	Source	Chemical Oxidation % Rem.	Source
					0.257	Other		
					0.025	Other		
Malathion	Phosphorodithioate	HD	60 (b)	EPA Bench Study	>98.8% (f)	Graph		
			<30	EPA Bench Study	>98.3% (d)	EPA Sampling		
					99.90%	Other		
					0.26, 0.22 (g)	EPA Bench Study		
					87.5% (f)	Other		
Toxaphene	Bicyclic	AC	5,000,000 (b)	Other	0.0034,0.399 (g)	90th		
					0.042	**Other**		

Source: Draft Pesticides Formulators, Packagers, and Repackagers Treatability Database Report (U.S. EPA, 1994).
a — Transferred from Lindane based on experimental data.
b — Hydrolysis conditions other than pH 12 and 60°C
c — Data include multiple runs at varying design and operating conditions; value given is for best treatability performance
d — Data include multiple runs at similar design and operating conditions; average performance value is given.
e — Value given is for total chlorotriazine pesticides. Data for individual pesticides are not available.
f — Multiple data points from the document listed in table for the same PAI because document provided data from different sources.
g — Values given are Freundlich isotherm parameters K in grams PAI per gram carbon and 1/n (unitless).
NM86 — Not produced in United States in 1986.
RA — Rain adsorption.
AC — Activated carbon.
HD — Hydrolysis.
BO — Biological oxidation.

7.0 ORGANIC CHEMICALS PLASTICS AND SYNTHETIC FIBERS (40 CFR PART 414)

EPA selected the OCPSF Category (40 CFR Part 414) for preliminary review because it continues to rank high, in terms of TWPE, in point source category rankings (see Tables 5-3 and 5-4 for the point source category rankings). EPA previously performed a detailed study of this industry, published as part of the 2004 Final ELG Plan (69 FR 53705). EPA has also reviewed discharges from OCPSF facilities as part of its annual reviews since 2004. Each year, including this year of review, EPA has concluded that wastewater from OCPSF facilities does not warrant a more detailed review at this time.

EPA is currently reviewing discharges from the Chlorinated Hydrocarbon Manufacturing Segment of the OCPSF Category as part of the CCH effluent guidelines rulemaking. Because a rulemaking for this segment of the OCPSF Category is underway, EPA excluded discharges from these facilities from further consideration in this review (see Table V-1, 70 FR 61335, October 30, 2007).

7.1 OCPSF Category Background

This subsection provides background on the OCPSF Category, including a brief profile of the OCPSF industry and background on 40 CFR Part 414.

7.1.1 OCPSF Industry Profile

The OCPSF Category includes many chemical industries producing a wide variety of end products, such as polypropylene, vinyl chloride and polyvinyl chloride (PVC), chlorinated solvents, rubber precursors, styrofoam additives, and polyester. Some OCPSF facilities are extremely complex and produce hundreds of chemicals, while others are simpler, producing one or two end products. Facilities in the following five SIC codes could perform operations covered by the OCPSF ELGs:

- 2821: Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers;
- 2823: Cellulosic and Other Man-Made Fibers;
- 2824: Synthetic Organic Fibers, Except Cellulose;
- 2865: Cyclic Crudes and Intermediates, and Organic Dyes and Pigments; and
- 2869: Industrial Organic Chemicals, Not Elsewhere Classified (NEC).

In addition, EPA is considering including operations from five other SIC codes as potential new subcategories of the OCPSF Category.[10]

Table 7-1 presents the number of facilities in the five SIC codes that compose the OCPSF industry. Because the U.S. Economic Census reports data by NAICS code, and TRI and PCS

[10] EPA reviews industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the SIC codes 2842, 2844, 2891, 2899, and 5169 (listed in Table 7-1) are similar to those of the OCPSF Category (U.S. EPA, 2004). The tables in this section include discharge information from the potential new subcategories; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

report data by SIC code, EPA reclassified the 2002 U.S. Economic Census by the equivalent SIC code.

OCPSF facilities discharge directly to surface water as well as to POTWs. Table 7-2 presents the types of discharges reported by facilities in the 2004 and 2005 TRI databases. The majority of facilities reporting to TRI reported no water discharges, but facilities may be discharging pollutants in wastewater at levels below the TRI-reporting thresholds.

Table 7-1. Number of Facilities in OCPSF SIC Codes

SIC	2002 U.S. Economic Census	2004 PCS [a]	2004 TRI [b]	2005 TRI [b]
2821: Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers	688	144	383	380
2823: Cellulosic and Other Man-Made Fibers	8	3	4	5
2824: Synthetic Organic Fibers, Except Cellulosic	94	10	38	35
2865: Cyclic Crudes and Intermediates, and Organic Dyes and Pigments	217	36	87	84
2869: Industrial Organic Chemicals, NEC	3,215	219	471	476
OCPSF Category Total [c]	**4,222**	**412**	**983**	**980**
Potential New Subcategories				
2842: Specialty Cleaning, Polishing, and Sanitation Preparations	604	0	137	455
2844: Perfumes, Cosmetics, and Other Toilet Preparations	1,586	11	39	138
2891: Adhesives and Sealants	585	14	174	38
2899: Chemicals and Chemical Preparations, NEC	3,582	56	329	173
5169: Chemicals and Allied Products	54,314	0	444	327
Potential New Subcategories Total	**60,671**	**81**	**1,123**	**1,131**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Major and minor dischargers.
b — Releases to any media.
c — Excludes the potential new subcategories.
NEC — Not elsewhere classified.

Table 7-2. OCPSF Category Facilities by Type of Discharge Reported in TRI 2004 and 2005

SIC Code	TRI 2004				TRI 2005			
	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
2821: Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers	62	92	18	211	65	92	16	207
2823: Cellulosic and Other Man-Made Fibers	2	0	1	1	3	0	1	1
2824: Synthetic Organic Fibers, Except Cellulosic	9	14	2	13	7	12	4	12
2865: Cyclic Crudes and Intermediates, and Organic Dyes and Pigments	19	28	4	36	18	28	5	33
2869: Industrial Organic Chemicals, NEC	106	128	26	211	106	118	28	224
OCPSF Category Total [a]	**198**	**262**	**51**	**472**	**199**	**250**	**54**	**477**
Potential New Subcategories								
2842: Specialty Cleaning, Polishing, and Sanitation Preparations	1	38	0	98	9	34	1	411
2844: Perfumes, Cosmetics, and Other Toilet Preparations	0	23	0	16	1	39	0	98
2891: Adhesives and Sealants	3	22	1	148	0	20	0	18
2899: Chemicals and Chemical Preparations, NEC	14	88	8	219	4	24	0	145
5169: Chemicals and Allied Products	8	36	1	399	15	83	9	220
Potential New Subcategories Total	**26**	**207**	**10**	**880**	**29**	**200**	**10**	**892**

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Excludes the potential new subcategories.
NEC — Not elsewhere classified.

7.1.2 40 CFR Part 414

EPA first promulgated ELGs for the OCPSF Category (40 CFR Part 414) on November 5, 1987 (52 FR 42568). This category consists of eight subcategories that apply to the manufacture of products and product groups, as shown in Table 7-3 with the corresponding SIC codes and applicability. Subparts B through H have limitations for BOD_5, TSS, and pH. The regulation also includes limitations and/or pretreatment standards for certain toxic pollutants in three additional subparts:

- Subpart I — Direct Discharge Point Sources That Use End-of-Pipe Biological Treatment;
- Subpart J — Direct Discharge Point Sources That Do Not Use End-of-Pipe Biological Treatment; and
- Subpart K — Indirect Discharge Point Sources.

Table 7-3. Applicability of Subcategories in the OCPSF Category

Subpart	Subpart Name	Applicable SIC Code(s)	Subpart Applicability
B	Rayon Fibers	2823: Cellulosic Manmade Fibers	Cellulosic manmade fiber (Rayon) manufactured by the Viscose process.
C	Other Fibers	2823: Cellulosic Manmade Fibers 2824: Synthetic Organic Fibers, Except Cellulosic	All other synthetic fibers (except Rayon) including, but not limited to, products listed in Section 414.30.
D	Thermoplastic Resins	28213: Thermoplastic Resins	Any plastic product classified as a thermoplastic resin including, but not limited to, products listed in Section 414.40.
E	Thermosetting Resins	28214: Thermosetting Resins	Any plastic product classified as a thermosetting resin including, but not limited to, products listed in Section 414.50.
F	Commodity Organic Chemicals	2865: Cyclic Crudes and Intermediates, Dyes and Organic Pigments 2869: Industrial Organic Chemicals, NEC	Commodity organic chemicals and commodity organic chemical groups including, but not limited to, products listed in Section 414.60.
G	Bulk Organic Chemicals	2865: Cyclic Crudes and Intermediates, Dyes and Organic Pigments 2869: Industrial Organic Chemicals, NEC	Bulk organic chemicals and bulk organic chemical groups including, but not limited to, products listed in Section 414.70.
H	Specialty Organic Chemicals	2865: Cyclic Crudes and Intermediates, Dyes and Organic Pigments 2869: Industrial Organic Chemicals, NEC	All other organic chemicals and organic chemical groups including, but not limited to, products listed in the OCPSF Development Document (Vol. II, Appendix II-A, Table VII).

Source: *Product and Product Group Discharges Subject to Effluent Limitations and Standards for the Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category — 40 CFR 414,* Table 2-2 (U.S. EPA, 2005).

NEC — Not elsewhere classified.

7.2 OCPSF Category 2004 Through 2008 Screening-Level Reviews

Over the years of EPA review, from 2004 through 2008, the TWPE associated with OCPSF facilities has increased. Table 7-4 shows the screening-level results for the OCPSF industry from the 2002 through 2005 TRI and PCS databases. The TRI TWPE increased significantly from 2002 to 2003 and then decreased from 2003 to 2005. However, the 2005 TRI TWPE is still more than double the TRI TWPE for 2002. The PCS TWPE has increased about 23 percent from 2002 to 2004.

Table 7-4. OCPSF Screening-Level Results

Year of Review	Year of Data Source	OCPSF Category [a]		Potential New Subcategory for the OCPSF Category [d]	
		TRI TWPE [b]	PCS TWPE [c]	TRI TWPE [b]	PCS TWPE [c]
2005	2002	349, 429	397,951	12,153	17,252
2006	2003	1,021,401	NA	4,161	NA
2007 [e]	2004	957,134	608,394	3,578	3,121
2008	2005	758,964	NA	19,215	NA

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2; PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Includes TWPE from the potential new subcategory.
b — Direct and indirect water releases only.
c — Major dischargers only.
d — EPA reviews industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the SIC codes 2842, 2844, 2891, 2899, and 5169 (listed in Table 7-1) are similar to those of the OCPSF Category (U.S. EPA, 2004). The tables in this section include discharge information from the potential new subcategories; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.
e — EPA corrected the PCS TWPE during the 2008 annual review because EPA determined that hexachlorobenzene (HCB) loads were linked to the incorrect pollutant TWF in *PCSLoads2004_v3*. As a result, the OCPSF Category TWPE increased from 490,000 to 608,000 lb-eq/yr from the 2007 annual review to the 2008 annual review.
NA — Not applicable. EPA did not evaluate PCS data for 2003 and 2005.

7.3 OCPSF Category 2004 Through 2008 Pollutants of Concern

Table 7-5 shows the five pollutants with the highest TWPE in *TRIReleases2004*, *TRIReleases2005*, and *PCSLoads2004*. For comparison purposes, Table 7-6 provides similar information from the 2006 Final ELG Plan (71 FR 76644) using *TRIReleases2002*, *TRIReleases2003*, and *PCSLoads2002*.

Table 7-5. 2008 Review: OCPSF Category Pollutants of Concern [a]

Pollutant	PCS 2004 [b]			TRI 2004 [c]			TRI 2005 [c]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Hexachlorobezene [d]	13	62.9	122,529	4	43	84,480	Pollutants are not in the top five TRI 2005 reported pollutants.		
Aluminum	20	3,233,568	209,183	Pollutants are not in the top five TRI 2004 reported pollutants.					
Benzidine	1	23	63,844						
Chlorine	46	74,952	38,162	21	45,018	22,921	20	59,391	30,240
Fluoride	12	806,793	28,238	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Dioxin and Dioxin-Like Compounds	Pollutants are not in the top five PCS 2004 reported pollutants.			8	0.527	693,358	7	0.388	503,240
Hydroquinone				6	13,383	17,051	Pollutants are not in the top five TRI 2005 reported pollutants.		
Nitrate Compounds				130	21,719,795	16,217	128	26,662,576	19,908
PACs				Pollutants are not in the top five TRI 2004 reported pollutants.			10	463	46,620
Acrylonitrile							28	8,491	19,353
OCPSF Category Total	**228** [e]	**3,800,000,000**	**608,000**	**754** [e]	**35,300,000**	**957,000**	**68** [e]	**35,400,000**	**759,000**

Source: *PCSLoads2004_v4; TRIReleases2004_v3; TRIReleases2005_v2*.

a — This table presents the top five pollutants composing the category TWPE, including the potential new subcategory SIC codes. However, the potential new subcategories contribute negligible pounds and TWPE.

b — Discharges include only major dischargers.

c — Discharges include transfers to POTWs and account for POTW removals.

d — EPA corrected the PCS TWPE during the 2008 annual review because EPA determined that hexachlorobenzene (HCB) loads were linked to the incorrect pollutant TWF in *PCSLoads2004_v3*. As a result, the OCPSF Category TWPE increased from 490,000 to 608,000 lb-eq/yr from the 2007 annual review to the 2008 annual review.

e — Number of facilities reporting TWPE greater than zero.

PACs — Polycyclic aromatic compounds.

Table 7-6. 2006 Review: OCPSF Category Pollutants of Concern [a]

Pollutant	PCS 2002 [b]			TRI 2002 [c]			TRI 2003 [c]		
	Number of Facilities Reporting Pollutant	**Total Pounds**	**TWPE**	**Number of Facilities Reporting Pollutant**	**Total Pounds**	**TWPE**	**Number of Facilities Reporting Pollutant**	**Total Pounds**	**TWPE**
Hexachlorobenzene	13	53	103,420	4	30	59,272	4	32	61,656
Chlorine	58	106,278	54,113	25	56,954	28,999	22	55,810	28,416
Fluoride	14	910,270	31,859	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Benzo(a)pyrene	16	288	28,990						
Copper	100	33,629	21,348						
Dioxin and Dioxin-like Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			8	0.019	115,132	6	0.440	703,572
Nitrate Compounds				131	44,533,702	33,252	Pollutants are not in the top five TRI 2003 reported pollutants.		
Hydroquinone				6	13,513	17,217			
PACs				Pollutants are not in the top five TRI 2002 reported pollutants.			10	675	67,964
PCBs							2	0.812	27,627
OCPSF Category Total	**232 [d]**	**978,243,371**	**397,951**	**791 [d]**	**53,973,135**	**349,429**	**762 [d]**	**37,904,315**	**1,021,401**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
a — This table presents the top five pollutants composing the category TWPE, including the potential new subcategory SIC codes. However, the potential new subcategories contribute negligible pounds and TWPE.
b — Discharges include only major dischargers.
c — Discharges include transfers to POTWs and account for POTW removals.
d — Number of facilities reporting TWPE greater than zero.
PACs — Polycyclic aromatic compounds.
PCBs — Polychlorinated biphenyls.

EPA identified the OCPSF pollutants of concern based on relative TWPE. Dioxin and dioxin-like compounds have the highest TWPE in the TRI databases from 2002 to 2005, contributing more than 65 percent of the total category TWPE for both 2004 and 2005. The TRI-reported discharges of hexachlorobenzene (HCB) decreased from 2004 to 2005; in 2005, HCB was no longer a top pollutant in terms of TWPE. However, the TRI-reported discharges of PACs increased from 2004 to 2005 in TRI. For PCS, HCB is the top pollutant discharged in terms of TWPE in 2002 and 2004. Other top pollutants in 2004 are aluminum and benzidine. Aluminum and benzidine were not listed top pollutants in 2002. EPA performed additional review for the pollutants of concern:

- Dioxin and dioxin-like compounds from TRI (Section 7.8);
- PACs from TRI (Section 7.9);
- HCB from TRI and PCS (Section 7.10);
- Aluminum from PCS (Section 7.11); and
- Benzidine from PCS (Section 7.12).

EPA did not perform additional review of other top TRI pollutants because their relative contributions in the 2004 and 2005 databases account for less than 34 percent of the combined OCPSF Category TWPE. EPA did not perform additional review of the other top PCS pollutants because TRI TWPE dominates the PCS TWPE for the OCPSF Category.

7.4 OCPSF Category Dioxin and Dioxin-Like Discharges in TRI

EPA has reviewed discharges of dioxin and dioxin-like compounds each year for the OCPSF Category since 2004. For the 2008 annual review, EPA reviewed information about facilities that reported discharges of dioxin and dioxin-like compounds to TRI to determine potential process sources and methods used to estimate reported discharges. The results of the 2008 annual review show that dioxin and dioxin-like compounds continue to rank high in terms of TRI TWPE. PCS dioxin and dioxin-like compounds TWPE, however, has decreased significantly from the 2005 annual review.

Table 7-7 shows the OCPSF facilities that reported discharges of dioxin and dioxin-like compounds to TRI from 2002 to 2005 and how the facilities estimated discharges of dioxin and dioxin-like compounds (based on contact with the facilities) (ERG, 2006). One facility, BP Solvay Polyethylene in Deer Park, TX contributes more than 95 percent of the total dioxin and dioxin-like compound TRI TWPE for the OCSPF Category from 2003 to 2005. In addition to the facilities presented in Table 7-7, EPA identified two new facilities reporting wastewater releases of dioxin and dioxin-like compounds for 2004 and 2005:

- CIBA Specialty Chemicals Corp, St. Gabriel, LA; and
- Nation Ford Chemical Co, Fort Mill, SC.

Combined, these two facilities contribute less than 200 TWPE (<0.05 percent) of the OCPSF Category total TWPE for dioxin and dioxin-like compounds. Therefore, EPA did not contact these facilities to gather information on their basis of estimate or process sources of dioxin and dioxin-like compounds for the 2008 annual review.

Table 7-7. OCPSF Facilities Reporting Dioxin Releases to TRI

Facility Name (Facility Location)	TRI 2002 Dioxin TWPE	TRI 2003 Dioxin TWPE	TRI 2004 Dioxin TWPE	TRI 2005 Dioxin TWPE	Basis of Estimate	Was Dioxin Detected?	Findings
Atofina (Total) Petrochemicals Inc. (La Porte, TX)	57,489	799	799	799	TCEQ sampling episode in 1999	TCEQ detected 1,2,3,4,6,7,8-HpCDD, OCDD, and OCDF (TCEQ, 2003)	TCEQ sampled at the final outfall for the facility's NPDES permit and provided one concentration that represented a mixture of dioxin congeners. Facility multiplies this concentration by the total wastewater flow for the outfall. Facility continues to use the TCEQ dioxin number every year for their TRI reports.
BP Solvay Polyethylene N.A. (Innovene) (Deer Park, TX)	NR	678,344	657,253	480,414	TCEQ sampling episode in 2002	TCEQ detected 1,2,3,4,6,7,8-HpCDD, OCDD, and 1,2,3,4,7,8-HxCDF (TCEQ, 2003)	TCEQ sampled at the final outfall for the facility's NPDES permit and provided one concentration that represented a mixture of dioxin congeners. Facility multiplies this concentration by the total wastewater flow for the outfall. Facility continues to use the TCEQ dioxin number every year for their TRI reports.
Celanese Acetate Celco Plant (Narrows, VA)	941	NR	NR	NR	Worst-case scenario engineering estimate	No	Facility uses dissolving-grade wood pulp as a raw material. Celanese had reviewed a study that looked at the dioxin content of wood pulp and its potential to end up in stormwater. Wastewater monitoring data for Celanese's Form 2C application shows all nondetects for dioxin. Celanese stopped reporting water releases of dioxin to TRI in 2004.
Cytec Industries Inc. (Wallingford, CT)	13,460	5,982	8,973	NR	Engineering estimate	Not monitored	Dioxin water release was based on an engineering estimate for the operation of an incinerator that was used to dry out biosolids. This incinerator is no longer in operation and site did not report dioxin to TRI for 2005.
Dow Chemical Co. Midland Ops. (Midland, MI)	25,502	NR	6,542	6,852	Routine monitoring conducted by facility	Yes — Reported all congeners except 1,2,3,6,7,8-HxCDF, and 1,2,3,6,7,8-HxCDD to TRI for 2002/2003.	Dioxin sources include historical process and waste management units no longer in operation at the site. A very small amount may also come from an on-site incinerator. The TRI dioxin water release is a TM 17 value that sums the average congener concentrations from samples collected throughout the year. Dow uses EPA Method 1613B to analyze for dioxin and sets all concentrations that are below the detection limit to zero.
DuPont Chambers Works (Deepwater, NJ)	334	0.580	NR	NR	Engineering estimate	Not monitored	A contaminated ferric chloride additive used for solids settling in the wastewater treatment plant was the dioxin source. Du Pont used information from the vendor on the dioxin composition of the contaminated ferric chloride to estimate their TRI releases. The site has since stopped using ferric chloride for settling. The dioxin release included in the TRI 2004 database will be zero.

Table 7-7. OCPSF Facilities Reporting Dioxin Releases to TRI

Facility Name (Facility Location)	TRI 2002 Dioxin TWPE	TRI 2003 Dioxin TWPE	TRI 2004 Dioxin TWPE	TRI 2005 Dioxin TWPE	Basis of Estimate	Was Dioxin Detected?	Findings
Lyondell Chemical Co. (Westlake, LA)	219	NR	NR	NR	Routine monitoring conducted by facility	Yes – Did not report a distribution to TRI for 2002.	A small amount of dioxin is produced by an on-site hazardous waste incinerator scrubber. The bulk of the dioxin enters the plant with the source water from the Sabine River. The site monitors the intake and final effluent for dioxin, then calculates a balance to report what is discharged. The balance is reported to TRI.
Sasol N.A. Inc. (Baltimore, MD)	3.26	NR	NR	NR	Routine monitoring conducted by facility	Yes – Reported 1,2,3,4,6,7,8-HpCDD and OCDD to TRI for 2002.	Facility formerly operated a chlorination process that generated dioxin. They began sampling process wastewater and final effluent in 2001 and detected trace amounts of OCDD. The dioxin release reported to TRI was based on this single detected congener (concentration was just above the detection limit). The site stopped monitoring for dioxin in 2003 when the chlorination process was shut down. They no longer report dioxin water releases to TRI.
Sasol N.A. Inc. Lake Charles Chemical Complex (Westlake, LA)	17,183	4,479	4,479	4,479	Sampling results from studies conducted over the years	Yes — Reported 17 congeners to TRI for 2002/2003.	Facility receives wastewater from the Georgia Gulf Lake Charles VCM plant. The VCM process wastewater is the source of dioxin.
Shell Chemical Co. Deer Park (Deer Park, TX)	NR	13,967	15,152	10,529	TCEQ sampling episode in 2003	TCEQ detected 10 dioxin congeners (TCEQ, 2003)	TCEQ sampled at the outfall for the facility's chemical plant and provided dioxin congener concentration data for 17 dioxin congeners. Facility multiplies this concentration by the total wastewater flow for the outfall. Facility continues to use the TCEQ dioxin number every year for their TRI reports. Facility treats wastewater for an OxyVinyls EDC/VCM plant, which is a large source of dioxins in their wastewater. Facility has also identified other process sources that are small contributors of dioxin.
OCPSF Category Total	**115,132**	**703,572**	**693,358**	**503,240**			

Source: *TRIReleases2002_v4*; *TRIReleases2003_v2*; *Telephone conversations with various OCPSF facility representatives and Meghan Kandle of Eastern Research Group, Inc.* (ERG, 2006).
NR – Not reported.
TCEQ – Texas Commission on Environmental Quality.
TM-17 – Total mass of 17 dioxin and dioxin-like congeners.
EDC – Ethylene dichloride.
VCM – Vinyl chlorine monomer.

According to Texas Commission on Environmental Quality (TCEQ) sampling at three facilities, dioxin and dioxin-like compound discharges contribute 99 percent of the dioxin and dioxin-like compounds TWPE for 2002. TCEQ conducted the sampling to support the total maximum daily load (TMDL) study for the Houston Ship Channel, which was placed on the Section 303(d) list after the Texas Department of Health issued a seafood consumption advisory for catfish and blue crabs in the upper portion of the Galveston Bay and Houston Ship Channel in September 1990. The purpose of the study is to develop a TMDL for dioxin in the Houston Ship Channel, including upper Galveston Bay, and to develop a plan for managing dioxin and dioxin-like compounds to correct existing water quality impairments and maintain good water quality. TCEQ analyzed effluent from the following facilities for dioxin and dioxin-like compounds: Albermarle, Atofina, Beechnut MUD, BP Solvay, Clean Harbors, Dow DP, DuPont, Equistar, Exxon, GB Biosciences, Newport MUD, OxyVinyls Battleground, OxyVinyls Deer Park, OxyVinyls La Porte, Rohm & Haas, Shell Chemical, Shell Refinery, Valero, Vopak, and several POTWs.

From 1999 to 2003 TCEQ conducted sampling at the facilities' outfalls at Atofina, Shell, and BP Solvay and detected dioxin and dioxin-like compounds. The facilities use the dioxin congener concentrations measured by TCEQ to estimate the releases of dioxin and dioxin-like compounds that they report to TRI. Each facility updates its TRI releases each year by multiplying the same dioxin concentration by the facility's annual flow. Therefore, increases in TRI-reported releases of dioxin and dioxin-like compounds from year to year reflect increases in wastewater flow and not necessarily increases in dioxin discharges.

Based on the information in Table 7-7, EPA identified the following sources of dioxin in OCPSF wastewater:

- *Historical Processes.* Three facilities, Cytec Industries, Dow Chemical, and Sasol Baltimore, MD, reported dioxin to TRI based on processes that are no longer in operation. Sasol Baltimore has not reported discharges of dioxin and dioxin-like compounds to TRI since 2002.
- *Raw Materials.* Two facilities, DuPont Chambers Works and Celanese Acetate, estimated discharges of dioxin and dioxin-like compounds based on contamination of raw materials. Celanese's estimate was based on theoretical contamination of wood pulp, and DuPont's estimate was based on actual contamination of ferric chloride. Celanese stopped reporting discharges of dioxin and dioxin-like compounds to TRI in 2003, and DuPont stopped reporting dioxin and dioxin-like compounds to TRI in 2004 (U.S. EPA, 2006).
- *Vinyl Chloride Wastewater.* Two facilities, Sasol Lake Charles, LA and Shell Deer Park, TX, treat wastewater from nearby vinyl chloride monomer plants, which are the major source of the dioxin and dioxin-like compounds that the facility reports to TRI. EPA is reviewing production of vinyl chloride monomer as part of the CCH rulemaking effort.
- *Wet Air Pollution Controls.* One facility, Lyondell, stated that an onsite incinerator is the source of dioxin and dioxin-like compounds that was reported to TRI for 2002. The facility stated that the amount of dioxin and dioxin-like compounds discharged by the incinerator scrubber is small (only 219 TWPE in Table 7-7). Lyondell has not reported discharges of dioxin and dioxin-like compounds to TRI since 2002 (U.S. EPA, 2006).

- *No Process Source Identified.* Facility contacts at Atofina and BP Solvay could not identify a potential process source for the dioxin and dioxin-like compounds that TCEQ detected at their outfalls.

7.5 OCPSF Category Hexachlorobenzene Discharges in TRI and PCS

EPA reviewed TRI and PCS data on HCB discharges from OCPSF facilities for the 2008 annual review: four facilities in TRI and 14 facilities in PCS. Tables 7-8 and 7-9 list the HCB data for the TRI (2004 and 2005) and PCS (2002 and 2004) databases.

Table 7-8 presents the facilities that reported wastewater releases of HCB to TRI for 2004 or 2005. HCB discharges ranked second in terms of 2004 TRI TWPE for the OCPSF Category. One facility, DuPont Chambers Works, contributed 90 percent of the total HCB TWPE for the OCSPF Category. EPA contacted the facility and determined that the HCB discharges were from CWT operations at the plant. Therefore, EPA categorized DuPont Chambers Works' HCB discharges in the CWT Category. As a result, HCB discharges decreased 98 percent from 2004 to 2005. Based on TRI data, HCB is not discharged at significant TWPE as a result of OCPSF operations.

Table 7-8. OCPSF Facilities Reporting HCB Releases to TRI

Facility Name	Location	2004		2005	
		Total Pounds Released [a]	TWPE	Total Pounds Released [a]	TWPE
Clariant Lsm Florida Inc	Gainesville, FL	0.0157	30.6	NR	NR
DuPont Chambers Works	Deepwater, NJ	39.0	75,961	NR	NR
Solutia Inc Delaware River Plant	Bridgeport, NJ	4.00	7,791	0.500	974
Sun Chemical Corp.	Cincinnati, OH	0.358	697	0.371	722
Total		**43.4**	**84,480**	**0.871**	**1,696**

Source: *TRIReleases2002_v4*; *TRIReleases2003_v2*.
a — Discharges include transfers to POTWs and account for POTW removals.

Table 7-9 shows the OCPSF facilities with HCB discharges in PCS for 2002 or 2004. The HCB TWPE is evenly distributed across facilities in the 2002 PCS database for the OCPSF Category. In the 2004 PCS database, DuPont de Nemours, Carneys Point, NJ, accounts for 60 percent of the HCB TWPE for the OCPSF Category.

EPA reviewed monthly DMR data for 2002 and 2004 and calculated the average detected HCB concentration for each facility. Based on this review, EPA believes that HCB loads in PCS may be calculated from concentrations that are below the detection limit. According to EPA Method 1625, the method detection limit for HCB is 10 µg/L. Concentrations for HCB range from 0.04 to 12, and all but one are less than or equal to the method detection limit.

Table 7-9. OCPSF Facilities Reporting Discharges of HCB to PCS in 2002 or 2004

NPDES ID	Facility Name	Facility Location	Average 2002 HCB Concentration (μg/L)	2002 Pounds of HCB Discharged	2002 HCB TWPE	Average 2004 HCB Concentration (μg/L)	2004 Pounds of HCB Discharged	2004 HCB TWPE
NJ0005100	E I Dupont De Nemours & Co	Carneys Point	NR	NR	NR	0.670 [a]	38	74,728
WV0000868	Flexsys America LP	Nitro	2.5	10	19,537	2.50	7.51	14,620
WV0002496	Ripplewood Phosphorus U.S. LLC	Gallipolis Ferry	4.13 [a]	7.2	14,024	5.00	7.20	14,024
WV0001112	Sunoco, Inc. (R & M)	Kenova	10	5.4	10,518	5.00	3.60	7,012
DE0020001	Metachem Products, LLC [b]	Delaware City	3.18	3.25	6,335	10.0	1.68	3,272
NJ0005045	FERRO CORP	Logan Twp	NR	NR	NR	0.683 [a]	1.67	3,246
AL0002097	Honeywell International Inc	Fairfield	4.01 [a]	0.5	982	12.7 [a]	1.08	2,104
PA0012769	Rohm and Haas Company	Bristol Boro	NR	NR	NR	0.800	0.920	1,791
WV0004740	Crompton Corporation	Morgantown	0.55	0.36	701	0.550	0.540	1,052
WV0022047	Crompton Corporation	Morgantown	0.55	0.036	70.1	0.500	0.180	351
FL0002313	Air Prod & Chem Escam Pensacol	Santa Rosa County	NR	NR	NR	NC	0.0900	175
WV0000841	GE Plastics	Washington	NR	NR	NR	0.00750	0.0540	105
WV0004588	Koppers Industries Inc	Follansbee	0.5	0.36	701	0.050	0.0257	50
LA0038890	Nalco Company	Garyville	4.75 [a]	6.48	12,621	NR	NR	NR
SC0002798	Invista S.A.R.L./Spartanburg	Spartanburg	10	7.95	15,493	NR	NR	NR
SC0003557	Honeywell Nylon LLC/ Columbia	Columbia	5.00 [a]	8.28	16,127	NR	NR	NR
WV0001279	E I Dupont De Nemours & Co	Parkersburg	0.04	2.88	5,609	NR	NR	NR
WV0005169	Bayer Materialscience, LLC	New Martinsville	0.05	0.36	701	NR	NR	NR
OCPSF Category Total				**53.1**	**103,420**		**63**	**122,529**

a — Concentration was back-calculated using monthly mass and flow data.

b — Facility is no longer active.

NR — Not Reported. HCB discharges were not included in PCS for the reporting year.

NC — Not Calculated. No flow information was included in PCS to back calculate the concentration.

7.6 OCPSF Category Polycyclic Aromatic Compounds Discharges in TRI

EPA has reviewed wastewater releases of PACs as part of the OCSPF Category since 2004, with the exception of the 2007 annual review because of TWPE in the TRI databases. PACs were not identified as a pollutant of concern during the 2007 annual review based on the 2004 TRI and PCS databases. Table 7-10 lists the OCPSF facilities that reported discharges of PACs to TRI from 2002 to 2005.

In 2004, EPA reviewed the coal tar refining sector of the OCPSF Category based on discharges of PACs reported to TRI for 2000. EPA identified three U.S. coal tar refining companies (10 facilities) operating in 2000: Honeywell International, Inc., Koppers Industries, Inc., and Reilly Industries, Inc. Seven of these facilities continue to report discharges of PACs to TRI and are listed in Table 7-10. Since 2000, Honeywell, Inc. has closed all three of its coal tar refining operations, and Reilly Tar & Chemical Company has closed its Cleveland, OH facility. As of 2004, six facilities owned by two companies continued to refine coal tar in the United States. EPA's review of the coal tar industry concluded that the industry was declining, and that the PAC discharges were at concentrations near or at treatable levels. As a result, EPA determined that, based on the information available in 2004, it was not appropriate to select coal tar refining sector of the OCPSF Category for possible effluent guidelines revision.

In addition to coal tar refiners, Table 7-10 lists five facilities that reported releases of PACs to TRI from 2002 to 2005:

- DSM Chemicals in Augusta, GA, produces caprolactam — a raw material for the production of nylon-6, cyclohexanone, ammonium sulphate for fertilizer use, and polyester resins for the powder coating industry (DSM, 2006);
- DuPont Chambers Works in Deep Water, NJ produces fluorochemicals, elastomers, and hytrel polyester elastomer (U.S. EPA, 2004);
- DuPont Washington Works in Washington, WV produces polymer products for the automotive industry including Delrin®, Crastin®, Rynite®, Zytel®, Butacite®, Dymetrol®, Hytrel® and Teflon® (DuPont, 2008);
- Neutrogena in Los Angeles, CA packages toiletries and soaps (Food & Drug Packaging, 2004); and
- Sasol NA in Baltimore, MD produces commodity and specialty chemicals for soaps, detergents and personal care products (Sasol, 2006).

DSM Chemicals in Augusta, GA, contributed more than 90 percent of the PACs TWPE for 2003, but did not report PAC discharges for 2002. The PAC discharges from DSM chemicals have decreased from 2003 to 2005. EPA contacted DSM Chemicals to discuss the basis of estimate for the 2003 TRI-reported PAC discharges (Connell, 2006). DSM confirmed that the TRI-reported discharge is based on measured concentrations of three PACs congeners: benzo(a)pyrene, dibenzo(a,h)anthracene, and indeno-1,2,3-c-pyrene. The facility samples for PACs and other priority pollutants once per year. Prior to 2003, the sampling did not include data on PACs concentrations. DSM suspects that the Number 2 fuel oil used at the site is the source of PACs in their wastewater.

The large increase in PAC releases from 2004 to 2005 results from increased releases reported by DuPont Chambers Works and new releases reported by DuPont Washington Works.

Combined, these facilities contribute more than 80 percent of the 2005 PACs TWPE for the OCPSF Category (but less than 5 percent of the OCPSF Category's total TWPE). EPA obtained 2006 TRI data to review the trends in PAC discharges from the two DuPont facilities. EPA found that DuPont Chambers Works' PAC releases decrease by 87 percent and DuPont Washington Works' PAC releases decreased by 52 percent from 2005 to 2006. EPA will continue to monitor increased reports of PAC discharges from these and other OCPSF facilities, but EPA concludes that no further review is warranted at this time.

Table 7-10. OCPSF Facilities Reporting PAC Releases to TRI

Facility Name	Facility Location	2002 PAC TWPE [a]	2003 PAC TWPE [a]	2004 PAC TWPE [a]	2005 PAC TWPE [a]
DSM Chemicals North America Inc.	Augusta, GA	NR	61,503	3,359	3,331
DuPont Chambers Works	Deepwater, NJ	1,510	3,221	6,100	17,414
DuPont Washington Works	Washington, WV	NR	NR	NR	20,233
Honeywell International, Inc. [b]	*Birmingham, AL*	*604*	*604*	*101*	*40*
Honeywell International, Inc. [b]	*Ironton, OH*	*705*	*NR*	*NR*	*NR*
Koppers Inc. [b]	Cicero, IL	4.22	4.45	3.48	227
Koppers Industries, Inc. Follansbee Tar Plant [b]	Follansbee, WV	403	403	1,309	5,234
Koppers Industries, Inc. Woodward Tar Plant [b]	Dolomite, AL	1,268	2,013	NR	NR
Neutrogena Corp.	Los Angeles, CA	0.963	0.0741	0.148	0.148
Reilly Industries, Inc. [b]	Granite City, IL	119	148	148	133
Reilly Industries, Inc. [b]	Lone Star, TX	NR	37.0	7.41	7.41
Sasol N.A., Inc.	Baltimore, MD	NR	30.2	NR	NR
Total		**4,613**	**67,964**	**11,027**	**46,620**

Source: *TRIReleases2002_v4*; *TRIReleases2003_v2*.
Italics denote facilities no longer in operation.
a — Discharges include transfers to POTWs and account for POTW removals.
b — Facility is a coal tar refiner and was included in EPA's detailed study of the OCPSF Category for the 2004 Plan.
NR — Not reported. Facility did not report PAC releases for reporting year.

7.7 OCPSF Category Aluminum Discharges in PCS

Aluminum was the top PCS pollutant in terms of TWPE for the OCSPF Category based on 2004 data. EPA had not identified aluminum as a top pollutant for the OCSPF Category in previous reviews. Table 7-11 presents the facilities that reported discharges of aluminum to PCS for 2004. As shown in the table, one facility, GE Silicones LLC, contributes 98 percent of the aluminum TWPE for the OCPSF Category. EPA obtained GE Silicones' permit information to verify reporting units for total recoverable aluminum and flow. GE Silicones' permit includes only monitoring requirements for aluminum and does not have a permit limit. EPA will monitor this facility's aluminum discharges during future OCPSF Category reviews.

Table 7-11. OCPSF Facilities Reporting Aluminum to PCS

NPID	Name	City	Total Pounds	2005 TWPE
WV0000094	GE Silicones LLC	Friendly	3,183,201	205,925
AL0000205	3M Co Decatur Plant	Decatur	10,421	674
WV0022047	Crompton Corporation	Morgantown	8,850	572
SC0001783	Celanese Acetate LLC/Celriver	Rock Hill	7,467	483
TX0006033	BP Solvay Polyethylene North A	Deer Park	5,267	341
TX0005061	Goodyear Tire & Rubber Co., Th	Beaumont	4,023	260
WV0004740	Crompton Corporation	Morgantown	3,268	211
WV0000787	Cytec Industries	Willow Island	2,871	186
WV0001279	E I DuPont De Nemours & Co	Washington	2,130	138
TX0007048	Lubrizol Corporation, The	Deer Park	1,689	109
AR0035386	Eastman Chemical Company, Arka	Batesville	1,470	95.1
TX0069493	Lyondell Chemical Company	Channelview	724	46.8
SC0003581	Milliken/Dewey Plant	Inman	465	30.1
PA0000507	Eastman Chemical Resins Inc	Jefferson	435	28.2
TX0119792	Equistar Chemicals, L.P.	Deer Park	398	25.7
MI0000761	Flint Ink-Cdr-Holland	Holland	348	22.5
NY0005801	Schenectady International, Inc	Rotterdam Junction	306	19.8
TX0074276	Sunoco, Inc. (R&M)	Houston	104	6.71
NY0002470	Buffalo Color Corp	Buffalo /C/	78	5.08
WV0004588	Koppers Industries Inc	Follansbee	54.0	3.49
Total			**3,233,568**	**209,183**

Source: *PCSLoads2004_v03*.

7.8 OCPSF Category Benzidine Discharges in PCS

Benzidine discharges ranked second in terms of TWPE for PCS pollutants for the OCPSF Category. EPA reviewed the benzidine discharges and found that they were reported by one facility, Rohm & Haas, Bristol, PA. Table 7-12 presents the monthly concentration and load data for benzidine that EPA used to calculate the annual load of 23 pounds per year. As shown in the table, all reported benzidine measurements were nondetect except for March 2004. For this month, the benzidine concentration is the same as for other months that were reported as nondetects. Therefore, EPA believes that the single benzidine detect for 2004 may be a data-entry error and that the total benzidine load for 2004 should be zero.

Table 7-12. Monthly Benzidine Concentrations and Loads for Rohm & Haas, Bristol, PA

Month	Average Load (kg/day)	Maximum Load (kg/day)	Average Concentration (mg/L)	Maximum Concentration (mg/L)	Average Flow (MGD)	Maximum Flow (MGD)
1/31/2004	<0.0120	<0.0200	<0.005	<0.005	0.993	1.446
2/29/2004	<0.0179	<0.0179	<0.0054	<0.0054	0.984	1.312
3/31/2004	0.0220	0.0220	0.0055	0.0055	0.989	1.144
4/30/2004	<0.0196	<0.0196	<0.0055	<0.0055	0.94	1.148

Table 7-12. Monthly Benzidine Concentrations and Loads for Rohm & Haas, Bristol, PA

Month	Average Load (kg/day)	Maximum Load (kg/day)	Average Concentration (mg/L)	Maximum Concentration (mg/L)	Average Flow (MGD)	Maximum Flow (MGD)
5/31/2004	<0.0177	<0.0177	<0.0055	<0.0055	0.974	1.144
6/30/2004	<0.0153	<0.0153	<0.0054	<0.0054	0.93	1.147
7/31/2004	<0.0567	<0.0567	<0.013	<0.013	1.019	1.551
8/31/2004	<0.0459	<0.0459	<0.013	<0.013	0.886	1.047
9/30/2004	<0.0161	<0.0161	<0.0054	<0.0054	0.894	1.65
10/31/2004	<0.0543	<0.0543	<0.013	<0.013	0.826	1.164
11/30/2004	<0.330	<0.0330	<0.013	<0.013	0.778	1.028
12/31/2004	<0.0474	<0.0474	<0.013	<0.013	0.775	1.097

Source: *PCSLoadCalculator2004*.

7.9 OCPSF Category Conclusions

During the 2008 Annual Review, EPA did not obtain any information to change its conclusions that have previously been made regarding the wastewater discharges from the OCPSF facilities. Therefore, the conclusions of the OCPSF category review are as follows:

- The OCPSF Category was selected for detailed review because of high TWPE in the 2005, 2006, 2007, and 2008 annual reviews.
- Dioxin and dioxin-like compounds is the highest ranking pollutant in terms of TWPE in the TRI databases from 2002 to 2005. EPA contacted the facilities that reported discharges of dioxin and dioxin-like compounds in previous reviews, and maintains its findings from these reviews: none of these facilities operate a manufacturing process that is a major source of dioxin and dioxin-like compounds. Facilities that did identify a process source of dioxin and dioxin-like compounds have stopped operating the dioxin-generating process.
- Ninety percent of the HCB TWPE in *TRIReleases2004_v3* result from one facility, DuPont Chambers Works. This facility stated that the HCB discharges were related to CWT operations at the facility. EPA classified the discharges in the CWT Category. As a result, the HCB TRI TWPE decreased 98 percent from 2004 to 2005.
- HCB is the top pollutant, in terms of TWPE, in PCS for the OCPSF Category for the 2005 annual review. EPA reviewed monthly concentrations of HCB in PCS for 2004 and 2002 and found that almost all concentrations were equal to or below the method detection limit for HCB. Therefore, EPA believes that the PCS HCB loads are based on non-detects, and will follow up with any necessary corrections in future PCS databases.
- PACs also rank high in terms of TRI TWPE for the OCSPF Category. The majority of the TRI TWPE for 2005 is from two facilities. Future OCPSF category review by EPA could focus on verification of PAC releases reported to TRI, including method of estimation, effluent concentrations, and review of process sources.
- Aluminum is the top pollutant, in terms of TWPE, in *PCSLoads2004_v4*. One facility contributes 98 percent of the aluminum TWPE for 2005. EPA verified the

annual load calculation and reporting units for the aluminum discharges, and EPA will continue to monitor this facility's aluminum discharges during future OCPSF Category reviews.

- Benzidine is the second highest pollutant in *PCSLoads2004_v4* based on TWPE. The sole benzidine discharge in *PCSLoads2004_v4* is reported by one facility. EPA believes that the PCS loads are based on nondetect values and should be zero. EPA will follow up with any necessary corrections in future PCS databases.
- EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the accompanying Federal Register notice that presents the 2008 annual review of effluent guidelines and pretreatment standards).

7.10 OCPSF Category References

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8.0 ORE MINING AND DRESSING (40 CFR PART 440)

EPA selected the Ore Mining and Dressing Point Source Category (40 CFR Part 440) for preliminary review because it continues to rank high, in terms of TWPE, in point source category rankings (see Tables 5-3 and 5-4 for the point source category rankings). EPA has reviewed discharges from ore mining facilities as part of its annual reviews since 2004. Each year, EPA has concluded that there is not sufficient data available to determine whether wastewater discharges from the Ore Mining and Dressing (Ore Mining) Category warrant a detailed study. EPA plans to continue reviewing the Ore Mining Category during the 2009 Annual Review and collect additional data from state and regional contacts.

8.1 Ore Mining Category Background

This subsection provides background on the Ore Mining Category, including a brief profile of the ore mining industry and background on 40 CFR Part 440.

8.1.1 Ore Mining Industry Profile

The ore mining and dressing industry includes facilities that mine, mill, or prepare 23 separate metal ores (U.S. EPA, 2005). This industry is divided into nine SIC codes, as shown in Table 8-1. The following SIC codes are not required to report discharges to TRI:

- 1011: Iron Ores;
- 1081: Metal Mining Services; and
- 1094: Uranium-Radium-Vanadium Ores.

Because the U.S. Economic Census reports data by NAICS code, and TRI and PCS report data by SIC code, EPA reclassified the 2002 U.S. Economic Census data by equivalent SIC code. The facilities in SIC code 1081 subject to the Ore Mining ELGs do not translate directly to a NAICS code, and EPA could not determine the number of facilities in the 2002 U.S. Economic Census for SIC code 1081.

Of the almost 400 ore mines in the 2002 U.S. Economic Census, only 73 (18 percent) reported to TRI in 2005, because facilities in SIC codes 1011, 1081, and 1094 are not required to report discharges to TRI.

Of the 35 ore mines reporting wastewater discharges in TRI, only one mine (a gold mine) reported having indirect discharges. Table 8-2 presents the types of discharges reported by facilities in the 2004 and 2005 TRI databases.

Table 8-1. Number of Facilities in Ore Mining SIC Codes

SIC Code	2002 U.S. Economic Census	2004 PCS [a]	2004 TRI [b]	2005 TRI [b]
1011: Iron Ores	24	8	NR [d]	NR [d]
1021: Copper Ores	33	15	20	22
1031: Lead and Zinc Ores	22	28	11	9
1041: Gold Ores	180	25	30	28
1044: Silver Ores	11	5	3	2
1061: Ferroalloy Ores, Except Vanadium	72	6	7	5
1081: Metal Mining Services	NA [c]	NR	NR [d]	NR [d]
1094: Uranium-Radium-Vanadium Ores	17	17	NR [d]	NR [d]
1099: Miscellaneous Metal Ores, NEC	39	11	7	7
Total	**>398**	**92**	**78**	**73**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Major and minor dischargers.
b — Releases to any media.
c — Poor bridging between SIC codes and NAICS codes. Number of facilities could not be determined.
d — Facilities in this SIC code are not required to report to TRI.
NR — Not reported.
NA — Not applicable.
NEC — Not elsewhere classified.

Table 8-2. Ore Mining Category Facilities by Type of Discharge Reported in TRI 2004 and 2005

SIC Code	TRI 2004				TRI 2005			
	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
1011: Iron Ores	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]
1021: Copper Ores	5	0	0	15	6	0	0	16
1031: Lead and Zinc Ores	9	0	0	2	8	0	0	1
1041: Gold Ores	7	1	0	22	6	0	0	22
1044: Silver Ores	1	0	0	2	1	0	0	1
1061: Ferroalloy Ores, Except Vanadium	3	0	0	4	3	0	0	2
1081: Metal Mining Services	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]
1094: Uranium-Radium-Vanadium Ores	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]	NR [a]
1099: Miscellaneous Metal Ores, NEC	3	0	0	4	3	0	0	4
Total	**28**	**1**	**0**	**49**	**27**	**0**	**0**	**46**

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Facilities in this SIC code are not required to report to TRI.
NR — Not reported.
NEC — Not elsewhere classified.

8.1.2 40 CFR Part 440

EPA first promulgated ELGs for the Ore Mining Category (40 CFR Part 440) on December 3, 1982 (47 FR 54609). This category consists of 12 subcategories, as shown in Table 8-3 with the related SIC codes and descriptions of the subcategories' applicability (U.S. EPA, 1982; U.S. EPA, 1988). BAT limitations are set equal to BPT levels for priority pollutants for this category. The priority pollutants arsenic, cadmium, copper, lead, mercury, nickel, and zinc are regulated in at least one subcategory (U.S. EPA, 2005). None of the subcategories include PSES or PSNS limitations.

Table 8-3. Ore Mining Category Subcategory Applicability

Subpart	Subcategory Title	Related SIC Code(s)	Subcategory Applicability
A	Iron Ore	1011: Iron Ores	Iron ore mines and mills using physical or chemical separation or magnetic and physical separation in the Megabit Range
B	Aluminum Ore	1099: Miscellaneous Metal Ores, NEC	Bauxite mines producing aluminum ore
C	Uranium, Radium, and Vanadium Ores	1094: Uranium-Radium-Vanadium Ores	Open-pit or underground mines and mills using acid leach, alkaline leach, or combined acid and alkaline leach to produce uranium, radium, and byproduct vanadium
D	Mercury Ore	1099: Miscellaneous Metal Ores, NEC	Open-pit or underground mercury ore mines and mills using gravity separation or froth-flotation
E	Titanium Ores	1099: Miscellaneous Metal Ores, NEC	Titanium ore mines from lode deposits and mills using electrostatic, magnetic, and physical separation or flotation; dredge mines and mills for placer deposits of rutile, ilmenite, leucoxene, monazite, zircon, and other heavy metals
F	Tungsten Ore	1061: Ferroalloy Ores, Except Vanadium	Tungsten mines and mills using gravity separation or froth-flotation
G	Nickel Ore	1061: Ferroalloy Ores, Except Vanadium	Nickel ore mines and mills
H	Vanadium Ore (Mined Alone, not as By-product)	1094: Uranium-Radium-Vanadium Ores	Vanadium ore mines and mills
I	Antimony Ore	1099: Miscellaneous Metal Ores, NEC	Antimony ore mines and mills
J	Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores	1021: Copper Ores 1031: Lead and Zinc Ores 1041: Gold Ores 1044: Silver Ores 1061: Ferroalloy Ores, Except Vanadium	Copper, lead, zinc, gold, silver, and molybdenum ore open-pit or underground mines, except for placer deposits, and mills using froth-flotation and/or other separation techniques; mines and mills using dump, heap, in situ leach, or vat-leach to extract copper from ores or ore waste materials; gold or silver mills using cyanidation; except for mines and mills from the Quartz Hill Molybdenum Project in the Tongass National Forest, Alaska
K	Platinum Ore	1099: Miscellaneous Metal Ores, NEC	Platinum ore mines and mills

Table 8-3. Ore Mining Category Subcategory Applicability

Subpart	Subcategory Title	Related SIC Code(s)	Subcategory Applicability
M	Gold Placer Mine	1041: Gold Ores	Placer deposit gold ore mines, dredges, and mills using gravity separation

Source: *Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category* (U.S. EPA, 1982); *Development Document for Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category Gold Placer Mine Subcategory* (U.S. EPA, 1988).
NEC — Not elsewhere classified.

Runoff from waste rock and overburden piles is not subject to effluent guidelines unless it naturally drains (or is intentionally diverted) to a point source and combines with "mine drainage" that is otherwise subject to the effluent guidelines (65 FR 64774, October 30, 2000). These discharges are controlled by the Storm Water Multi-Sector General Permits (MSGP).[11] (See 65 FR 64746, Oct. 30, 2000, and 70 FR 72116, December 1, 2005.) The MSGP includes very general benchmark values for sampling and general requirements to develop a stormwater pollution prevention plan, but does not establish numeric limits or stormwater containment/treatment requirements. The MSGP establishes benchmark monitoring for pollutants including TSS, pH, hardness, arsenic, beryllium, cadmium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, zinc, and uranium.[12]

Commenters on previous effluent guidelines program plans have requested that EPA reverse its decision to exclude discharges from waste rock and overburden piles from the Part 440 applicability definition of "mine drainage." Specifically, commenters suggested that EPA conduct a rulemaking to address discharges from waste rock piles, overburden piles, and other sources of water pollution at mine sites that are not currently covered by Part 440. See 63 FR 47285 (September 4, 1998).

8.2 Ore Mining Category 2004 Through 2008 Screening-Level Reviews

Over the years of EPA review, from 2004 through 2008, the TWPE associated with facilities in the Ore Mining Category has increased slightly. Table 8-4 shows the screening-level results for the Ore Mining Category from the 2002 through 2005 TRI and PCS databases. Both the 2004 TRI and PCS TWPEs increased compared to previous years. Also, the 2005 TRI TWPE increased compared to 2002, but decreased compared to 2003 and 2004.

[11] Mine sites not regulated by the MSGP include: (1) sites with their stormwater discharges regulated by an individual permit; and (2) sites without any discharge of stormwater. A facility has the option of obtaining an individual permit for stormwater discharges instead of requesting coverage under the MSGP; however, in practice this is seldom done. The current MSGP expires this year, but EPA intends to reissue it. Almost all mine sites discharge stormwater (e.g., from haul roads, process areas, equipment storage areas, mine waste rock).

[12] Table G-4 of the MSGP lists what wastewaters from mining activities are covered by Part 440 and what wastewaters are to be covered by the industrial MSGP. In response to litigation from the National Mining Association, EPA revised its interpretation of applicability for wastewaters from hard rock mining operations. Under the revised interpretation, runoff from waste rock and overburden piles is not subject to effluent guidelines unless it naturally drains (or is intentionally diverted) to a point source and combines with "mine drainage" that is otherwise subject to the effluent guidelines (65 FR 64774, October 30, 2000).

Table 8-4. Ore Mining Category Screening-Level Results

Year of Review	Year of Discharge	Ore Mining Category	
		TRI TWPE [a]	PCS TWPE [b]
2005	2002	70,214	410,266
2006	2003	77,649	NA
2007	2004	88,001	580,831
2008	2005	76,673	NA

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2; PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a – Direct and indirect water releases only.
b – Major and minor dischargers.
NA – Not applicable. EPA did not evaluate PCS data for 2003 and 2005.

8.3 Ore Mining Category 2004 Through 2008 Pollutants of Concern

Table 8-5 shows the five pollutants with the highest TWPE in *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2004_v4* for the Ore Mining Category. For comparison purposes, Table 8-6 provides similar information from the 2006 Final ELG Plan (71 FR 76644) using *TRIReleases2002_v4*, *TRIReleases2003_v2*, and *PCSLoads2002_v4*.

EPA identified the ore mining pollutants of concern based on relative TWPE. Mercury is the pollutant with the highest TWPE in the PCS database from 2004, contributing more than 65 percent of the total category TWPE for 2004. Arsenic TWPE increased by more than 50 percent in *PCSLoads* and *TRIReleases* from 2002 to 2004. However, the cadmium, cyanide, and molybdenum TWPE decreased from 2002 to 2004 and 2005. The decrease in the cyanide TWPE for the Ore Mining Category between 2002 and 2004 is also the result one facility, Zortman Mining Inc. in Zortman, MT. The decreases in the cadmium and molybdenum TWPE for the Ore Mining Category between 2005 and 2006 annual reviews and the 2007 and 2008 annual reviews are also the result of one facility for each pollutant. EPA performed additional review for the pollutants of concern:

- Mercury from PCS (Section 8.4); and
- Arsenic from PCS and TRI (Section 8.5).

EPA did not perform additional review of other top pollutants because their relative contributions in the 2004 and 2005 databases account for less than 25 percent of the combined Ore Mining Category TWPE.

To evaluate pollutants of concern, EPA also reviewed ore mining PCS and TRI data for completeness. As seen in Table 1, the TRI and PCS databases contain discharge data for less than 25 percent of ore mines in the U.S. Census. EPA collected data to supplement the TRI and PCS data, estimating pollutant discharges for the portion of the ore mining industry that is not included in the PCS and TRI databases (Section 8.7).

Table 8-5. 2008 Review: Ore Mining Category Pollutants of Concern

Pollutant	PCS 2004 [a]			TRI 2004 [b]			TRI 2005 [b]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Mercury	28	3,768	441,338	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Arsenic and Arsenic Compounds	10	7,651	30,921	5	7,532	30,439	6	6,582	26,600
Cadmium and Cadmium Compounds	38	911	21,052	6	512	11,840	6	515	11,905
Lead and Lead Compounds	40	8,523	19,091	21	9,344	20,930	21	7,273	16,291
Molybdenum	4	93,117	18,757	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Silver And Silver Compounds	Pollutants are not in the top five PCS 2004 reported pollutants.			2	500	8,235	2	500	8,235
Vanadium And Vanadium Compounds				3	205,500	7,193	3	110,500	3,868
Ore Mining Category Total	**49** [c]	**2,158,293,854**	**580,831**	**29** [c]	**550,088**	**88,001**	**27** [c]	**399,163**	**76,673**

Source: *PCSLoads2004_v4; TRIReleases2004_v3; TRIReleases2005_v2*.
a — Discharges include only major dischargers.
b — Discharges include transfers to POTWs and account for POTW removals.
c — Number of facilities reporting TWPE greater than zero.

Table 8-6. 2006 Review: Ore Mining Category Pollutants of Concern

Pollutant	2002 PCS [a]			2002 TRI [b]			2003 TRI [b]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Molybdenum	4	770,329	155,174	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Cyanide	7	109,018	121,764						
Cadmium and Cadmium Compounds	26	2,360	54,556	10	848	19,603	9	642	14,878
Lead and Lead Compounds	30	10,406	23,309	25	5,526	12,378	23	5,153	11,542
Arsenic and Arsenic Compounds	11	3,143	12,701	9	3,312	13,383	8	5,882	23,770
Silver and Silver Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			2	500	8,235	2	500	8,235
Vanadium and Vanadium Compounds				3	147,310	5,156	3	240,200	8,407
Ore Mining Category Total	**50 [c]**	**702,310,349**	**410,266**	**35 [c]**	**462,061**	**70,214**	**32 [c]**	**597,196**	**77,649**

Source: *PCSLoads2002_v4; TRIReleases2002_v4; TRIReleases2003_v2.*
a — Discharges include only major dischargers.
b — Discharges include transfers to POTWs and account for POTW removals.
c — Number of facilities reporting TWPE greater than zero.

8.4 Ore Mining Category Mercury Compounds Discharges

EPA reviewed discharges of mercury in *PCSLoads2004_v4* because mercury accounts for over 75 percent of the category TWPE from that database. EPA determined that over 99 percent (441,093 TWPE) of the mercury in *PCSLoads2004_v4* results from Northshore Mining Company in Silver Bay, MN.

EPA collected additional information on this facility's discharges, including the facility's NPDES permit and available discharge information. The facility's permit does not set limits for mercury discharges, and Part 440 Subpart A (Iron Ore mines) set ELGs for only iron, total suspended solids, and pH. The permit does require that mercury be monitored in the facility's wastewater. Table 8-7 shows the mine's flow rates and mercury concentrations from *PCSLoads2004_v4*.

Table 8-7. Flow and Mercury Concentrations for Northshore Mining Company

Date	Flow (MGD)	Total Mercury Concentration (mg/L)	Permit Limit
March 31, 2004	3.26	Non-detect	Monitoring Only
June 30, 2004	3.56	Non-detect	
September 30, 2004	4.13	0.0005	
December 31, 2004	3.58	0.7	

Source: *PCSLoads200_v4*.

Northshore Mining Company mines and processes taconite (iron ore) to produce iron (Northshore Mining Company, 2006). The Minnesota Department of Natural Resources has linked the processing of taconite to elevated mercury levels in Minnesota's surface waters (MDNR, 2003). Possible sources of mercury in wastewater discharges from taconite processing include the following (U.S. EPA, 1995):

- Blowdown from wet air pollution control equipment controlling emissions from crushing and beneficiation;
- Blowdown from wet air pollution control equipment controlling emissions from induration furnaces;
- Blowdown from wet air pollution control equipment controlling emissions from the top gas stack; and
- Mine drainage.

EPA plans to contact this facility as part of the 2009 Annual Review to review the facility's mercury discharges.

8.5 Ore Mining Category Arsenic Compounds Discharges

The arsenic TWPE for the Ore Mining Category increased over the years of EPA's review in both PCS and TRI, although the TRI TWPE decreased slightly between 2004 and 2005. The increases in arsenic discharges do not result from newly reported discharges, but rather increased discharges from the same facilities.

Table 8-8 shows arsenic discharges by facility reported in *PCSLoads2002_v4* and *PCSLoads2004_v4*. In *PCSLoads2004_v4*, arsenic discharges from the Ore Mining Category are dominated by two facilities: Kennecott Utah Copper Mine in Salt Lake City, UT, and Lac Minerals (USA) Gold Mine in Lead, SD. Although eight of the 10 facilities reporting arsenic discharges to PCS during years of review are gold mining facilities, the top arsenic discharge in the Ore Mining Category comes from Kennecott Copper Mine in Salt Lake City, UT. Arsenic discharges from this facility contributed 85 and 66 percent of the category arsenic TWPE in *PCSLoads2002_v4* and *PCSLoads2004_v4*, respectively.

Table 8-9 shows arsenic discharges by facility reported to TRI from 2002 through 2005. In TRI, arsenic discharges from the Ore Mining Category are dominated by three facilities: the Newmont Lone Tree Mine in Valmy, NV, the Kennecott Utah Copper Mine in Salt Lake City, UT, and the Kennecott Utah Copper Smelter and Refinery in Magna, UT. Of the 11 facilities reporting arsenic discharges to TRI from 2002 through 2005, six are gold mining facilities.

Based on the results shown in Tables 8-8 and 8-9, EPA intends to review arsenic discharges as part of the 2009 annual review. EPA plans to review discharges from facilities with the majority of the TWPE: copper mines. EPA also plans to review gold mine arsenic discharges, because the majority of facilities with arsenic discharges are gold mines.

8.6 Ore Mining Category Facility Identification

EPA received comments on previous effluent guidelines program plans stating that discharges from facilities in the Ore Mining Category may not be adequately quantified in the PCS and TRI databases and that these discharges can significantly affect water quality (Johnston, 2003). As part of the 2007 review, EPA reviewed facility information to better understand the portion of the industry that is not included in the PCS and TRI databases.

EPA compared the facilities in the PCS and TRI databases to the USGS Mineral Yearbook to identify facilities that could be discharging but are not in EPA’s databases. Because facilities in Subparts A (Iron Ore) and J (Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores) contribute the majority of the category TWPE, EPA focused on identifying facilities in these subcategories. Table 8-14 at the end of this section lists all of the facilities that EPA identified during the 2007 category review with discharges applicable to 40 CFR Part 440. EPA identified 57 facilities that are not included in the PCS and TRI databases but are in the USGS Mineral Yearbook.

Table 8-8. 2006 Review: Arsenic Discharges in *PCSLoads2004_v4* and *PCSLoads2002_v4* from Facilities in the Ore Mining Category [a]

Type of Mine	Facility Name	Location	Maximum Arsenic Concentration in *PCSLoads2004_v4* (mg/L)	2004		2002	
				Total Pounds Released	TWPE	Total Pounds Released	TWPE
Copper	Kennecott Copper Co	Salt Lake City, UT	0.726	5,051	20,414	2,660	10,750
Gold	Lac Minerals (USA) Inc	Lead, SD	0.007	2,512	10,153	7	27
Gold	Wharf Resources (USA), Inc.	Lead, SD	0.136	41	166	113	455
Gold	Golden Reward Mining Co	Lead, SD	0.021	27	108	30	121
Gold	Homestake Mining Co-Gold Div	Lead, SD	0.011	17	70	212	856
Silver	Platoro Mining Co & Union Gold	Conejos County, CO	0.092	3	10	1	4
Gold	Zortman Mining Inc.	Zortman, MT	NR	NR	NR	76	307
Gold	Zortman Mining Inc.	Zortman, MT	NR	NR	NR	34	138
Gold	Hecla Mining Co	Stanley, ID	NR	NR	NR	9	36
Copper	Phelps Dodge Corp	Cottonwood, AZ	NR	NR	NR	2	7
Total				**7,651**	**30,921**	**3,143**	**12,700**

Source: *PCSLoads2004_v4: PCSLoads2002_v4.*
a — Includes only discharges greater than one TWPE from PCS Majors.
NR — Not reported

Table 8-9. 2006 Review: Arsenic Discharges Reported to TRI from Facilities in the Ore Mining Category [a]

Type of Mine	Facility Name	Location	2005		2004		2003		2002	
			Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE	Total Pounds Released	TWPE
Gold	Newmont Mining Corp. Lone Tree Mine	Valmy, NV	3,400	13,741	3,000	12,124	2,900	11,720	2,000	8,083
Copper	Kennecott Utah Copper Smelter & Refy.	Magna, UT	2,400	9,699	3,400	13,741	2,100	8,487	750	3,031
Copper	Kennecott Utah Copper Mine Concentrators & Power Plant	Salt Lake City, UT	750	3,031	1,100	4,445	750	3,031	250	1,010
Ferroalloy	Thompson Creek Mining Co.	Clayton, ID	15	61	15	61	15	61	15	61
Lead/Zinc	Pend Oreille	Metaline Falls, WA	12	48	NR	NR	NR	NR	NR	NR
Gold	Pogo Mine	Pogo Mine, AK	5	20	NR	NR	NR	NR	NR	NR
Lead/Zinc	Kennecott Greens Creek Mining Co.	Juneau, AK	NR	NR	NR	NR	7	28	10	40
Gold	Barrick Goldstrike Mines Inc.	Elko, NV	NR	NR	NR	NR	NR	NR	19	77
Gold	Newmont Mining Corp. Twin Creeks Mine	Golconda, NV	NR	NR	17	69	9	36	52	210
Gold	Getchell Gold Corp.	Golconda, NV	NR	NR	NR	NR	1	3	0.3	1
Gold	Homestake Mine	Lead, SD	NR	NR	NR	NR	100	404	215	869
Total			**6,582**	**26,600**	**7,532**	**30,440**	**5,882**	**23,770**	**3,312**	**13,383**

Source: *TRIReleases2005_v2: TRIRelease2004_v3; TRIReleases2003_v2;TRIReleases2002_v4.*

a — Does not include facilities reporting to SIC Codes 1011, 1081, and 1094. Facilities classified under these SIC codes are not required to report to TRI.

NR — Not reported.

EPA reviewed technical reports on the ore mining industry collected by the Office of Enforcement and Compliance Assistance to determine if any large ore mines with a history of non-compliance are not reporting to PCS and TRI databases. These reports contain a variety of sampling data for groundwater and surface water near ore mine sites, but do not provide wastewater discharge data. EPA verified that all of the major sites identified in the technical reports as currently operational are included in PCS and TRI databases.

EPA also reviewed why some facilities in the PCS databases do not report to TRI (Section 8.7.1). EPA compared the discharges in the PCS databases to the threshold reporting values for TRI. From this analysis, some ore mines that meet threshold reporting requirements are not reporting to TRI (Krejci, 2008a).

8.7 Comparison of Discharges to Part 440 ELGs and Permit Limits

EPA analyzed top pollutant discharges (larger than 4,000 TWPE) in *PCSLoads2004_v4* and compared them to permit limits for the appropriate outfalls the in permits gathered through OTIS.[13] Table 8-10 lists the discharges analyzed and the applicable permit limit for each discharge. EPA analyzed seven discharges from three facilities and found the following:

- EPA reviewed the Northshore mercury discharges separately (see Table 8-7). These discharges contribute 76 percent of the category TWPE. The facility's permit requires that mercury be monitored in the wastewater but does not set a numerical limit.
- None of the discharges reviewed by EPA exceeded effluent limits; however, the facilities were only required to monitor for the pollutants (i.e., the permit did not require numerical limitations for the pollutants). These discharges accounted for 27 percent[14] of the category TWPE in *PCSLoads2004_v4*.
- Three of the 11 pollutant discharges reviewed by EPA were reported in concentrations above the detection limit but below the permit limit.
- One of the 11 pollutant discharges reviewed by EPA did not exceed effluent limits because the pollutant of concern was not detected in the facility's wastewater.

[13] EPA has not obtained a permit for Kennecott Copper in Salt Lake City, Utah.
[14] Including the mercury discharges from Northshore Mining Company, pollutant discharges where a facility was only required to monitor for the pollutant in question represent 85 percent of the Ore Mining Category TWPE.

Table 8-10. Compliance Status of High TWPE Discharges

Name	Location	Parameter	Outfall(s)	Max. Conc. In *PCSLoads2004_v4* (mg/L)	Permitted Limit (mg/L)	Total TWPE	Cumulative TWPE	Compliance Status
Climax Molybdenum Company	Summit County, CO	Fluoride, Total	1	6.7	Monitor Only	8,526	8,526	Monitor Only
		Molybdenum, Total	1	2.42	Monitor Only	18,229	18,229	Monitor Only
Doe Run, Viburnum Mine #35	Viburnum, MO	Cadmium, Total Recoverable	1,2,3,4	BDL [a]	Monitor Only	5,080	5,080	BDL
		Lead, Total Recoverable	1	0.207	0.264	2,667	8,644	In Compliance
			3	0.304	Monitor Only	5,732		Monitor Only
			4	0.005	Monitor Only	245		Monitor Only
Lac Minerals (USA) Inc	Lead, SD	Aluminum, Total Recoverable	1,2,3,4,STR	1.27 [a]	Monitor Only	10,852	10,852	Monitor Only
		Arsenic, Total Recoverable	3	0.005	Monitor Only	10,119	10,153	Monitor Only
			STR	0.005	Monitor Only	34		Monitor Only
		Copper, Total Recoverable	2	0.005	0.3	2,782	4,769	In Compliance
			3	0.005	0.3	1,987		In Compliance

Source: *PCSLoads2004_v4*; NPDES Permits (Krejci, 2008b).
a — Maximum concentration reported at any of the permitted outfalls.
BDL — Below Detection Limit

8.8 Permit Analysis

EPA reviewed permits downloaded from the Online Tracking Information System (OTIS) and compared effluent limits across states for similar mine types. OTIS is a data system developed by EPA to monitor compliance with permits under multiple EPA programs. OTIS also contains electronic permits for 28 of the 115 ore mining facilities that EPA identified as having NPDES permits. EPA compared permit limits for the 28 permits and analyzed the self-monitoring data included with 16 of the permits. For facilities with available permits, Table 8-11 lists the mine type and associated permit ID.

EPA analyzed the permits to determine the basis for effluent limits used by permitting authorities and to evaluate the level of control of ore mining discharges provided by NPDES (Section 8.8.1). EPA analyzed the available monitoring data to investigate any trends in reported discharges (Section 8.8.2).

Table 8-11. NPDES Permits by Mine Type

Type of Mine	Permit ID	Type of Mine	Permit ID
Bauxite	AR0000582	Lead	MO0001848
Copper	AZ0000035	Lead, Zinc	AK0038652
	UT0022403		CO0041467
Gold	AK0049514		ID0000175
	AK0050571		MO0100226
	AK0053341		AK0043206
	CO0024562	Lead, Zinc, Silver, Gold	ID0025402
	CO0038954	Molybdenum	WY0026689
	CO0043648	Uranium	TN0001732
	ID0026468	Zinc	TN0001759
	ID0027022		TN0004227
	SD0025852		TN0027677
	SD0025933		TN0060127
	SD0026883		
	SD0026905		

8.8.1 Effluent Limits Comparison

Table 8-12 at the end of this section summarizes effluent limits for wastewater from the Ore Mining Category. The table presents minimum, average, and maximum effluent limits for monthly average and daily maximum concentrations, summarized by mine type. All of the data in the tables below were gathered from the 28 permits and associated permit fact sheets that EPA compiled during the category review.

In addition to compiling permit limits, EPA used information from permit fact sheets to determine the basis for each permit limit. Permit writers based some limits on ELGs set by EPA, and others on water quality. For metals discharges, EPA found that water quality-based limits are typically set for the following parameters:

- Total mercury;
- Total recoverable lead;
- Total recoverable copper;
- Total recoverable cadmium; and
- Total recoverable zinc.

8.8.2 Review of Permit Monitoring Data

EPA compiled data from the 12 permits that included self-monitoring data in the permit facts sheets. These data included various metals concentrations and other conventional pollutants as well as flow data. EPA analyzed the monitoring data to analyze trends in metals concentrations by type of mine. EPA identified mine type by the information in the permit fact sheets. Table 8-13 summarizes the data by maximum and average metals concentrations for each mine type. Gold mines monitored for the most analytes; EPA focused the analysis on the gold mine discharges, finding that:

- Only one gold mine (City and Borough of Juneau Mine in Juneau, AK) detected mercury (<0.00006 mg/L, which is below the Subpart J ELGs of 0.001 mg/L monthly average, 0.002 mg/L daily maximum).
- Four of the five gold mines with monitoring data measured arsenic at concentrations above detection (on average). Part 440 Subpart J does not limit arsenic.
- Four of the five gold mines monitoring for cadmium detect it above the lower detection limit. For these four facilities, maximum recorded concentrations range from 0.00026 to 0.0031 mg/L, which is below the Subpart J ELGs (0.05 mg/L monthly average, 0.1 mg/L daily maximum).
- Cyanide, which contributed 122,000 to the Ore Mining Category TWPE in *PCSLoads2004_v4*, is only monitored at one of the 12 mines reviewed — a molybdenum mine. It was detected at concentrations from 0.00524 to 0.04 mg/L. Part 440 Subpart J does not limit cyanide.
- Molybdenum, which contributed 155,000 to the Ore Mining Category TWPE in *PCSLoads2002_v4*, is only monitored at two of the 12 mines reviewed (one copper and one molybdenum). It was detected from 1.313 to 2.76 mg/L. Part 440 Subpart J does not limit molybdenum.
- All of the five mines monitoring lead (four gold mines and one lead/zinc mine) detected it above the detection limit on average. Part 440 Subpart J limits lead concentrations in wastewater discharges to 0.3 mg/L monthly average and 0.6 mg/L daily maximum. One mine detected lead at 3.59 mg/L, but all other mines detected it at less than 0.385 mg/L.

Table 8-12. Average Metals Concentrations (in mg/L) for Ore Mines with Self-Monitoring Data [a, b]

Parameter	Copper Mines (1)		Gold Mines (5)		Lead, Zinc Mines (2)		Molybdenum Mines (1)		Zinc Mines (3)	
	Avg Conc	Max Conc	Avg Conc	Max Conc	Avg Conc	Max Conc	Avg Conc	Max Conc	Avg Conc	Max Conc
Aluminum	NR	28	1.9	19	NR	NR	NR	NR	NR	NR
Arsenic	ND	ND	0.037	0.22	NR	NR	NR	NR	NR	NR
Cadmium	NR	ND	0.00094	0.0080	0.00050	0.00080	NR	NR	NR	NR
Copper	NR	0.53	0.20	12	0.0040	0.0090	0.0035	0.060	0.0057	0.018
Cyanide	NR	NR	NR	NR	NR	NR	.00524	0.040	NR	NR
Iron	NR	33	0.035	1.37	0.030	0.46	NR	NR	NR	NR
Fluoride	NR	3.0	NR	NR	NR	NR	4.4	9.2	NR	NR
Lead	NR	ND	0.00047	0.003	0.001	0.00040	NR	NR	NR	NR
Magnesium	NR	360	NR	NR	NR	NR	NR	NR	NR	NR
Manganese	NR	3.0	0.68	5.55	0.65	1.56	0.75	2.7	NR	NR
Mercury	NR	ND	ND	0.00060	ND	ND	NR	NR	ND	ND
Molybdenum	NR	0.050	NR	NR	NR	NR	1.31	2.8	NR	NR
Nickel	NR	ND	0.013975	0.064	NR	NR	NR	NR	NR	NR
Silver	NR	NR	0.00034	0.00050	ND	0.00013	0	0.000070	NR	NR
Zinc	NR	0.28	0.010	0.040	0.11	0.14	0.071	0.90	0.25	1.1

Source: NPDES Permit Fact Sheets (Krejci, 2008b).
a — EPA determined the type of ore being mined or processed using information from permit fact sheets.
b — Concentrations below the detection limit are specified at the detection limit for summarization.
( ) — Number of similar mines.
ND — Non-detect.
NR — Not reported.

8.9 Ore Mining Category Conclusions

The conclusions of the Ore Mining Category review are as follows:

- The high TWPE ranking for the Ore Mining Category in the 2008 annual review was due to discharges of mercury from one facility: Northshore Mining Company in Silver Bay, MN. The facility's NPDES permit does not set limits for mercury, but requires quarterly monitoring, which shows detections of mercury at 0.005 and 0.7 mg/L (*PCSLoads2004_v4*). The facility mines and processes taconite, which can be associated with mercury discharges (MDNR, 2003). In addition, the facility generates power in a co-located power plant.
- Pollutants without effluent limits for which ore mining facilities are only required to monitor contributed approximately 85 percent of the category TWPE: 76 percent of TWPE from mercury discharges from Northshore and 9 percent of the category TWPE from other facilities in *PCSLoads2004_v4*.
- EPA obtained facility information for 398 facilities. *PCSLoads2004_v4* and *TRIReleases2004_v3* represent only 73 facilities (18 percent).
- EPA intends to continue its review of arsenic discharges from copper and gold mines in the 2009 annual review.

8.10 Ore Mining Category References

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Table 8-13. Summary Statistics of Effluent Limits for Ore Mining Facilities

Type of Mine [a]	Regulated Parameter	ELG Monthly Average (mg/L)	Average Monthly Concentration (mg/L)			ELG Daily Maximum (mg/L)	Maximum Daily Concentration (mg/L)		
			Min	Avg	Max		Min	Avg	Max
Bauxite	Aluminum, Total	1	1	1	1	2	2	2	2
	Iron, Total	0.5	0.5	0.5	0.5	1	1	1	1
Copper	Aluminum, Total Recoverable	NA	0.98	0.98	0.98	NA	0.75	0.75	0.75
	Lead, Total Recoverable	0.3	0.029	0.029	0.029	0.6	0.01	0.03	0.05
	Mercury, Total Recoverable	0.001	0.00005	0.00005	0.00005	0.002	0.002	0.002	0.002
	Zinc, Total Recoverable	0.75	0.75	0.75	0.75	1.5	0.38	0.94	1.5
Gold	Aluminum, Total Recoverable	NA	0.071	0.071	0.071	NA	0.14	0.14	0.14
	Arsenic, Total Recoverable	NA	0.05	0.63	4.4	NA	0.1	1.2	8.8
	Cadmium, Dissolved	0.05	0.0062	0.024	0.05	0.1	0.1	0.1	0.1
	Cadmium, Total Recoverable		0.0001	0.026	0.05		0.0002	0.053	0.1
	Chromium, Total Recoverable	NA	0.008	0.0093	0.011	NA	0.0016	0.014	0.016
	Copper, Dissolved	0.15	0.029	0.073	0.15	0.3	0.05	0.14	0.3
	Copper, Potentially Dissolved		0.0036	0.031	0.059		0.0048	0.051	0.098
	Copper, Total Recoverable		0.0019	0.082	0.15		0.0038	0.16	0.3
	Iron, Total Recoverable	NA	0.8	6.4	23	NA	1.6	13	46
	Lead, Dissolved	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.6

Table 8-13. Summary Statistics of Effluent Limits for Ore Mining Facilities

Type of Mine [a]	Regulated Parameter	ELG Monthly Average (mg/L)	Average Monthly Concentration (mg/L)			ELG Daily Maximum (mg/L)	Maximum Daily Concentration (mg/L)		
			Min	Avg	Max		Min	Avg	Max
Gold	Lead, Potentially Dissolved	0.3	0.00055	0.015	0.03	0.6	0.01	0.47	0.92
	Lead, Total Recoverable		0.0005	0.15	0.3		0.0009	0.32	0.6
	Manganese, Dissolved	NA	3.8	3.8	3.8	NA	5.9	5.9	5.9
	Manganese, Total Recoverable	NA	0.05	0.05	0.05	NA	0.073	0.073	0.073
	Mercury, Total	0.001	9.8E-06	0.00024	0.001	0.002	0.00002	0.00055	0.002
	Mercury, Total Recoverable		0.000012	0.00078	0.001		0.0014	0.0019	0.002
	Nickel, Total Recoverable	NA	0.013	0.28	1.5	NA	0.026	0.56	3
	Silver, Potentially Dissolved	NA	6.9E-06	0.0004	0.0008	NA	0.00019	0.011	0.021
	Silver, Total Recoverable	NA	0.0002	0.0036	0.02	NA	0.0004	0.003	0.013
	WAD Cyanide	NA	0.0043	0.026	0.08	NA	0.0081	0.025	0.066
	Zinc, Dissolved	0.75	0.6	0.68	0.75	1.5	1.5	1.5	1.5
	Zinc, Potentially Dissolved		0.54	0.54	0.54		0.6	0.6	0.6
	Zinc, Total		0.00033	0.00033	0.00033		0.00036	0.00036	0.00036
	Zinc, Total Recoverable		0.018	0.42	0.75		0.037	0.84	1.5
Lead	Cadmium, Dissolved	0.05	0.057	0.057	0.057	0.1	0.094	0.094	0.094
	Cadmium, Total Recoverable		0.012	0.012	0.012		0.019	0.019	0.019
	Chromium, Dissolved	NA	0.17	0.17	0.17	NA	0.28	0.28	0.28

Table 8-13. Summary Statistics of Effluent Limits for Ore Mining Facilities

Type of Mine [a]	Regulated Parameter	ELG Monthly Average (mg/L)	Average Monthly Concentration (mg/L)			ELG Daily Maximum (mg/L)	Maximum Daily Concentration (mg/L)		
			Min	Avg	Max		Min	Avg	Max
Lead	Copper, Total Recoverable	0.15	0.029	0.07	0.084	0.3	0.047	0.05	0.051
	Cyanide, amen. to chlorination	NA	0.0012	0.0012	0.0012	NA	0.022	0.022	0.022
	Lead, Total Recoverable	0.3	0.18	0.2	0.26	0.6	0.3	0.33	0.42
	Mercury, Total	0.001	1.2E-06	1.2E-06	1.2E-06	0.002	2.4E-06	2.4E-06	2.4E-06
	Zinc, Dissolved	0.75	0.99	0.99	0.99	1.5	1.6	1.6	1.6
	Zinc, Total Recoverable		0.34	0.34	0.34		0.56	0.56	0.56
Lead, Zinc	Cadmium, Dissolved	NA	0.016	0.043	0.057	NA	0.025	0.071	0.094
	Cadmium, Total Recoverable	NA	0.0007	0.0011	0.002	NA	0.0018	0.0022	0.0034
	Chlorine, Total Residual	NA	2.2	2.2	2.2	NA	3.6	3.6	3.6
	Copper, Dissolved	0.15	0.034	0.034	0.034	0.3	0.056	0.056	0.056
	Copper, Potentially Dissolved		0.0086	0.018	0.028		0.013	0.027	0.044
	Copper, Total Recoverable		0.000021	0.015	0.051		0.000042	0.033	0.084
	Cyanide, Total	NA	0.004	0.004	0.004	NA	0.009	0.009	0.009
	Lead, Dissolved	0.3	0.023	0.023	0.023	0.6	0.037	0.037	0.037
	Lead, Potentially Dissolved		0.0026	0.0055	0.009		0.067	0.14	0.23
	Lead, Total Recoverable	0.3	0.0081	0.098	0.26	0.6	0.02	0.16	0.43
	Mercury, Total	0.001	0.00001	0.00022	0.001	0.002	0.00002	0.00064	0.002

Table 8-13. Summary Statistics of Effluent Limits for Ore Mining Facilities

Type of Mine [a]	Regulated Parameter	ELG Monthly Average (mg/L)	Average Monthly Concentration (mg/L)			ELG Daily Maximum (mg/L)	Maximum Daily Concentration (mg/L)		
			Min	Avg	Max		Min	Avg	Max
Lead, Zinc	Silver, Total Recoverable	NA	0.0016	0.0023	0.0033	NA	0.0027	0.0039	0.0056
	Zinc, Potentially Dissolved	0.75	0.15	0.26	0.38	1.5	0.15	0.26	0.38
	Zinc, Total Recoverable		0.071	0.29	0.75		0.19	0.59	1.5
Lead, Zinc, Silver, Gold	Cadmium, Total Recoverable	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1
	Copper, Total Recoverable	0.15	0.11	0.11	0.11	0.3	0.3	0.3	0.3
	Lead, Total Recoverable	0.3	0.3	0.3	0.3	0.6	0.6	0.6	0.6
	Mercury, Total	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002
	Zinc, Total Recoverable	0.75	0.5	0.5	0.5	1.5	1	1	1
Molybdenum	Cadmium, Total Recoverable	0.05	0.0035	0.0093	0.024	0.1	0.0052	0.015	0.035
	Chromium, Total Recoverable	NA	0.02	0.02	0.02	NA	0.04	0.04	0.04
	Copper, Total Recoverable	0.15	0.015	0.052	0.15	0.3	0.022	0.099	0.3
	Lead, Total Recoverable	0.3	0.0083	0.021	0.064	0.6	0.012	0.034	0.094
	Mercury, Total	NA	0.000018	0.00012	0.00032	NA	0.000037	0.00022	0.00061
	Selenium, Total Recoverable	NA	0.011	0.042	0.11	NA	0.017	0.058	0.15
	Silver, Total Recoverable	NA	0.006	0.006	0.006	NA	0.012	0.012	0.012
Molybdenum	Zinc, Total Recoverable	0.5	0.14	0.33	0.75	1	0.21	0.62	1.5
Uranium	Uranium, Total	2	2	2	2	4	4	4	4
	Zinc, Total	0.5	0.5	0.5	0.5	1	1	1	1

Table 8-13. Summary Statistics of Effluent Limits for Ore Mining Facilities

Type of Mine [a]	Regulated Parameter	ELG Monthly Average (mg/L)	Average Monthly Concentration (mg/L)			ELG Daily Maximum (mg/L)	Maximum Daily Concentration (mg/L)		
			Min	Avg	Max		Min	Avg	Max
Zinc	Cadmium, Total	0.05	0.007	0.025	0.05	0.1	0.033	0.077	0.1
	Copper, Total	0.15	0.062	0.12	0.15	0.3	0.1	0.23	0.3
	Lead, Total	0.3	0.024	0.12	0.3	0.6	0.6	0.6	0.6
	Mercury, Total	0.001		0.00057	0.001	0.002	0.0016	0.0019	0.002
	Zinc, Total	0.75	0.5	0.66	0.75	1.5	0.76	1.2	1.5

Source: NPDES Permits (Krejci, 2008b).
a — EPA determined the type of ore being mined or processed at the facilities above using information from permit fact sheets.

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1031 1044	AK0038652	99752-RDDGP-90MIL	Teck Cominco Alaska Inc	Kotzebue	AK	49920	Y	Y	Y	Y
1031	AK0043206	99801-KNNCT-13401	Kennecott Greens Crk Mining Co	Juneau	AK	41730	Y	Y	Y	Y
1041	AK0049514		Juneau, City & Borough Of	Juneau	AK	41730		Y	Y	
1041	AK0050571		Coeur Alaska Inc	Juneau	AK	41730		Y	Y	
1041	AK0053341		Teck-Pogo Inc	Delta Junction	AK	22650		Y	Y	
1011	AL0071111		Tuscaloosa Steel Mobile Dri	Mobile	AL	56000		Y	N	
1021	AZ0000035	85237-SRCNC-HWY17	Asarco, Inc	Hayden	AZ	37370		Y	Y	Y
1021	AZ0020389		Resolution Copper	Superior	AZ	83250		Y	Y	
1021	AZ0020401	85539-BHPCP-HWY60 85539-BHPCP-HWY6A	BHP Copper	Miami	AZ	52540	Y	Y	Y	Y
1021	AZ0020516		Phelps Dodge	Christmas	AZ	16320		Y	Y	
1021 1061	AZ0022268	86321-CYPRS-1MAIN	Phelps Dodge Bagdad, Inc	Bagdad	AZ	05550	Y	Y	Y	Y
1021	AZ0022705	85540-PHLPS-4521U	Phelps Dodge Morenci, Inc	Morenci	AZ	54020	Y	Y	Y	Y
1021	AZ0024112		Carlota Copper Company	Miami /T/	AZ	52540		Y	Y	
1021	AZ0024546		Phelps Dodge Corp	Yavapai County	AZ	97100		Y	Y	
1021	CA0081876		Mining Remedial Recovery Co	Redding	CA	63540		Y	Y	
1061	CO0000230	80468-CLMXM-19302	Climax Molybdenum Company	Grand County	CO	38210		Y	Y	Y
1061	CO0000248		Climax Molybdenum Company	Summit County	CO	86960		Y	Y	
1031	CO0000591		Res-Asarco Joint Venture	Lake County	CO	53110		Y	Y	
1044	CO0000710		Homestake Mining Company	Mineral County	CO	62350		Y	Y	
1041	CO0024562	80860-CRPPL-2755S	Cripple Crk&Victor Gold Mining	Teller County	CO	87510		Y	Y	
1041	CO0027529		Gold King Mines Corporation	San Juan County	CO	80310		Y	Y	

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1041	CO0032751		Calais Resources Colorado, Inc	Boulder	CO	08820		Y		
1031	CO0035394		Climax Molybdenum Company	Gunnison County	CO	40870		Y	Y	
1041	CO0037206		Walker Ruby Trust Mining Co.	Ouray County	CO	68050		Y		
1041	CO0038334		London Mine Llc	Park County	CO	69950		Y	Y	
1044	CO0038954		Platoro Mining Co&Union Gold	Conejos County	CO	18750		Y	Y	
1061	CO0041467	80438-CLMXM-9MILE	Climax Molybdenum Co.	Clear Creek County	CO	16580		Y	Y	Y
1041	CO0043168		Hunter Gold Mining, Inc.	Gilpin County	CO	36210		Y		
1041	CO0043648		Cripple Creek & Victor Gold	Teller County	CO	87510	Y	Y	Y	
1041	CO0045756		Specie Ridge Holding Co., Inc.	Dolores County	CO	24490		Y		
1041	CO0046167		New Cardinal Llc	Boulder County	CO	08830		Y		
1031	ID0000027		Coeur Silver Valley Inc	Osburn	ID	67500		Y	Y	
1044	ID0000159		Sunshine Precious Metals Inc	Osburn	ID	67500		Y		
1031	ID0000167		Hecla Mining Co	Mullan	ID	61750		Y		
1031	ID0000175		Hecla Mining Co	Mullan	ID	61750		Y	Y	
1061	ID0025259		Noranda Mining Inc	Cobalt	ID	18700		Y		
1061	ID0025402	83227-THMPS-SQUAW	Thompson Creek Mining Co	Clayton	ID	17750	Y	Y	Y	Y
1044	ID0025429		Coeur Silver Valley Inc	Wallace	ID	93750		Y		
1041	ID0026468		Hecla Mining Co	Stanley	ID	85500		Y	Y	
1041	ID0027022		Meridian Beartrack Co	Salmon	ID	80250		Y	Y	
1011	LA0103284		American Iron Reduction	Convent	LA	70723		N	N	
1011	MI0000094		Empire Iron Mining Partnership	Palmer	MI	72900		Y	Y	
1021	MI0006114		Copper Range Co	White Pine	MI	98830		Y	N	
1011	MI0038369		Tilden Mining Co	Ishpeming	MI	47700		Y	Y	

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1011	MI0045063		National Steel-Dober Mine Cpx	Stambaugh Twp	MI	89350		Y	N	
1011	MN0046981		Northshore Mining Co;Cliffs Mn	Babbitt	MN	05000		Y	Y	
1011	MN0055301		Northshore Mining/Silver Bay P	Silver Bay	MN	86750		Y	Y	
1031	MO0000086		Doe Run, Viburnum Div	Viburnum	MO	81260		Y	Y	
1011	MO0000574		Upland Wings	Sullivan	MO	77100		Y	Y	
1031	MO0001848	63629-BRSHY-HWYKK	Doe Run, Brushy Cr Mine/M	Viburnum	MO	81260	Y	Y	Y	Y
1031	MO0001856	63629-FLTCH-HWYTT	Doe Run,Fletcher Mine/Mil	Viburnum	MO	81260	Y	Y	Y	Y
1031	MO0001872		Cominco, Magmont Mine	Bixby	MO	06780		Y	Y	
1031	MO0100218		Doe Run, West Fork Unit	Bunker	MO	11280		Y	Y	
1031	MO0100226		Doe Run,Viburnum Mine #35	Viburnum	MO	81260		Y	Y	
1021 1061	MT0000191	59701-MNTNR-600SH	Montana Resources	Butte	MT	12240	Y	Y	Y	
1021	MT0024716		Stillwater Mining Company	Nye	MT	61920		Y	N	
1041	MT0025020		Montana Gold & Sapphires Inc	Lewis And Clark Coun	MT	49400		Y	Y	
1041	MT0030015		M & W Milling & Refining Inc	Virginia City	MT	88020		Y		
1031	MT0030031		Asarco Inc (Mike Horse)	Lewis And Clark Coun	MT	49400		Y		
1041	MT0030252		Tvx Mineral Hill Mine	Jardine	MT	43920		Y		
1044	MT0030279		Noranda Minerals Corp	Lincoln County	MT	50300		Y		
1021	MT0030287		Revett Silver Company	Noxon	MT	61740		Y	N	
1021	NM0020435	88043-CHNMN-210CO	Chino Mines Co-Hurley	Hurley	NM	42000		Y	Y	Y
1061	NM0022306		Molycorp Inc - Questa	Questa	NM	69930	Y	Y	Y	
1041	NM0028711		Pegasus Gold Corporation	Santa Fe County	NM	78970		Y		
1031	NY0001791		Balmat Mines & Mill	Balmat N Y	NY	04600		Y	Y	

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1031	NY0109126		Pierrepont Mine	Pierrepont Manor	NY	65400		Y		
1041	SC0040479		Haile Gold Mine	Kershaw	SC	45300		Y		
1041	SC0041378		Kennecott/Ridgeway Gold Mine	Ridgeway	SC	74400		Y		
1041	SD0000043 SD0025933	57754-HMSTK-630ES	Homestake Mining Co-Gold Div	Lead	SD	49680		Y	Y	
1041	SD0025852	57754-WHRFR-TROJA	Wharf Resources (Usa), Inc.	Lead	SD	49680	Y	Y	Y	Y
1041	SD0026883		Lac Minerals (Usa) Inc	Lead	SD	49680		Y	Y	
1041	SD0026905		Golden Reward Mining Co	Lead	SD	49680		Y	Y	
1031	TN0001732		Asarco, Inc., Tn Mines Div.	Jefferson City	TN	44400		Y	Y	
1031	TN0001741		Asarco, Inc., Tn Mines Div.	New Market	TN	62160		Y	Y	
1031	TN0001759		Asarco, Inc., Tn Mines Div.	Mascot	TN	55560		Y	Y	
1031	TN0004227		Mossy Creek Mining, Llc	Elmwood	TN	28440		Y	Y	
1031	TN0027677		Asarco, Inc., Tn Mines Div.	Jefferson County	TN	44410		Y	Y	
1031	TN0029360		Mossy Creek Mining, Llc	Gordonsville	TN	36120		Y	Y	
1031	TN0057029		Mossy Creek Mining, Llc	New Market	TN	62160		Y	Y	
1031	TN0060127	37881-SVGZN-RTE13	Mossy Creek Mining, Llc	Thorn Hill	TN	85200		Y	Y	Y
1031	TN0061468		Asarco, Inc. Tn Mines Div.	Jefferson City	TN	44400		Y	Y	
1031	TN0064289		Mossy Creek Mining, Llc	Carthage	TN	13920		Y		
1021	UT0000051	84006-KNNCT-8362W	Kennecott Copper Co	Salt Lake City	UT	77880	Y	Y	Y	Y
1031	UT0022403		Jordanelle Special Service Dis	Heber /City/	UT	35360		Y	Y	
1031	UT0025259		Lexco, Inc. (E)	Vernal	UT	91800		Y		
1011	WV0044903		Reiss Viking	Fairmont	WV	26940		Y	N	
1031		08857-BLNDR-1JAKE	Blonder Tongue Labs	Old Bridge	NJ					Y
1061		19720-MRCNM-301PI	American Minerals Inc.	New Castle	DE					Y
1021		44095-SKLDC-34580	Skrl Die Casting Inc	Eastlake	OH					Y
1041		59638-MNTNT-5MILE	Apollo Gold Corp. Montana Tunnels	Jefferson City	MT		Y			Y

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1041		59759-GLDNS-453MO	Golden Sunlight Mines Inc	Whitehall	MT					Y
1061		62982-MRCNM-FERRE	American Minerals Inc.	Rosiclare	IL					Y
1031		63638-SWTMM-HIGHW	Doe Run Resources Corp. Sweetwater Mine/Mill	Ellington	MO		Y			Y
1031		65440-BCKMN-HWYKK	Buick Mine/Mill	Boss	MO					Y
1061		79922-MRCNM-3666D	American Minerals Inc	El Paso	TX					Y
1044		83846-LCKYF-I90EX	Hecla Mining Co Lucky Friday Mine Unit	Mullan	ID		Y			Y
1021		83873-SLVRV-LAKEG	Coeur Silver Valley Inc	Wallace	ID					Y
1021		84006-KNNCT-12300	Kennecott Utah Copper Mine Concentrators & Power Plant	Copperton	UT					Y
1041		84006-KNNCT-8200S	Kennecott Barneys Canyon Mining Co	Bingham Canyon	UT		Y			Y
1021		85532-NSPRT-POBOX	Phelps Dodge Miami Inc	Claypool	AZ		Y			Y
1021		85603-PHLPS-36WHW	Phelps Dodge Mining Co Copper Queen Branch	Bisbee	AZ	2004				Y
1021 1061		85614-CYPRS-6200W	Phelps Dodge Sierrita Inc	Green Valley	AZ	2004	Y			Y
1021		85629-SRCNC-4201W	Asarco Inc. Mission Complex	Pima County	AZ		Y			Y
1021		85653-SLVRB-25000	Silver Bell Mining Llc	Marana	AZ	2004				Y
1021		86401-QTRLM-16MIL	Equatorial Mineral Park Inc	Kingman	AZ	2004				Y
1061		88031-MRCNM-2010F	American Minerals Inc	Deming	NM					Y
1021		88065-PHLPS-HWY90	Phelps Dodge Tyrone Inc	Tyrone	NM		Y			Y
1041		89045-SMKYV-1SMOK	Smoky Valley Common Operation	Round Mountain	NV					Y
1041		89316-RBYHL-INTER	Ruby Hill Mine	Eureka	NV					Y
1021		89319-BHPCP-7MILE	Robinson Nevada Mining Co	Ruth	NV					Y
1041		89406-KNNCT-55MIL	Kennecott Rawhide Mining Co	Fallon	NV		Y			Y
1041		89414-GTCHL-28MIN	Placer Turquoise Ridge Inc	Golconda	NV					Y

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1041		89414-KNSNY-60MIL	Newmont Midas Operations	Midas	NV		Y			Y
1041		89414-NWMNT-35MIL	Newmont Mining Corp Twin Creeks Mine	Golconda	NV		Y			Y
1041		89415-SMRLD-28LUC	Esmeralda Mine	Hawthorne	NV					Y
1041		89418-FLRDC-EXIT1	Florida Canyon Mining Inc	Imlay	NV					Y
1044		89419-CRRCH-180EX	Coeur Rochester Inc	Lovelock	NV		Y			Y
1041		89438-GLMSM-3MILE	Glamis Marigold Mining Co	Valmy	NV		Y			Y
1041		89438-NWMNT-EIGHT	Newmont Mining Corp Trenton Canyon Mine	Valmy	NV					Y
1041		89438-NWMNT-STONE	Newmont Mining Corp Lone Tree Mine	Valmy	NV		Y			Y
1041		89801-JRRTT-50MIL	Queenstake Resources Ltd. Jerritt Canyon Mine	Elko	NV		Y			Y
1041		89803-BLDMN-70MIL	Placer Dome Inc. Bald Mountain Mine	Elko	NV		Y			Y
1041		89803-BRRCK-27MIL	Barrick Goldstrike Mines Inc	Elko	NV					Y
1041		89820-BTTLM-COPPE	Newmont Mining Corporation-Copper Canyon Facility	Battle Mountain	NV					Y
1044		89820-CHBYM-1MCCO	Newmont Mining Corp Mccoy/Cove Mine	Battle Mountain	NV					Y
1041		89821-CRTZG-STARA	Cortez Gold Mines	Crescent Valley	NV					Y
1041		89822-NWMNT-25MIL	Newmont Mining Corp Carlin North Area	Carlin	NV					Y
1041		89822-NWMNT-6MAIL	Newmont Mining Corp Carlin South Area	Carlin	NV					Y
1041		92227-NWMNT-6502E	Western Mesquite Mines Inc	Brawley	CA		Y			Y
1041		93554-GLMSR-27850	Glamis Rand Mine	Randsburg	CA					Y
1041		93562-CRBRG-WINGA	Cr Briggs Corp	Trona	CA		Y			Y
1021		97828-PRKSB-331GO	Parks Bronze	Enterprise	OR					Y

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1041		99118-CHBYN-2400W	K2 Mine	Curlew	WA					Y
1031		99153-PNDRL-1382P	Teck Cominco American Inc. Pend Oreille	Metaline Falls	WA		Y			Y
1041		99166-KTTLR-363FI	Kinross Gold Corp. KETTLE RIVER OPERATIONS MILL	Republic	WA		Y			Y
1041		99707-FRTKN-1FORA	FORT KNOX MINE	Fairbanks	AK					Y
1041		99712-TRNRT-1TWIN	TRUE NORTH MINE	Fairbanks	AK					Y
1031		99752-RDDGP-13MIL	DELONG MOUNTAIN TRANSPORTATION FACILITY PORT SITE	Kotzebue	AK					Y
1041			Kinross Gold Corp. Fort Knox	Fairbanks County	AK		Y			
1021			ASARCO Inc. Ray	Pinal County	AZ		Y			
1021			ASARCO Inc. Silver Bell	Pima County	AZ		Y			
1021			BHP Copper Co. Pinto Valley	Gila County	AZ		Y			
1041			LKA International Golden Wonder	Hinsdale County	CO		Y			
1061			Phelps Dodge Corp. Henderson	Cleak Creek County	CO		Y			
1044			Silver Valley Resources Corp. Galena	Shoshone County	ID		Y			
1031			Doe Run Resources Corp. Buick	Iron County	MO		Y			
1031			Doe Run Resources Corp. Viburnum (#29 and #35)	Iron County	MO		Y			
1031			Doe Run Resources Corp. Viburnum (#38 and #35)	Iron County	MO		Y			
1041			Placer Dome Inc. Golden Sunlight	Jefferson County	MT		Y			

Table 8-14. Ore Mining Category Master Facility List

SIC Code(s) [a]	NPDES ID	TRI ID	Name	City	State	Zip	In USGS 2005?	PCS 2004		In TRI 2004?
								In DB	Major?	
1021 1061			Phelps Dodge Corp. Chino	Grant County	NM		Y			
1041			Barrick Gold Corp. Betze-Post	Eureka County	NV		Y			
1041			Barrick Gold Corp. Meikle	Elko County	NV		Y			
1041			Jipangu Inc. Florida Canyon	Pershing County	NV		Y			
1041			Jipangu Inc. Standard	Pershing County	NV		Y			
1041			Kinross Gold Corp. Smoky Valley Common Operation	Nye County	NV		Y			
1041			Newmont Mining Corp. Mule Canyon	Lander County	NV		Y			
1041			Newmont Mining Corp. Turquoise Ridge	Humboldt County	NV		Y			
1041			Placer Dome Inc. Cortez	Lander County	NV		Y			
1044			Kinross Gold Corp. Round Mountain	Nye County	NV		Y			
1044			Newmont Mining Corp. Eastern Nevada Operations	Elko County	NV		Y			
1021 1061			Quadra Mining Ltd. Robinson	White Pine County	NV		Y			
1021 1061			Kennecott Utah Copper Corp. Bingham Canyon	Salt Lake County	UT		Y			

Source: *PCSLoads2004_v3*; *TRIReleases2004_v4*.
a — EPA determined SIC codes by the mineral type listed in the USGS Minerals Yearbook.

9.0 PETROLEUM REFINING (40 CFR PART 419)

EPA selected the Petroleum Refining Category (40 CFR Part 419) for preliminary review because it continues to rank high, in terms of TWPE, in point source category rankings (see Tables 5-3 and 5-4 for the point source category rankings). EPA previously performed a detailed study of this industry, published as part of the 2004 Final ELG Plan (69 FR 53705). EPA has also reviewed discharges from petroleum refineries as part of its annual reviews since 2004. Each year, including this year of review, EPA has concluded that wastewater from petroleum refiners is not a hazard priority at this time.

9.1 Petroleum Refining Category Background

This subsection provides background on the Petroleum Refining Category including a brief profile of the petroleum refining industry and background on 40 CFR Part 419.

9.1.1 Petroleum Refining Industry Profile

The petroleum refining industry includes facilities that produce gasoline, kerosene, distillate fuel oils, residual fuel oils, and lubricants through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking, or other processes. This industry is represented by one SIC code 2911, Petroleum Refining; however, EPA includes operations from four other SIC codes as part of the review of the Petroleum Refining Category, considered potential new subcategories.[15]

Table 9-1 presents the number of facilities in the SIC codes that compose the petroleum refining industry. Because the U.S. Economic Census reports data by NAICS code, and TRI and PCS report data by SIC code, EPA reclassified the 2002 U.S. Economic Census by the equivalent SIC code. The facilities in SIC code 5171 do not correlate directly to a NAICS code and therefore EPA could not determine the number of facilities in the 2002 U.S. Economic Census for SIC code 5171.

Petroleum refineries discharge directly to surface water as well as to POTWs. Table 9-2 presents the types of discharges reported by facilities in the 2004 and 2005 TRI database. The majority of petroleum refineries reporting to TRI reported discharging directly. The majority of facilities reporting to TRI in SIC codes classified as potential new subcategories reported no water discharges, but facilities may be discharging pollutants in wastewater at levels below the TRI-reporting threshold.

[15] EPA reviews industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the SIC codes 2992, 2999, 4612, and 5171 (listed in Table 9-1) are similar to those of the Petroleum Refining Category (U.S. EPA, 2004). The tables in this section include discharge information from the potential new subcategories; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

Table 9-1. Number of Facilities in Petroleum Refining SIC Codes

SIC	2002 U.S. Economic Census	2004 PCS [a]	2004 TRI [b]	2005 TRI [b]
2911: Petroleum Refining	199	144	164	159
Potential New Subcategories				
2992: Lubricating Oils and Greases	407	21	130	129
2999: Products of Petroleum and Coal, NEC	74	22	30	35
4612: Crude Petroleum Pipelines	271	28	0	0
5171: Petroleum Bulk Stations and Terminals	NA [c]	481	540	523
Potential New Subcategories Total	**>752**	**552**	**700**	**687**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Major and minor dischargers.
b — Releases to any media.
c — Poor bridging between SIC codes and NAICS codes. Number of facilities could not be determined.
NA — Not applicable.
NEC — Not elsewhere classified.

Table 9-2. Petroleum Refining Category Facilities by Type of Discharge Reported in TRI 2004 and 2005

SIC Code	TRI 2004				TRI 2005			
	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
2911: Petroleum Refining	92	21	16	35	90	23	16	30
Potential New Subcategories								
2992: Lubricating Oils and Greases	7	16	5	102	7	16	6	100
2999: Products of Petroleum and Coal, NEC	6	0	0	24	7	0	0	28
4612: Crude Petroleum Pipelines	0	0	0	0	0	0	0	0
5171: Petroleum Bulk Stations and Terminals	129	20	13	378	134	19	13	357
Potential New Subcategories Total	**142**	**36**	**18**	**504**	**148**	**35**	**19**	**485**

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.
NEC — Not elsewhere classified.

9.1.2 40 CFR Part 419

EPA first promulgated ELGs for the Petroleum Refining Category (40 CFR Part 419) on October 18, 1982 (47 FR 46446). The five subcategories established all have limitations or standards set for BPT, BAT, BCT, PSES, NSPS, and PSNS. EPA established numerical limitations for ammonia as nitrogen, hexavalent chromium, phenolic compounds, sulfide, and total chromium in at least one subcategory. Section 7 of the 2004 TSD provides more information on the existing regulations for the Petroleum Refining Category (U.S. EPA, 2004).

9.2 Petroleum Refining Category 2004 Through 2008 Screening-Level Reviews

Over the years of EPA review, from 2004 through 2008, the TWPE associated with petroleum refineries has increased. Table 9-3 shows the screening-level results for the Petroleum Refining Category including the potential new subcategory SIC codes from the 2002 through 2005 TRI and PCS databases. Both the 2004 TRI and PCS TWPEs have increased compared to previous years. Also, the 2005 TRI TWPE increased compared to 2002 and 2003, but decreased compared to 2004. However, the largest increase in TWPE is in PCS from 2002 to 2004.

Table 9-3. Petroleum Refining Category Screening-Level Results

Year of Review	Year of Data Source	Petroleum Refining Category [a]		Potential New Subcategory for the Petroleum Refining Category [d]	
		TRI TWPE [b]	PCS TWPE [c]	TRI TWPE [b]	PCS TWPE [c]
2005	2002	467,009	165,076	3,922	445
2006	2003	498,367	NA	2,570	NA
2007	2004	669,434	818,705	2,592	7,944
2008	2005	627,618	NA	3,116	NA

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*; *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Includes TWPE from the potential new subcategory.
b — Direct and indirect water releases only.
c — Major and minor dischargers.
d — EPA reviews industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the SIC codes 2992, 2999, 4612, and 5171 (listed in Table 9-1) are similar to those of the Petroleum Refining Category (U.S. EPA, 2004). The tables in this section include discharge information from the potential new subcategories; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.
NA — Not applicable. EPA did not evaluate PCS data for 2003 and 2005.

9.3 Petroleum Refining Category 2004 Through 2008 Pollutants of Concern

Table 9-4 shows the five pollutants with the highest TWPE in *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2004_v3* for the Petroleum Refining Category. For comparison purposes, Table 9-5 provides similar information from the 2006 Final ELG Plan (71 FR 76644) using *TRIReleases2002_v4*, *TRIReleases2003_v2*, and *PCSLoads2002_v4*. With the exception of dioxin and dioxin-like compounds, the pollutants of concern and their relative contribution to the category's total TWPE remain the same. That is, the TWPE from the top pollutants in *TRIReleases* and *PCSLoads* from 2002 through 2005 generally remain the same, except for dioxin and dioxin-like compounds. The 2004 and 2006 TSDs discuss EPA's conclusions for pollutants other than dioxin and dioxin-like compounds (U.S. EPA, 2004; U.S. EPA, 2006). Section 9.4 discusses EPA's review of discharges of dioxin and dioxin-like compounds from petroleum refineries, while section 9.5 discusses EPA's review of discharges of polycyclic aromatic compounds (PACs) from petroleum refineries.

9.4 Petroleum Refining Category Dioxin and Dioxin-Like Discharges

The increase in the overall TWPE for the Petroleum Refining Category is largely due to increases of dioxin and dioxin-like compounds, as reflected in the TRI and PCS databases. The discharges of dioxin and dioxin-like compounds are from the petroleum refineries (SIC code 2911), not facilities in the potential new subcategories of the Petroleum Refining Category. Therefore, this section focuses on discharges of dioxin and dioxin-like compounds from petroleum refineries only.

EPA examined discharges of dioxin and dioxin-like compounds from petroleum refineries extensively for its detailed and previous preliminary studies. From these studies, EPA concluded that (U.S. EPA, 2004):

> *Dioxin and dioxin like compounds are produced during catalytic reforming and catalyst regeneration operations at petroleum refineries. Of the 163 petroleum refineries, 17 reported discharges of dioxin and dioxin-like compounds to TRI. Of the 17 refineries reported discharges in 2002, only five reported discharges based on analytical measurements. Only two of these facilities detected dioxin and dioxin-like compounds above the Method 1613B minimum level and both of these facilities measured dioxin at the point immediately following catalytic regeneration and prior to wastewater treatment.*

Table 9-4. 2008 Review: Petroleum Refining Category Pollutants of Concern [a]

Pollutant	PCS 2004 [b]			TRI 2004 [c]			TRI 2005 [c]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Dioxin and Dioxin-Like Compounds	1	0.000761	535,673	17	0.0157	558,877	15	0.0148	516,064
Sulfide	71	41,309	115,724	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Chlorine	16	100,888	51,368						
Aluminum	9	530,616	34,326						
Fluoride	11	432,123	15,124						
PACs	Pollutants are not in the top five PCS 2004 reported pollutants.			65	1,027	26,110	63	1,351	34,343
Lead and Lead Compounds				108	8,905	19,947	120	7,502	16,803
Nitrate Compounds				63	16,737,280	12,497	61	16,308,453	12,177
Mercury and Mercury Compounds				61	102	11,978	67	100	11,715
Petroleum Refining Category Total	**113 [d]**	**1,717,808,018**	**818,705**	**325 [d]**	**18,835,213**	**669,434**	**331 [d]**	**17,930,959**	**627,618**

Source: *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — This table presents the top five pollutants composing the category TWPE, including the potential new subcategory SIC codes. However, the potential new subcategories contribute negligible pounds and TWPE.
b — Discharges include only major dischargers.
c — Discharges include transfers to POTWs and account for POTW removals.
d — Number of facilities reporting TWPE greater than zero.
PACs — Polycyclic aromatic compounds.

Table 9-5. 2006 Review: Petroleum Refining Category Pollutants of Concern [a]

Pollutant	PCS 2002 [b]			TRI 2002 [c]			TRI 2003 [c]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Sulfide	77	29,851	83,626	Pollutants are not in the top five TRI 2002 reported pollutants			Pollutants are not in the top five TRI 2003 reported pollutants		
Chlorine	17	45,011	22,918						
Fluoride	12	406,609	14,231						
Silver	7	769	12,669						
Selenium	17	7,560	8,477						
Dioxin and Dioxin-Like Compounds	Pollutants are not in the top five PCS 2002 reported pollutants			16	0.0114	296,024	18	0.0123	374,030
PACs				61	3,309	85,642	59	1,291	32,825
Mercury and Mercury Compounds				68	124	14,465	66	110	12,912
Lead and Lead Compounds				97	5,644	12,643	116	9,882	22,136
Nitrate Compounds				62	16,796,417	12,541	61	15,706,670	11,728
Petroleum Refining Category Total	**118** [d]	**7,606,670,158**	**165,076**	**352** [d]	**18,412,828**	**467,009**	**343** [d]	**17,314,282**	**498,367**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
a — This table presents the top five pollutants composing the category TWPE, including the potential new subcategory SIC codes. However, the potential new subcategories contribute negligible pounds and TWPE.
b — Discharges include only major dischargers.
c — Discharges include transfers to POTWs and account for POTW removals.
d — Number of facilities reporting TWPE greater than zero.
PACs — Polycyclic aromatic compounds.

Table 9-8, at the end of this section, lists all of the dioxin and dioxin-like compound discharges reported to TRI from 2002 to 2005. The 2004 and 2005 data show the same trend that was seen in the previous reviews. Seventeen facilities reported discharges of dioxin or dioxin-like compounds to TRI in 2004 and 15 facilities reported discharges of dioxin or dioxin-like compounds to TRI in 2005. The 2004 PCS data include dioxin discharges from one facility, Tesoro in Martinez, CA. EPA reviewed the dioxin and dioxin-like compound discharges in the TRI and PCS databases for the following four facilities, with newly reported, increased, and/or high TWPE associated with discharges of dioxin and dioxin-like compounds:

- Chevron – Richmond, CA;
- Hovensa LLC – Christiansted, VI;
- Tesoro – Anacortes, WA; and
- Tesoro – Martinez, CA.

For discharges reported to TRI, as with the previous detailed and preliminary study, new or increased dioxin and dioxin-like compound discharges are based on estimates rather than wastewater monitoring data. The dioxin and dioxin-like discharges in the *PCSLoads2004_v3* database from the Tesoro refinery in Martinez, CA, are from stormwater sources, not petroleum refining processes, and are being investigated by the San Francisco Region Water Quality Control Board (SF RWQCB). In the following subsections, EPA discusses its findings on the four facilities listed above.

9.4.1 Dioxin and Dioxin-Like Compounds Discharges for Chevron — Richmond, CA

The dioxin and dioxin-like compound discharges from Chevron Products, in Richmond, CA, contribute approximately 140,000 TWPE to TRI 2004 and 120,000 TWPE to TRI 2005. EPA contacted Chevron, which estimated discharges of dioxin and dioxin-like compounds based on semi-annual analysis of its effluent discharge. Table 9-6 presents the concentrations of the dioxin and dioxin-like compounds that were detected, with the lower calibration limit (LCL), for the 2003 and 2004 samples. In the four sampling episodes the following dioxin and dioxin-like congeners were detected above the LCL: octachlorodibenzo-p-dioxin (OCDD): 1,2,3,4,6,7,8-heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF): and octachlorodibenzofuran (OCDF). The facility measured most dioxin and dioxin-like compounds at concentrations below the method detection limit (DL) and LCL. The DL and LCL can change with instrument, analyst, and matrix, and therefore may vary for each sample. The DL and LCL are different from the Method 1613B minimum level (ML). EPA sets the ML as the lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. The ML is always greater than the DL and LCL. Chevron calculated the quantities (g/year) of dioxin and dioxin-like compounds reported to TRI, by using half the DL for sample concentrations measured below the DL and half of the LCL for sample concentrations measured above the DL but below the LCL, based on EPA's TRI guidance (Lizarraga, 2007).

Of the TWPE from dioxin and dioxin-like compounds in the Chevron Richmond wastewater discharges, the detected congeners accounted for 350 of the 37,000 TWPE in *TRIReleases2003* and 69,000 of the 141,000 TWPE in *TRIReleases2004*. In 2004, Chevron detected 2,3,4,7,8-pentachlorodibenzofuran (not detected in 2003), which accounted for most of the increase in TWPE from 2003 to 2004. The TWPE from dioxin and dioxin-like compounds in *TRIReleases2005* decreased compared to the 2004 TWPE; however, the 2005 TWPE is still larger than the 2002 and 2003 TWPEs. Chevron noted that the only process identified where conditions exist for dioxin formation and subsequent capture in the process wastewater is regeneration of two semi-regenerative catalytic reformers' catalyst (Lizarraga, 2007).

Table 9-6. Detected Dioxin and Dioxin-Like Compound Congeners for Chevron

Dioxin and Dioxin-Like Compound Congener	Method 1613B Minimum Level (pg/L)	Sample Date	Concentration (pg/L)	Lower Calibration Limit (pg/L)	Comments
1,2,3,4,6,7,8-HpCDD	50	5/6/03	5.88	23	
		11/10/03	4.17	26	Also detected in the Method Blank
		5/5/04	3.29	23	
		11/5/04	12.3	23	
OCDD	100	5/6/03	24.8	17	Above the LCL
		11/10/03	23.8	26	Also detected in the Method Blank; Above the LCL
		5/5/04	22.6	17	Above the LCL
		11/5/04	31.3	17	Above the LCL
1,2,3,7,8-PeCDF	50	11/5/04	8.34	24	
2,3,4,7,8-PeCDF	50	11/5/04	5.68	21	
1,2,3,4,7,8-HxCDF	50	11/10/03	1.11	19	
		11/5/04	23.2	26	
1,2,3,6,7,8-HxCDF	50	5/6/03	1.76	26	
		11/5/04	12.7	26	
1,2,3,7,8,9-HxCDF	50	11/5/04	3.81	29	
1,2,3,4,6,7,8-HpCDF	50	5/6/03	6.10	28	
		5/5/04	1.12	28	
		11/5/04	34.4	28	Above the LCL
1,2,3,4,7,8,9-HpCDF	50	11/5/04	11.6	26	
OCDF	100	5/6/03	10.0	17	
		5/5/04	4.42	17	
		11/5/04	30.2	17	Above the LCL

Source: Letter to Jan Matuszko of U.S. Environmental Protection Agency, from Tery A. Lizarraga, Chevron Products Company, Richmond, CA (Lizarraga, 2007).
LCL — Lower calibration limit.

9.4.2 Dioxin and Dioxin-Like Compounds Discharges for Hovensa — Christiansted, VI

The dioxin and dioxin-like compound discharges from Hovensa LLC, in Christiansted, VI, contribute approximately 149,000 TWPE (2004) and 180,000 TWPE (2005) in the TRI databases. These values are approximately two orders of magnitude larger than the facility TWPE from *TRIReleases2002*. Hovensa has not analyzed their wastewater for dioxin and dioxin-like compounds.

Hovensa is reporting increased discharges of dioxin and dioxin-like compounds in part because they changed how they estimate dioxin formation (U.S. EPA, 2004). Prior to 2003, Hovensa estimated dioxin and dioxin-like compound emissions to air based on an EPA factor of 136 ng/(bbl/yr × catalytic reforming regeneration events). Hovensa then multiplied the estimated air emissions by a factor of 101.01 to estimate the dioxin and dioxin-like compounds discharges to water. After attending a TRI workshop in 2003 which presented a case study of a petroleum refinery, Hovensa began reporting 0.55 grams of dioxin and dioxin-like compounds for each regeneration event during the year (U.S. EPA, 2004).

The increase in estimated dioxin likely resulted from the change in how discharges are estimated, as well as an increased number of regenerations. Based on the facility's reported 2.2 grams of dioxin and dioxin-like discharges reported to TRI in 2005, EPA assumes that the facility performed four regenerations during 2005 (Antoine, 2007). Similarly, based on the 1.7 grams of dioxin and dioxin-like compounds reported to TRI in 2004, EPA assumes that the facility performed three regenerations during 2005. The increased numbers of regeneration events are likely due to increased production.

9.4.3 Dioxin and Dioxin-Like Compounds Discharges for Tesoro — Anacortes, WA

The dioxin and dioxin-like compound discharges from Tesoro Northwest, in Anacortes, WA, contribute approximately 54,000 TWPE to TRI 2004 and 55,000 TWPE to TRI 2005. These values reflect about a 15 percent increase over the discharges contained in the 2002 and 2003 TRI databases. EPA analyzed and studied dioxin discharge data from this facility as part of its previous detailed study and found the following information (U.S. EPA, 2004):

> *The Tesoro Northwest Refinery (Anacortes, WA) sampled its effluent on two occasions, during batch discharges of treated wastewater generated during the regeneration of catalytic reformer spent catalyst. Each sample was analyzed by two independent analytical laboratories. Tesoro Northwest detected between 6 and 11 dioxin congeners in its final effluent. However, two compounds were present in the corresponding laboratory blank. Several other compounds were detected below the lower calibration limit (LCL). OCDF and 1,2,3,4,6,7,8- HpCDF were detected at about the method minimum level by both laboratories and in both samples. The most toxic dioxin forms (2,3,7,8 -TCDD and 2,3,7,8-TCDF) were not detected in any samples. The refinery has not done an additional study to identify the sources of dioxin in its final effluent. At this point, because the dioxin concentrations in the upstream source (catalytic reformer regeneration wastewaters) are also high, EPA assumes the spent caustic/wash water from catalytic reformer regeneration is the source of the dioxins in the final effluent. These effluent measurements equate to 29.9 to 196 TWPE (low value assumes nondetects equal zero and high value assumes nondetects equal the detection limit).*

EPA believes that the discharges of dioxin and dioxin-like compounds continue to increase due to increases in production, and that the majority of the TWPE reported to TRI is based on values below the LCL and/or minimum level.

9.4.4 Dioxin and Dioxin-Like Compounds Discharges for Tesoro — Martinez, CA

The dioxin and dioxin-like compound discharges from the Tesoro refinery in Martinez, CA, contribute approximately 535,000 TWPE in *PCSLoads2004_v3*. The 2000 and 2002 versions of the *PCSLoads* databases, do not include discharges of dioxin and dioxin-like compounds from Tesoro Martinez (i.e., no discharges greater than zero). Tesoro Martinez reports monitors TCDD equivalents rather than dioxin and dioxin-like compounds. Table 9-7 presents the monitoring data for 2004.

Table 9-7. TCDD Equivalents Monitored in 2004

Sample Date	Concentration Reported (pg/L)
7/31/2004	140.0 [a]

Source: PCSLoadCalculator2004_AK_DC.
a — The Method 1613b method limit for 2,3,7,8-TCDD is 10 pg/L.

EPA analyzed and studied dioxin discharge data from this facility as part of its previous detailed study (U.S. EPA, 2004):

> *In 1997, the Tesoro (Martinez, CA) refinery completed an extensive study to find the source of dioxin in its wastewaters. The study determined that stormwater is the largest source of dioxin in the final effluent (50 percent) with the coke pond and clean canal forebay as the second largest (45 percent). The refinery reported that the wastewater treatment plant (i.e., treated process wastewater) contributed 2 percent of the dioxins in the final effluent. The facility collected and analyzed two samples of fully treated process wastewater for this study. The analytical results were 0.000 pg/L TCDD-equivalents and 0.012 pg/L TCDD-equivalents. These concentrations equate to 12.8 lb-equivalents. In comparison, the calculated TCDD-equivalents of the concentrations detected in the final effluent in 2000 were 0.00028, 0.30, and 0.09 pg/L.*

The majority of the refinery's discharges of dioxin and dioxin-like compounds result from stormwater because the soil at the refinery is contaminated with dioxin and dioxin-like compounds. The SF RWQCB is working with Tesoro to reduce dioxin discharges to the San Francisco Bay (SF RWQCB, 2005).

EPA believes that because the discharges of dioxin and dioxin-like compounds are from stormwater, not a petroleum refining process, and the SF RWQCB are working with Tesoro, the discharges do not warrant additional review.

9.5 Petroleum Refining Category Polycyclic Aromatic Compounds Discharges

PACs are the second largest contributor to the TWPE discharges from TRI 2004 and 2005 for the Petroleum Refining Category. The PAC discharges contained in PCS are reported as individual compounds, and therefore, are not a combined category of pollutants. None of the individual PACs were among the top pollutants discharged from petroleum refineries in PCS 2004. EPA examined reported PAC discharges from petroleum refining facilities extensively for its detailed and previous preliminary studies. From these previous studies, EPA concluded that (U.S. EPA, 2004):

Petroleum refineries report PACs discharges to TRI; however, these discharges are either based on one-half the detection limit multiplied by the flow or are estimated using emission factors. Out of 39 dischargers that reported PACs, EPA has verified only three petroleum refineries that measured PACs in their final effluent. Of these, two discharge indirectly to POTWs and receive additional treatment prior to discharge to surface waters and the third reported PAC discharges representing 81 TWPE. Therefore, this is little evidence that PACs are being discharged to surface waters in concentrations above the detection limit.

Table 9-9, at the end of this section, lists the PACs reported to TRI from 2002 to 2005. The PACs in the TRI databases increased from 26,000 TWPE in 2004 to 34,000 TWPE in 2005; however, the TWPE in *TRIReleases2005* is still lower than the TWPE from *TRIReleases2002*. Thirty-eight facilities reported PAC discharges to TRI in 2004 and 39 facilities reported PAC discharges to TRI in 2005. Using the 2004 and 2005 TRI-reported data, EPA did not identify any additional petroleum refineries that measured PACs in their final effluent; therefore, EPA draws the same conclusion that was reached in the previous studies.

9.6 Petroleum Refining Category Conclusions

During the 2008 Annual Review, EPA did not obtain any information to change the conclusions that have previously been made regarding the wastewater discharges from the petroleum refineries. Therefore, the conclusions of the petroleum refining category review are as follows:

- EPA previously determined that dioxin and dioxin-like compounds are produced during catalytic reforming and catalyst regeneration operations at petroleum refineries. Most facilities never detected dioxin and dioxin-like compounds in their process wastewater effluent.

  Of the 164 identified U.S. petroleum refineries (SIC code 2911) in TRI 2004, 17 report discharges of dioxin and dioxin-like compounds to TRI in 2004 and 15 report discharge of dioxin and dioxin-like compounds to TRI in 2005. Of the 17 refineries reporting discharges in 2004 and 2005, only seven of these refineries reported dioxin discharges based on analytical measurements (i.e., see the "Basis of Estimate" field noted as "M" in Table 9-8). Only three of these facilities detected dioxin and dioxin-like compounds above the Method 1613B minimum level and two of these facilities measured dioxin at the point immediately following catalytic regeneration and prior to wastewater treatment.

- In *PCSLoads2004_v3*, one facility had measurable discharges of dioxin and dioxin-like compounds: the Tesoro refinery in Martinez, CA. The majority of the dioxin discharge, in terms of TWPE, results from stormwater runoff from an area with contaminated soil. The facility's dioxin discharges are not representative of petroleum refining process wastewater. In addition, the SF RWQCB is working with the facility to reduce the dioxin discharged from this facility.

- Petroleum refineries report PAC discharges to TRI; however, these discharges are either based on half the detection limit multiplied by the flow or estimated using emission factors. Out of 39 dischargers that reported PACs to TRI in 2005, EPA has verified only three petroleum refineries that measured PACs in their final effluent. Of these, two discharge indirectly to POTWs and receive additional treatment prior to discharge to surface waters and the third reported PAC discharges representing 81 TWPE. Therefore, there is little evidence that PACs are being discharged to surface waters in concentrations above the detection limit.

- EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with “(3)” in the “Findings” column in Table V-1 in the accompanying Federal Register notice that presents the 2008 annual review of effluent guidelines and pretreatment standards).

Table 9-8. Dioxin and Dioxin-Like Discharges from Petroleum Refineries Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate
00851-HSSLV-LIMET	Hovensa LLC	Christiansted, VI	2.2	180,442	E	1.7	148,653	C	1.1	85,167	C	0.034	2,342	C
94802-CHVRN-841ST	Chevron Products Co. Richmond Refinery (a,b)	Richmond, CA	0.94	121,521	M	1.35	141,106	O	0.68	36,798	O	0.76	19,229	O
98221-SHLLL-WESTM	Tesoro Refining & Marketing Co	Anacortes, WA	1.94	55,248	M	1.95	54,406	M	1.7	47,382	M	1.6	45,504	M
70669-CNCLK-OLDSP	Conocophillips Lake Charles Refinery	Westlake, LA	0.539	48,580	O	0.54	48,580	O	0.54	48,580	O	0.54	48,580	O
43616-SHLCM-4001C	Bp Products North America Inc Toledo Refinery	Oregon, OH	0.331	47,084	O	0.34	47,795	M	0.38	54,054	M	0.36	51,209	M
90245-CHVRN-324WE	Chevron Products Co. Div Of Chevron USA Inc.	El Segundo, CA	0.158	16,221	M	0.2	20,533	M	0.34	35,317	M	0.11	11,191	M
74603-CNCPN-1000S	Conocophillips Ponca City Refinery	Ponca City, OK	0.141	11,601	O	0.28	25,485	O	0.28	21,901	O	0.44	31,071	O
77536-DRPRK-5900H	Shell Oil Co - Deer Park Refining LP	Deer Park, TX	0.114	10,850	M	0.16	15,477	M	0.15	14,581	O	NR	NR	NR
80022-CNCDN-5801B	Suncor Energy Commerce City Refinery	Commerce City, CO	0.111	9,104	M	0.037	3,333	M	0.074	5,729	E	0.095	6,640	E
08066-MBLLC-BILLI	Valero Refining Co New Jersey	Paulsboro, NJ	0.0879	7,209	O	0.18	15,838	O	0.088	6,813	O	0.088	6,151	O
39567-CHVRN-POBOX	Chevron Products Co Pascagoula Refinery	Pascagoula, MS	0.099	4,234	O	0.12	5,217	O	0.099	4,234	O	0.086	3,678	O
62454-MRTHN-MARAT	Marathon Ashland Petroleum LLC Illinois Refining Div	Robinson, IL	0.0404	3,314	O	0.04	3,604	O	0.0404	3,128	O	0.04	2,796	O
00654-PHLPS-PHILI	Chevron Phillips Chemical Puerto Rico Core Inc.	Guayama, PR	0.0054	443	E	0.0035	318	E	0.00596	461	E	NR	NR	NR
70602-CTGPT-HIGHW	Citgo Petroleum Corp	Westlake, LA	0.00256	210	E	0.0026	231	E	0.0026	199	E	0.0026	179	E
19706-TXCDL-2000W	Premcor Refining Group Inc	Delaware City, DE	0.0000965	2	O	0.022	559	O	0.022	559	O	NR	NR	NR
46394-MCLC - 2815I	Bp Products North America Whiting Business Unit	Whiting, IN	NR	NR	NR	0.000011	1.8	O	NR	NR	NR	NR	NR	NR

Table 9-8. Dioxin and Dioxin-Like Discharges from Petroleum Refineries Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate	Grams Released	TWPE	Basis of Estimate
60434-MBLJL-INTER	ExxonMobil Oil Corp Joliet Refinery	Channahon, IL	NR	NR	NR	NR	NR	NR	0.0007	64	O	0.43	39,602	O
99611-TSRLS-MILE2	Tesoro Alaska - Kenai Refinery (a,b)	Kenai, AK	NR	NR	NR	NR	NR	NR	0.0006	46	M	NR	NR	NR
07036-XXN - 1400P	Conocophillips Co. Bayway Refinery	Linden, NJ	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.25	5,229	M
77590-MRTHN-FOOTO	Marathon Ashland Petroleum L.L.C.	Texas City, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0044	304	O
Indirect														
90748-NCLLS-1660W	Conocophillips Co La Refinery Wilmington Plant (a)	Wilmington, CA	NR	NR	NR	0.27	27,738	M	0.088	9,015	M	0.28	22,320	M

Source: *TRIReleases2005_v2*; *TRIReleases2004_v3*; *TRIReleases2003_v2*; *TRIReleases2002_v4*; Memorandum: Revisions to TWFs for Dioxin and its Congeners and Recalculated TWPEs for OCPSF and Petroleum Refining (Zipf, 2004).
a — Dioxin and dioxin-like compounds were detected above the Method 1613B minimum level.
b — Dioxin and dioxin-like compounds were sampled after the catalytic regeneration and prior to the wastewater treatment plant.
NR — Not reported.
For indirect discharges, the mass shown is the mass transferred to the POTW that is ultimately discharged to surface waters, accounting for an estimated 83% removal of dioxin and dioxin-like compounds by the POTW.
The TWPEs in this table were calculated using the 2006 TWFs (the 2006 dioxin and dioxin-like compound TWFs did not change from the August or December 2004 TWFs).
Refineries reported basis of estimate in TRI as: M — Monitoring data/measurements; C — Mass balance calculations; E — Published emission factors; and O — Other approaches (e.g., engineering calculations).

9.7 Petroleum Refining Category References

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Table 9-9. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
96707CHVRN91480	Chevron Products Co - Hawaii Refinery	Kapolei, HI	270.0	6862.6	M	270.0	6863.0	M	261	6629.0	M	277	7041.0	M
44711SHLND2408G	Marathon Petroleum Co LLC Ohio Refining Div	Canton, OH	149.0	3787.1	M	NR	NR	NR	NR	NR	NR	NR	NR	NR
90245CHVRN324WE	Chevron Products Co Div of Chevron USA Inc	El Segundo, CA	137.4	3492.3	M	113.0	2882.0	M	117	2974.0	M	287	7287.0	M
39567CHVRNPOBOX	Chevron Products Co Pascagoula Refinery	Pascagoula, MS	126.1	3205.1	O	115.0	2923.0	O	115	2923.0	O	110	2796.0	O
55071SHLND100WT	Marathon Petroleum Co LLC Saint Paul Park Refiner	Saint Paul Park, MN	95.7	2431.1	M	24.0	616.0	M	NR	NR	NR	NR	NR	NR
70075MRPHY2500E	Murphy Oil USA Inc Meraux Refinery	Meraux, LA	66.0	1677.5	O	NR	NR	NR	NR	NR	NR	NR	NR	NR
84116CHVRN2351N	Chevron Products Co Salt Lake Refinery	Salt Lake City, UT	60.0	1525.0	M	59.0	1500.0	M	59	1500.0	M	59	1500.0	M
70037LLNCRHIGHW	ConocoPhillips Co - Alliance Refinery	Belle Chasse, LA	43.8	1114.3	M	49.0	1233.0	M	34.9	887	M	31	788	M
70669CNCLKOLDSP	ConocoPhillips Co Lake Charles Refinery	Westlake, LA	41.0	1042.1	O	43.0	1093.0	O	51	1296.0	O	31	788	O
79008PHLLPSTATE	ConocoPhillips Co	Borger, TX	39.0	991.3	M	43.0	1093.0	M	NR	NR	NR	NR	NR	NR
77590MRTHNFOOTO	Marathon Petroleum Co LLC	Texas City, TX	34.6	879.4	M	29.0	742.0	M	30	768	M	93	2369	M
60439NCLCR135TH	PDV Midwest Refining LLC Lemont Refinery	Lemont, IL	32.1	814.9	M	NR	NR	NR	NR	NR	NR	NR	NR	NR
62454MRTHNMARAT	Marathon Ashland Petroleum LLC Illinois Refining Div	Robinson, IL	24.0	610.0	O	28.0	712.0	O	1	25	O	21	534	O
70750HLLPTHWY10	Valero Refining Co Louisiana	Krotz Springs, LA	23.0	584.6	O	22.0	567.0	O	19	483	O	19	483	O
80022CNCDN5801B	Suncor Energy Commerce City Refinery	Commerce City, CO	19.0	482.9	O	28.0	712.0	O	53	1347.0	O	9	229	O
94802CHVRN841ST	Chevron Products Co Richmond Refinery	Richmond, CA	19.0	482.9	M	19.3	491.0	M	15	376	M	14	351	M
99611TSRLSMILE2	Tesoro Alaska - Kenai Refinery	Kenai, AK	19.0	482.9	O	18.9	480.0	O	19	480	O	19	480	O

Table 9-9. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
62084SHLLLRTE11	ConocoPhillips Co Wood River Refinery	Roxana, IL	11.0	279.6	O	11.0	280.0	O	10	254	O	8.9	226	O
78410KCHRFSUNTI	Flint Hills Resources LP - West Plant	Corpus Christi, TX	10.6	269.4	M	16.0	412.0	M	8	203	M	1771.0	45014.0	M
70047TRNSM14902	Valero Refining New Orleans LLC	New Sarpy, LA	9.0	228.8	O	9.0	229.0	O	9	229	O	9	229	O
74603CNCPN1000S	ConocoPhillips Co Ponca City Refinery	Ponca City, OK	8.0	203.3	O	8.0	203.0	O	8	203	O	8	203	O
70051MRTHNHWY61	Marathon Petroleum Corp Garyville	Garyville, LA	5.0	127.1	C	5.0	127.0	C	5	127	C	NR	NR	NR
46394MCLC 2815I	BP Products North America Whiting	Whiting, IN	3.6	91.5	O	1.0	25.0	O	1	25	O	NR	NR	NR
19706TXCDL2000W	Premcor Refining Group Inc	Delaware City, DE	3.4	86.4	O	4.0	102.0	O	3.2	81	O	1.4	36	O
77017LYNDL12000	Lyondell-Citgo Refining LP	Houston, TX	3.0	76.3	M	0.0	0.0	M	NR	NR	NR	17	429	M
93420NCLSN2555W	ConocoPhillips Co Santa Maria Refinery	Arroyo Grande, CA	2.0	50.8	O	2.0	51.0	O	2	51	O	0.8	20	O
70079MTVNR15536	Motiva Enterprises LLC Convent Refinery	Norco, LA	1.4	35.6	O	NR	NR	NR	NR	NR	NR	NR	NR	NR
98221PGTSN600ST	Shell Oil Products US Puget Sound Refinery	Anacortes, WA	1.0	25.4	O	1.0	25.0	O	0.9	23	O	1.08	27	O
08861CHVRN1200S	Chevron Products Co	Perth Amboy, NJ	0.6	15.3	O	0.9	23.0	O	0.6	15	O	0.8	20	O
94553TSCCRAVONR	Tesoro Refining and Marketing Co	Martinez, CA	0.6	15.3	M	0.5	13.0	M	0.6	15	M	1.3	33	M
77592TXSCTLOOP1	Valero Refining - Texas LP	Texas City, TX	0.5	12.7	M	0.2	5.0	M	NR	NR	NR	69	1754.0	M
78408STHWS1700N	Flint Hills Resources LP - East Plant	Corpus Christi, TX	0.5	12.7	M	0.6	15.0	M	1	25	M	NR	NR	NR
19061BPLCMPOSTR	ConocoPhillips Co. Trainer Refinery	Trainer, PA	0.1	3.6	O	0.2	5.0	O	0.2	5	O	0.41	10	O
90749RCPRD1801E	BP West Coast Products LLC Carson	Carson, CA	0.1	2.5	M	NR	NR	NR	NR	NR	NR	NR	NR	NR
42501THSMR501RE	Somerset Refinery Inc	Somerset, KY	NR	NR	NR	NR	NR	NR	0.08	2	M	0.01	0	M
59101CNCBL401SO	ConocoPhillips Co Billings Refinery	Billings, MT	NR	NR	NR	NR	NR	NR	0.4	10	M	8	203	M
67042TXCRF1401S	Frontier El Dorado Refining Co	El Dorado, KS	NR	NR	NR	0.7	18.0	O	0.7	18	O	1	25	O

Table 9-9. PAC Discharges from Petroleum Refineries Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate	Pounds Released	TWPE	Basis of Estimate
70143TNNCL500WE	Chalmette Refining Co	Chalmette, LA	NR	NR	NR	1.0	25.0	O	11	280	O	NR	NR	NR
70606CLCSRWESTE	Calcasieu Refining Co	Lake Charles, LA	NR	NR	NR	2.0	51.0	O	182	4626.0	O	191	4855.0	O
70723TXCRFFOOTO	Motiva Enterprises LLC Convent Refinery	Convent, LA	NR	NR	NR	NR	NR	NR	2	51	O	2.3	59	O
73098KRRMC906SO	Wynnewood Refining Co	Wynnewood, OK	NR	NR	NR	10.0	254.0	O	10	254	O	10	254	O
74107SNCLR902W2	Sinclair Oil Corp Tulsa Refinery	Tulsa, OK	NR	NR	NR	NR	NR	NR	18	450	M	17	437	M
82701WYMNG740WE	Wyoming Refining Co	Newcastle, WY	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.06	27	E
94572NCLSNOLDHI	ConocoPhillips San Francisco Refinery	Rodeo, CA	NR	NR	NR	NR	NR	NR	NR	NR	NR	8	203	M
Indirect														
48217MRTHN1300S	Marathon Petroleum Co LLC Michigan Refining Div	Detroit, MI	94.0	175.8	M	98.0	184.0	M	92	172	M	93	174	M
79905LPSRF6500T	Western Refining Co El Paso Refinery	El Paso, TX	54.0	101.0	O	51.0	95.0	O	55	102	O	24	45	O
90744TXCRF2101E	Shell Oil Products US Los Angeles Refinery	Wilmington, CA	7.3	13.7	M	7.6	14.0	M	13	24	M	43	80	M
93307KRNLRRR677	Kern Oil Refining Co	Bakersfield, CA	0.3	0.5	O	0.3	1.0	O	0.28	1	M	0.28	1	M
36611BLCHRVIADU	Gulf Atlantic Operations LLC	Chickasaw, AL	0.0	0.0	M	0.0	0.0	C	0.009	0	C	NR	NR	NR
77506CRWNC111RE	Crown Central Petroleum Corp Houston Refinery	Pasadena, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	4.6	117	O
77017LYNDL12000	Lyondell-Citgo Refining LP	Houston, TX	NR	NR	NR	NR	NR	NR	155	3928.0	O	146	3718.0	M
79905CHVRN6501T	Chevron El Paso Refinery	El Paso, TX	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.8	45	O

Source: *TRIReleases2005_v2; TRIReleases2004_v3; TRIReleases2003_v2*; *TRIReleases2002_v4*.
NR — Not reported.
For indirect dischargers, the mass shown is the mass transferred to the POTW that is ultimately discharged to surface waters, accounting for an estimated 92.64% removal of PACs by the POTW.
Refineries reported basis of estimate in TRI as: M — Monitoring data/measurements; C — Mass balance calculations; E — Published emission factors; and O — Other approaches (e.g., engineering calculations).
The 2002 TWPE was calculated using the December 2004 TWFs.
The 2003 TWPE was calculated using the April 2006 TWFs.

10.0 PULP, PAPER, AND PAPERBOARD (40 CFR PART 430)

EPA selected the Pulp, Paper, and Paperboard (Pulp and Paper) Category (40 CFR Part 430) for preliminary review because it continues to rank high, in terms of TWPE, in the point source category rankings (see Tables 5-3 and 5-4 for the point source category rankings). EPA conducted a detailed study of this industry in support of the 2006 Final ELG Plan (71 FR 76644). EPA has also reviewed discharges from pulp and paper mills as part of its annual reviews since 2004. Each year, including this year of review, EPA has concluded that wastewater from pulp and paper mills does not warrant a more detailed review at this time.

10.1 Pulp, Paper, and Paperboard Category Background

This subsection provides background on the Pulp and Paper Category including a brief profile of the industry and background on 40 CFR Part 430.

10.1.1 Pulp, Paper, and Paperboard Industry Profile

The pulp and paper industry includes facilities that manufacture pulp from wood and other fibers, produce paper and paperboard from pulp, or convert it from paper products. Facilities in the following three SIC codes could perform operations covered by existing regulations for the Pulp and Paper Category:

- 2611: Pulp Mills;
- 2621: Paper Mills; and
- 2631: Paperboard Mills.

A facility may be identified under more than one SIC code, such as integrated facilities that manufacture pulp on site for the production of paper products. In addition, EPA is considering including operations from five other SIC codes as potential new subcategories of the Pulp and Paper Category.[16]

Table 10-1 presents the number of facilities in the SIC codes that compose the pulp and paper industry. Because the U.S. Economic Census reports data by NAICS code, and TRI and PCS report data by SIC code, EPA reclassified the 2002 U.S. Economic Census by the equivalent SIC code.

Pulp and paper manufacturers discharge wastewater directly to surface water as well as to POTWs. Table 10-2 presents the types of discharges reported by facilities in the 2004 and 2005 TRI databases. The majority of pulp and paper manufacturers reporting to TRI reported discharging directly. The majority of facilities reporting to TRI in SIC codes classified as potential new subcategories reported no water discharges.

[16] EPA reviews industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the SIC codes 2653, 2655, 2656, 2657, 2671, 2672, 2674, and 2679 (listed in Table 10-1) are similar to those of the Pulp and Paper Category (U.S. EPA, 2004). The tables in this section include discharge information from the potential new subcategories; however, these facilities contribute negligible amounts of TWPE. Consistent with the conclusions drawn during the 2004 detailed study (U.S. EPA, 2004) and 2006 review (U.S. EPA, 2006a), EPA found that large numbers of these facilities discharge no wastewater and only a small number of facilities discharge TWPE greater than zero.

Table 10-1. Number of Facilities in Pulp and Paper SIC Codes

SIC Code	2002 U.S. Economic Census	2004 PCS [a]	2004 TRI [b]	2005 TRI [b]
2611: Pulp Mills	32	84	73	73
2621: Paper Mills	329	133	140	140
2631: Paperboard Mills	199	55	96	96
Pulp and Paper Category Total [c]	**560**	**272**	**309**	**309**
Potential New Subcategories				
2653: Corrugated and Solid Fiber Boxes	1,719	7	18	16
2655: Fiber Cans, Tubes, Drums, and Similar Products	261	2	1	0
2656: Sanitary Food Containers, Except Folding	72	3	2	2
2657: Folding Paperboard Boxes, Including Sanitary	490	1	5	2
2671: Packaging Paper and Plastics Film, Coated and Laminated	391	7	44	44
2672: Coated and Laminated Paper, NEC	541	0	87	79
2674: Uncoated Paper and Multiwall Bags	123	0	3	2
2679: Converted Paper and Paperboard Products, NEC	869	4	25	27
Potential New Subcategories Total	**4,466**	**24**	**185**	**172**

Source: U.S. Economic Census, 2002 (U.S. Census, 2002); *PCSLoads2004_v3; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Major and minor dischargers.
b — Releases to any media.
c — Excludes the potential new subcategories.
NEC — Not elsewhere classified.

Table 10-2. Pulp and Paper Category Facilities by Type of Discharge Reported in TRI 2004 and 2005

SIC Code	TRI 2004				TRI 2005			
	Reported Only Direct Discharges	**Reported Only Indirect Discharges**	**Reported Both Direct and Indirect Discharges**	**Reported No Water Discharges [a]**	**Reported Only Direct Discharges**	**Reported Only Indirect Discharges**	**Reported Both Direct and Indirect Discharges**	**Reported No Water Discharges [a]**
2611: Pulp Mills	65	4	1	3	66	3	0	4
2621: Paper Mills	78	22	7	33	74	18	8	40
2631: Paperboard Mills	47	27	3	19	50	30	2	14
2653: Corrugated and Solid Fiber Boxes	0	1	0	17	0	2	0	14
2655: Fiber Cans, Tubes, Drums, and Similar Products	0	0	0	0	0	0	0	0
2656: Sanitary Food Containers, Except Folding	0	2	0	0	0	1	1	0
2657: Folding Paperboard Boxes, Including Sanitary	0	2	0	3	0	1	0	1
2671: Packaging Paper and Plastic Film, Coated and Laminated	0	1	0	43	0	1	0	43
2672: Coated and Laminated Paper, Not Elsewhere	1	17	0	69	1	15	0	63
2674: Unciated Paper and Multiwall Bags	0	2	0	1	0	2	0	0
2679: Converted Paper and Paperboard Products, Not Elsewhere Classified	0	3	0	22	0	2	0	25
Potential New Subcategories Total	**191**	**81**	**11**	**210**	**191**	**75**	**11**	**204**

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Facilities reporting no wastewater discharges may be discharging chemicals to water that do not meet TRI reporting thresholds. TRI thresholds are based on the amount of chemical used or manufactured at the site.

10.1.2 40 CFR Part 430

Between 1974 and 1986, EPA promulgated ELGs for the Pulp and Paper Category. For these regulations, EPA divided the industry into 25 subcategories, based on the products made and processes used at the mills.

A 1988 legal suit obligated EPA to address discharges of polychlorinated dibenzo-(p)-dioxins and polychlorinated dibenzofurans[17] from 104 bleaching pulp mills, including nine dissolving pulp mills. While meeting that obligation, EPA also reviewed ELGs for the entire Pulp and Paper Category. As part of that review, EPA reorganized the category into 12 subcategories. Although the Pulp and Paper Category regulations apply to all facilities in SIC codes 2611, 2621, and 2631, the 12 subcategories are organized by process used and product produced and do not correspond to SIC codes.

During its response to the 1988 legal suit, EPA decided to review and revise the Pulp and Paper Category regulations in three phases. Table 10-3 presents these three phases and the subcategories EPA planned to address in each phase.

In revising the Pulp and Paper Category regulations, EPA first addressed two subcategories, Subpart B (Bleached Papergrade Kraft and Soda) and Subpart E (Papergrade Sulfite), because these subparts applied to the majority of the 104 mills identified in the 1988 suit.[18] Subparts B and E became known as Phase I; EPA promulgated revised ELGs for these subparts on April 15, 1998 (63 FR 18504). EPA promulgated the Phase I ELGs at the same time as it promulgated National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for kraft and sulfite pulp mills. Because these water and air regulations were developed, analyzed, and promulgated jointly, they are called the Cluster Rules.

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[17] Polychlorinated dibenzo-p-dioxins (CDDs) and polychlorinated dibenzofurans (CDFs) constitute a group of persistent, bioaccumulative, and toxic chemicals. Facilities are required to report to EPA's TRI the total mass of 17 of these CDDs and CDFs released to the environment every year. In this report, EPA uses the term "dioxin and dioxin-like compounds" to refer to the total mass of the 17 CDDs and CDFs, as reported to TRI. For discharges from certain mills in the Pulp and Paper Category, EPA promulgated ELGs for two specific dioxins: 2,3,7,8-tetrachlorodibenzo-p-dioxin and 2,3,7,8-tetrachlorodibenzofuran. In this report, these compounds are referred to as TCDD and TCDF, respectively. See Section 3.2 of the detailed study report (71 FR 76644) for a discussion of dioxin and dioxin-like compounds.

[18] The remainder of the 104 mills identified in the 1988 suit were in Subpart A, Dissolving Kraft, and Subpart D, Dissolving Sulfite. These two subparts became known as Phase III.

Table 10-3. Relationship Between Pulp and Paper Regulatory Phases and Subcategories

Phase	Subpart	Subcategory
I	B	Bleached Papergrade Kraft and Soda
	E	Papergrade Sulfite
II	C	Unbleached Kraft
	F	Semi-Chemical
	G	Groundwood, Chemi-Mechanical, and Chemi-Thermo-Mechanical
	H	Non-Wood Chemical Pulp
	I	Secondary Fiber Deink
	J	Secondary Fiber Non-Deink
	K	Fine and Lightweight Papers from Purchased Pulp
	L	Tissue, Filter, Non-Woven and Paperboard from Purchased Pulp
III	A	Dissolving Kraft
	D	Dissolving Sulfite

Note: EPA promulgated revised ELGs for Phase I, known as the Cluster Rules on April 15, 1998. EPA has not promulgated revised ELGs for Phase II or Phase III.

Eight subcategories are known as Phase II and are listed in Table 10-3. EPA has not revised the ELGs for these subcategories, which were promulgated between 1974 and 1986.

Phase III affected the two dissolving pulp subcategories (Subpart A, Dissolving Kraft, and Subpart D, Dissolving Sulfite). EPA did not promulgate revised ELGs addressing TCDD and TCDF for Phase III in 1998, because the affected companies were undertaking a multiyear laboratory study and mill trial to develop alternative bleaching technologies. EPA anticipated that final ELGs would be based on different technologies than those that served as the basis for the Phase I regulations. As of August 2006, there were only three operating mills in these two subcategories. As part of its 2004 and 2006 Effluent Guidelines Program Plans, EPA determined that rather than promulgate revised ELGs for Phase III mills (see 58 FR 44078, December 17, 1993), EPA would support NPDES permit writers individually in developing permit-specific effluent limitations to control TCDD and TCDF releases from these three mills (see 69 FR 53716, September 2, 2004; 71 FR 76651–76652, December 21, 2006). In 2007, EPA developed and distributed to Georgia and Florida state regulatory agencies a technical document for NPDES permit writers in order to support the development of effluent limitations for facilities in the Dissolving Kraft (Subpart A) and Dissolving Sulfite (Subpart D) subcategories of the Pulp and Paper Category (40 CFR Part 430) (see EPA-HQ-OW-2006-0771-0774). In future annual reviews, EPA intends to re-evaluate each category based on the information available at the time and to evaluate the effectiveness of this BPJ permit-based support.

10.2 Pulp, Paper, and Paperboard Category 2005 Through 2008 Screening-Level Reviews

Over the years of EPA review, from 2004 through 2008, the TWPE associated with wastewater discharges from pulp and paper mills has decreased. Table 10-4 shows the screening-level results for the pulp and paper industry from the 2002 through 2005 TRI and PCS databases. The TRI TWPE increased from 2002 to 2003 and then decreased significantly from 2003 to 2004. The PCS TWPE has decreased by 88 percent from 2002 to 2004.

Table 10-4. Pulp, Paper, and Paperboard Screening-Level Results

Year of Review	Year of Pollutant Discharge	Pulp and Paper Category [a]		Potential New Subcategories for the Pulp and Paper Category [d]	
		TRI TWPE [b]	PCS TWPE [c]	TRI TWPE [b]	PCS TWPE [c]
2005	2002	1,950,000	1,540,000	563	0
2006	2003	2,880,000	NA	865	NA
2007	2004	669,000	165,000	73.3	0
2008	2005	639,000	NA	39.2	NA

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2; PCSLoads2004_v3; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Includes TWPE from the potential new subcategories.
b — Direct and indirect water releases only.
c — Major and minor dischargers.
d — EPA reviews industries with SIC codes not clearly subject to existing ELGs. EPA concluded that the processes, operations, wastewaters, and pollutants of facilities in the SIC codes 2653, 2655, 2656, 2657, 2671, 2672, 2674, and 2679 (listed in Table 9-1) are similar to those of the Pulp and Paper Category (U.S. EPA, 2006b). The tables in this section include discharge information from the potential new subcategories; however, these facilities contribute negligible amounts of TWPE.
NA — Not applicable. EPA did not evaluate PCS data for 2003 and 2005.

10.3 Pulp and Paper Category 2004 Through 2008 Pollutants of Concern

Table 10-5 shows the five pollutants with the highest TWPE in *TRIReleases2004*, *TRIReleases2005*, and *PCSLoads2004*. For comparison purposes, Table 10-6 provides similar information from the 2006 Final ELG Plan (71 FR 76644) using *TRIReleases2002*, *TRIReleases2003*, and *PCSLoads2002*. With the exception of dioxin and dioxin-like compounds, the TWPE from the top pollutants in *TRIReleases* and *PCSLoads* from 2002 through 2005 and their relative contribution to the category's total TWPE generally remain the same. The Pulp and Paper Final Detailed Study Report discusses EPA's conclusions about discharges of manganese and aluminum (U.S. EPA, 2006a).

Table 10-5. 2008 Review: Pulp and Paper Category Pollutants of Concern [a]

Pollutant	PCS 2004 [b]			TRI 2004 [c]			TRI 2005 [c]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Manganese And Manganese Compounds	Pollutants are not in the top five PCS 2004 reported pollutants.			117	4,490,000	316,000	117	4,470,000	315,000
Dioxin And Dioxin-Like Compounds	1	0.011	8,640	64	0.219	178,000	57	0.181	147,000
Aluminum	26	993,000	64,300	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Chlorine	22	55,200	28,100						
Sulfide	1	5,020	14,100						
Iron	12	1,380,000	7,740						
Lead And Lead Compounds	Pollutants are not in the top five PCS 2004 reported pollutants.			189	27,500	61,600	196	27,300	61,200
Polycyclic Aromatic Compounds				77	1,270	42,600	76	1,190	40,100
Zinc And Zinc Compounds				83	346,000	16,200	88	371,000	17,400
Pulp, Paper, and Paperboard Category Total	**150 [d]**	**2,340,000,000**	**165,000**	**282 [d]**	**23,200,000**	**669,000**	**276 [d]**	**22,500,000**	**639,000**

Source: *PCSLoads2004_v3*; *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — This table presents the top five pollutants composing the category TWPE, including the potential new subcategory SIC codes. However, the potential new subcategories contribute negligible pounds and TWPE.
b — Discharges include only major dischargers.
c — Discharges include transfers to POTWs and account for POTW removals.
d — Number of facilities reporting TWPE greater than zero.

Table 10-6. 2006 Review: Pulp and Paper Category Pollutants of Concern [a]

Pollutant	2002 PCS [b]			2002 TRI [c]			2003 TRI [c]		
	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE	Number of Facilities Reporting Pollutant	Total Pounds Released	TWPE
Dioxin and Dioxin-like Compounds	1	0.002	1,366,677	61	0.145	1,469,101	60	0.216	2,387,924
Aluminum	29	1,425,308	92,205	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Chlorine	25	47,105	23,984	12	34,442	17,537	11	28,555	14,539
Sulfide	1	2,442	6,841	Pollutants are not in the top five TRI 2002 reported pollutants.			Pollutants are not in the top five TRI 2003 reported pollutants.		
Mercury	15	58	6,838	74	62	7,251	77	61	7,196
Copper	44	8,657	5,496	Pollutants are not in the top five TRI 2002 reported pollutants.			11	4,590	2,914
Manganese and Manganese Compounds	Pollutants are not in the top five PCS 2002 reported pollutants.			112	4,312,307	303,729	113	4,317,774	304,114
Lead and Lead Compounds				186	29,571	66,240	180	25,449	57,006
Polycyclic Aromatic Compounds				79	1,341	45,146	76	1,313	44,190
Zinc				72	309,694	14,520	Pollutants are not in the top five TRI 2003 reported pollutants.		
Pulp and Paper Category Total	**181 [d]**	**3,980,000,000**	**1,537,056**	**293 [d]**	**19,399,504**	**1,952,130**	**281 [d]**	**21,105,926**	**2,879,522**

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2*.
a — This table presents the top five pollutants composing the category TWPE, including the potential new subcategory SIC codes. However, the potential new subcategories contribute negligible pounds and TWPE.
b — Discharges include only major dischargers.
c — Discharges include transfers to POTWs and account for POTW removals.
d — Number of facilities reporting TWPE greater than zero.

10.4 Pulp and Paper Category Dioxin and Dioxin-Like Discharges

The decrease in the overall TWPE for the Pulp and Paper Category is due to a recent decrease in reported discharges of the most toxic of the dioxin and dioxin-like congeners. However, according to PCS and TRI data, the total quantity of dioxin and dioxin-like compounds released from the industry has not decreased in recent years.

The decrease in TWPE is related to the differences in toxicity of the dioxin congeners. EPA accounts for the differences in the relative toxicity of each congener by using a standard congener distribution developed by the National Council for Air and Stream Improvement from mill effluent sampling data (Matuszko, 2006). EPA uses the congener distribution to calculate the TWF applied to dioxin and dioxin-like compound releases in the pulp and paper category.

EPA examined discharges of dioxin and dioxin-like compounds from pulp and paper manufacturers extensively during the detailed study (2005–2006) and previous preliminary studies. EPA determined that the dioxin and dioxin-like compounds discharges reported to TRI did not reflect the actual quantity discharged, because the majority of the estimated releases of dioxin and dioxin-like compounds reported to TRI were based on pollutant concentrations below the Method 1613B minimum levels (MLs), including the congener-specific measurement data that NCASI used to develop an emission factor for wastewater discharges (U.S. EPA, 2006b).

Table 10-7, at the end of this section, lists all mills that reported dioxin and dioxin-like compound discharges to TRI from 2002 to 2005. The 2004 and 2005 data show the same trend that was seen in previous reviews. Forty-seven facilities reported discharges of dioxin and dioxin-like compounds to TRI in 2004 and 59 facilities that reported discharges of dioxin or dioxin-like compounds to TRI in 2005. Although the TWPE of dioxin and dioxin-like compounds discharges decreased from 1,470,000 in 2002 to 147,000 in 2005, the total quantity of dioxin and dioxin-like compounds discharged increased from 65.77 to 82.10 grams. The decrease in TWPE is a direct result of lower reported discharges for the more toxic congeners. One facility, Weyerhaeuser Co. in Bennettsville, SC, reported discharges of dioxin and dioxin-like compounds (0.956 grams) to TRI in 2005 but did not previously report discharges.

The 2004 PCS data include dioxin discharges from only one facility, Bowater Newsprint Calhoun Operations in McMinn County, TN. In addition to reporting 2,3,7,8-tetrachlorodibenzofuran (TCDF) and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) the facility reports “dioxin” discharges to the state of Tennessee. None of the reported parameters representing dioxin and dioxin-like compounds were detected in 2004 except “dioxin,” which was detected only once.

Due to its large TWPE, EPA reviewed the dioxin and dioxin-like compound discharges in the TRI database for Domtar Industries in Ashdown, AR. In 2005, discharges of dioxin and dioxin-like compounds from this mill contributed more than 10 percent of the Pulp and Paper Category’s TRI TWPE. EPA contacted the facility in 2005 to verify the increase in dioxin and dioxin-like compound discharges in TRI 2002 and TRI 2003 (1.8 grams to 40 grams) (Lange, 2005). The TRI 2004 and TRI 2005 reported dioxin and dioxin-like compound discharges are similar to the TRI 2003 data.

EPA determined that Domtar reported increased discharges of dioxin and dioxin-like compounds in 2003 because they changed how they estimate dioxin discharges. Prior to 2003, Domtar estimated dioxin and dioxin-like compound discharges based on total plant flow rate and NCASI emission factor of 105.7 picograms (pg) of dioxin and dioxin-like compounds per liter. In 2003, the mill sampled for dioxins and dioxin-like compounds at the bleach plant monitoring location and used the measured concentration (506.5 pg of dioxin and dioxin-like compounds per liter) in place of the NCASI emission factor. Domtar also said that significant change in plant flow rate occurred between 2002 and 2003. EPA assumes Domtar is using the same method to report dioxin and dioxin-like compound discharges in TRI 2004 and TRI 2005. EPA concluded that the new method of estimating releases of dioxin and dioxin-like compounds from Domtar Ashdown is likely more accurate, and therefore made no changes to the facility's releases.

Despite the increase in dioxin and dioxin-like compounds discharged from Domtar Ashdown, TWPE associated with dioxin and dioxin-like compounds for the entire Pulp and Paper Category has decreased. This decrease is due to lower reported discharges of the more toxic congeners.

10.5 Pulp, Paper, and Paperboard Category Metals Discharges

Metals are the second largest contributor to Pulp and Paper Category TWPE discharges from TRI 2004 and 2005. Of the 639,000 TWPE reported to TRI in 2005, manganese contributes 147,000 TWPE and lead contributes 61,200 TWPE. These releases are similar to those observed in TRI 2002 to 2004.

Aluminum contributes 64,300 of the 165,000 TWPE reported to PCS in 2004 and 92,200 TWPE of the 1,537,076 TWPE reported to PCS in 2002.

EPA examined reported metals discharges from pulp and paper facilities during the Pulp and Paper Detailed Study (2005–2006) and its previous preliminary studies. EPA obtained discharge data in Form 2c of NPDES permit applications for 40 mills. EPA concluded that typical metals discharges from pulp and paper mills were at concentrations too low to be treatable using end-of-pipe treatment technologies for large plant flow rates (U.S. EPA, 2006a). The data from the current review do not lead to any new conclusions.

10.6 Pulp, Paper, and Paperboard Category Conclusions

During the 2008 Annual Review, EPA did not obtain any information to change the conclusions that have previously been made regarding the wastewater discharges from the pulp and paper mills. Therefore, the conclusions of the Pulp and Paper Category review are as follows:

- EPA previously determined that dioxin and dioxin-like compounds are produced during bleaching of papergrade chemical pulp using chlorine and chlorine containing compounds.
- EPA has observed a decrease in the TWPE discharged of dioxin and dioxin-like compounds in PCS and TRI databases. This decrease is due to reductions in the reported discharges of the most toxic dioxin and dioxin-like compounds.

- Based on the findings of the detailed study, aluminum and manganese are not currently pollutants of concern because they were detected at concentrations not considered treatable with end-of-pipe treatment technologies suitable for large effluent flows.
- EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with “(3)” in the “Findings” column in Table V-1 in the accompanying Federal Register notice that presents the 2008 annual review of effluent guidelines and pretreatment standards).

10.7 Pulp, Paper, and Paperboard Category References

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2. Matuszko, Jan; Bicknell, Betsy; and Lange, Bryan. 2006. Memorandum to Public Record for the 2006 Effluent Guidelines Program Plan. “Calculation of a Category-Specific Toxic Weighting Factor for “Dioxin and Dioxin-Like Compounds” Reported Released to EPA’s Toxics Release Inventory (TRI) by Pulp, Paperboard and Paper Mills.” (12 September) EPA-HQ-OW-2004-0032-2393.

3. U.S. Census. 2002. U.S. Economic Census. Available online at: http://www.census.gov/econ/census02.

4. U.S. EPA. 2004. *Technical Support Document for the 2004 Effluent Guidelines Program Plan*. EPA-821-R-04-014. Washington, DC. (August). EPA-HQ-OW-2003-0074-1346 through 1352.

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6. U.S. EPA. 2006b. *Technical Support Document for the 2006 Effluent Guidelines Program Plan*. EPA-821R-06-018. Washington, DC. (December). EPA-HQ-OW-2004-0032-2782.

7. U.S. EPA. 2007. Background Information Document for Permit Writers: Dissolving Kraft and Dissolving Sulfite Pulp Mills. EPA-821R-06-018. Washington, DC. EPA-HQ-OW-2006-0771-0774.

Table 10-7. Dioxin and Dioxin-Like Discharges from Pulp and Paper Mills Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
71822-NKSPP-HIGHW	Domtar Industries Inc Ashdown Mill	Ashdown, AR	38.4	69,000	M	40.96	73,494	M	40	1,511,611	M	1.8	3,203	E
71635-GRGPC-PAPER	Georgia-Pacific Crossett Ops.	Crossett, AR	4.87	8,740	E	5.49	9,850	E	5.49	9,850	E	4.9	8,867	E
71611-NTRNT-FAIRF	International Paper	Pine Bluff, AR	3.7	6,640	O	3.6	6,459	O	0.018	32	E	0.018	32	E
36916-JMSRV-ROUTE	Fort James Operating Co	Pennington, AL	3.6	6,460	M	3.3	5,921	M	5.32	9,551	M	5.3	9,555	M
37662-MDPPR-POBOX	Weyerhaeuser Co Kingsport Paper Mill	Kingsport, TN	3.45	6,190	M	3.4	6,101	M	2.5	4,486	M	2.2	3,894	M
36769-MCMLL-HIGHW	Weyerhaeuser USA Inc Pine Hill Operations	Pine Hill, AL	3.36	6,020	E	2.43	4,369	E	2.34	4,197	E	NR	NR	NR
70791-GRGPC-ZACHA	Georgia-Pacific Corp Port Hudson Operations	Zachary, LA	2.77	4,970	E	2.77	4,974	E	3.32	63,803	E	3.3	63,803	E
36545-BSCSC-307WE	Boise White Paper LLC	Jackson, AL	2.1	3,770	E	2.1	3,768	E	1.98	3,553	E	2.01	3,615	E
28560-WYRHS-STREE	Weyerhaeuser	Vanceboro, NC	1.7	3,050	E	1.74	3,119	E	1.82	3,257	E	1.6	2,924	E
98201-SCTTP-2600F	Kimberly-Clark Worldwide	Everett, WA	1.33	2,380	C	2.7	4,846	C	3	472,778	C	8.2	1,104,866	C
32347-BCKYC-ROUTE	Buckeye Florida Lp	Perry, FL	1.32	2,380	M	1.3	2,330	M	1.27	2,282	M	1.3	2,303	M
27962-WYRHS-TROWB	Weyerhaeuser Co Plymouth	Plymouth, NC	0.989	1,770	E	0.91	1,638	E	0.82	1,470	E	0.74	1,334	E
29512-WLLMT-HWY91	Weyerhaeuser Co	Bennettsville, SC	0.9563	1,715	O	NR	NR	NR	NR	NR	NR	NR	NR	NR
17362-PHGLT-228SO	P. H. Glatfelter Co Spring Grove Mill	Spring Grove, PA	0.946	1,700	E	0.9	1,616	E	0.92	1,653	E	0.86	1,549	E
98362-DSHWM-MARIN	Nippon Paper Industries USA Co. Ltd.	Port Angeles, WA	0.92	1,650	M	1.82	3,266	M	1.8	282	M	1.8	290	M

Table 10-7. Dioxin and Dioxin-Like Discharges from Pulp and Paper Mills Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
37309-BWTRS-ROUTE	Bowater Newsprint Calhoun Operations	Calhoun, TN	0.87	1,560	M	0.94	1,690	M	0.91	1,626	M	0.85	1,528	M
32533-CHMPN-375MU	International Paper Pensacola Mill	Cantonment, FL	0.8	1,440	E	0.93	1,669	E	0.93	1,669	E	0.8	1,435	E
29442-NTRNT-KAMIN	International Paper Georgetown Mill	Georgetown, SC	0.753	1,350	C	0.75	1,351	C	0.77	1,380	C	0.78	1,395	C
75504-NTRNT-POBOX	International Paper Texarkana Mill	Queen City, TX	0.68	1,220	M	3.87	6,944	M	2.36	4,235	M	0.11	197	M
31407-STNCN-1BONN	Weyerhaeuser Co	Port Wentworth, GA	0.679	1,220	E	0.69	1,239	E	0.72	1,284	E	NR	NR	NR
04694-GRGPC-MILLA	Domtar Maine Corp	Baileyville, ME	0.615	1,100	M	0.82	1,463	M	NR	NR	NR	3.15	5,654	E
32034-TTRYN-FOOTO	Rayonier Performance Fibers LLC	Fernandina Beach, FL	0.56	1,000	M	1	1,794	M	NR	NR	NR	0.14	251	M
70775-JMSRV-ENDOF	Tembec USA LLC	Saint Francisville, LA	0.48	861	E	0.502	901	E	0.5	899	E	0.49	873	E
12883-NTRNT-SHORE	International Paper	Ticonderoga, NY	0.46	826	E	0.46	834	E	0.46	817	E	0.46	820	E
83501-PTLTC-805MI	Potlatch Corp Idaho Pulp & Paperboard & Cpd	Lewiston, ID	0.441	792	E	4.18	7,501	E	4.18	7,505	E	4.3	7,657	E
36732-GLFST-HIGHW	Rock-Tenn Mill Co LLC	Demopolis, AL	0.292	524	E	0.32	575	E	0.23	416	E	0.23	410	E
71654-PTLTC-HIGHW	Potlatch Corp	Arkansas City, AR	0.204	365	O	0.97	1,737	O	0.92	1,646	O	0.57	1,026	O
70634-BSSTH-USHIG	Boise Packaging & Newsprint LLC	Deridder, LA	0.19	341	E	0.22	395	E	0.26	467	E	0.31	556	E
31521-BRNSW-14W9T	Brunswick Cellulose Inc	Brunswick, GA	0.186	335	E	0.19	335	E	0.19	335	E	NR	NR	NR

Table 10-7. Dioxin and Dioxin-Like Discharges from Pulp and Paper Mills Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
29044-NNCMP-ROUTE	International Paper	Eastover, SC	0.183	328	O	0.16	282	O	0.16	290	O	0.16	281	O
71220-NTRNT-705CO	International Paper Co Louisiana Mill	Bastrop, LA	0.175	314	E	0.16	280	E	0.22	399	M	0.21	380	M
04976-SDWRR-RFD3U	S.D. Warren Co Sappi Fine Paper N.A.	Skowhegan, ME	0.168	302	O	0.17	305	O	0.18	323	O	0.18	329	O
01238-KMBRL-GREYL	Schweitzer Mauduit International Inc	Lee, MA	0.156	280	O	0.17	303	O	0.153	275	O	0.15	269	O
98421-SMPSN-801PO	Simpson Tacoma Kraft Co.	Tacoma, WA	0.154	277	E	0.135	242	E	0.13	240	E	0.13	232	E
98550-GRYSH-23RDR	Grays Harbor Paper Lp	Hoquiam, WA	0.142	255	C	0.012	22	C	0.012	21	C	0.016	29	C
18629-PRCTR-ROUTE	Procter & Gamble Paper Products Co	Mehoopany, PA	0.087	156	E	0.012	22	C	0.018	33	O	0.0195	35	O
99363-BSCSC-POBOX	Boise White Paper LLC	Wallula, WA	0.083	149	O	0.83	1,496	O	0.14	242	O	0.13	235	O
45601-MDCRP-401SP	Mw Custom Papers LLC	Chillicothe, OH	0.0554	99	M	0.082	147	M	0.0858	154	M	0.099	178	M
54474-WYRHS-200GR	Weyerhaeuser	Rothschild, WI	0.042	75	M	0.048	86	M	0.12	206	M	0.152	273	M
28456-FDRLP-RIEGE	International Paper Riegelwood Mill	Riegelwood, NC	0.0304	55	E	0.0305	55	E	0.0304	55	E	0.03	54	E
98537-WYRHS-700EA	Weyerhaeuser Pulp Mill	Cosmopolis, WA	0.01	18	O	0.01	18	O	0.0093	17	O	0.014	25	O
63702-PRCTR-POBOX	Procter & Gamble Paper Products Co	Jackson, MO	0.0042	8	O	0.0051	9.2	O	0.0047	8.4	O	0.0059	11	O
12502-SCHWT-2424R	Schweitzer-Mauduit International Inc	Ancram, NY	0.004	7	E	0.008	14	E	0.02	36	O	0.02	36	O
31068-BCKYC-OLDST	Weyerhaeuser Co	Oglethorpe, GA	0.001	2	O	0.0005	0.9	O	0.0005	0.9	O	0.0006	1.1	O

Table 10-7. Dioxin and Dioxin-Like Discharges from Pulp and Paper Mills Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
39703-CLMBS-CARSO	Columbus Pulp & Paper Complex	Columbus, MS	0.0007	1	M	0.0007	1.3	M	0.0018	3.2	M	0.0017	3.1	M
54308-THPRC-501EA	Procter & Gamble Paper Products Co	Green Bay, WI	0.0003	1	C	0.0005	0.9	C	0.0006	1.1	C	0.0007	1.3	C
98632-WYRHS-3401I	Weyerhaeuser Co	Longview, WA	NR	NR	NR	NR	NR	NR	0.025	45	O	0.02	36	O
98607-JMSRV-NE4TH	Fort James Camas LLC	Camas, WA	NR	NR	NR	NR	NR	NR	1.06	1,902	E	3.58	6,427	E
97068-JMSRV-4800M	West Linn Paper Co	West Linn, OR	NR	NR	NR	0.006	11	C	0.35	4,139	C	0.502	7.2	C
39120-NTRNT-312LO	International Paper - Natchez	Natchez, MS	NR	NR	NR	NR	NR	NR	1.17	2,099	E	0.81	1,453	E
36701-HMMRM-RIVER	International Paper Riverdale Mill	Selma, AL	NR	NR	NR	0.108	194	E	0.12	208	E	0.12	210	E
36426-CNTNR-HIGHW	Smurfit-Stone Container Enterprises Inc	Brewton, AL	NR	NR	NR	2.5	4,486	E	2.2	3,947	E	2.4	4,306	E
35618-CHMPN-POBOX	International Paper Courtland Mill	Courtland, AL	NR	NR	NR	0.094	168	E	0.088	158	E	0.072	130	E
31558-GLMNP-1000O	Durango-Georgia Paper Co.	Saint Marys, GA	NR	NR	NR	NR	NR	NR	NR	NR	NR	3.4	6,062	O
31520-BRNSW-WEST9	Georgia-Pacific Corp. Brunswick Ops.	Brunswick, GA	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.2	360	E
29704-BWTRC-5300C	Bowater Coated & Specialty Papers Div	Catawba, SC	NR	NR	NR	NR	NR	NR	5.58	261,826	M	3.7	217,867	M
28358-LPHCL-1000E	Buckeye Lumberton Inc.	Lumberton, NC	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.1	1,525	M
23851-NNCMP-HIGHW	International Paper-Franklin Mill	Franklin, VA	NR	NR	NR	2.28	4,086	E	2.27	4,066	E	2.1	3,760	E

Table 10-7. Dioxin and Dioxin-Like Discharges from Pulp and Paper Mills Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
13142-SCHLL-CENTE	Felix Schoeller Technical Papers Inc.	Pulaski, NY	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.0011	26	C
04462-GRTNR-1KATA	Great Northern Paper Inc.	Millinocket, ME	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.037	66	O
04239-NTRNT-RILEY	International Paper	Jay, ME	NR	NR	NR	0.002	3.6	M	0.02	36	M	0.021	38	M
Indirect														
55744-BLNDN-115SW	Upm Blandin Paper Co	Grand Rapids, MN	2.261	4,060	M	2	3,599	M	2.21	60	M	3.2	86	M
52402-CDRRV-4600C	Cedar River Paper A Weyerhaeuser Business	Cedar Rapids, IA	0.46631	837	O	0.35	636	O	NR	NR	NR	NR	NR	NR
23860-STNHP-910IN	Smurfit-Stone Container Corp	Hopewell, VA	0.221	397	O	0.21	378	O	NR	NR	NR	NR	NR	NR
32401-STNCN-1EVER	Smurfit-Stone Container Corp	Panama City, FL	0.0782	140	E	0.078	140	E	0.066	119	E	0.078	140	E
55720-PTLTC-NORTH	Sappi Cloquet LLC	Cloquet, MN	0.04811	86	E	0.044	78	E	0.041	0.18	E	0.041	0.18	E
07407-MRCLP-1MARK	Marcal Paper Mills Inc.	Elmwood Park, NJ	0.02499	45	M	0.00799	14	M	0.014	26	M	0.012	22	M
49443-SDWRR-2400L	S. D. Warren Co	Muskegon, MI	0.023945	43	E	0.042	75	E	0.05	90	E	0.03	54	E
01236-FXRVR-295PA	Fox River Paper Co Rising Paper Div	Housatonic, MA	0.00697	13	O	0.0073	13	O	0.012	22	O	NR	NR	NR
31702-THPRC-USROU	Procter & Gamble Paper Pro Ducts Co	Albany, GA	0.001989	4	O	0.0036	6.4	O	0.0032	5.7	O	0.004	7.1	O
54308-THPRC-501EA	Procter & Gamble Paper Products Co	Green Bay, WI	0.00034	1	C	0.00051	0.9	C	0.00068	1.2	C	0.00085	1.5	C

Table 10-7. Dioxin and Dioxin-Like Discharges from Pulp and Paper Mills Reported to TRI in 2002–2005

TRI ID	Facility Name	Location	2005			2004			2003			2002		
			Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate	Grams Discharged	TWPE	Basis of Estimate
93030-PRCTR-800NO	Procter & Gamble Paper Products Co	Oxnard, CA	0.0000214	0	C	0.0034	6.1	C	0.0002	0.43	C	0.00024	0.43	O

Source: *TRIReleases2005_v2*; *TRIReleases2004_v3*; *TRIReleases2003_v2*; *TRIReleases2002_v4*.
NR — Not reported.
For indirect discharges, the mass shown is the mass transferred to the POTW that is ultimately discharged to surface waters, accounting for an estimated 83 percent removal of dioxin and dioxin-like compounds by the POTW.
The TWPEs in this table were calculated using the 2006 TWFs (the 2006 dioxin and dioxin-like compound TWFs did not change from the August or December 2004 TWFs).
Facilities reported basis of estimate in TRI as: M — Monitoring data/measurements; C — Mass balance calculations; E — Published emission factors; and O — Other approaches (e.g., engineering calculations).

11.0 WASTE COMBUSTORS (40 CFR PART 444)

EPA selected the Waste Combustors Category (40 CFR Part 444) for preliminary review because it ranks high, in terms of TWPE, in point source category rankings (see Tables 5-3 and 5-4 for the point source category rankings). EPA previously performed a preliminary review of this industry, published as part of the 2008 Preliminary ELG Plan (72 FR 61335). As part of the 2008 annual review, EPA investigated possible pesticide discharges from the Waste Combustors Category. EPA has identified that no further review of pesticide discharges from the CWT Category is necessary at this time.

11.1 Waste Combustors Category Background

This subsection provides background on the Waste Combustors Category including a brief profile of the waste combustors industry and background on 40 CFR Part 444.

11.1.1 Waste Combustors Industry Profile

The waste combustors industry includes facilities that recover energy from or dispose of wastes (both hazardous and non-hazardous) by incineration. This industry is represented by one SIC code: 4953 Refuse Systems. However, this SIC code also includes operations from the Centralized Waste Treatment (CWT) Category, regulated under 40 CFR Part 437 (see Section 6.0) and the Landfill Category, regulated under 40 CFR Part 445.

EPA reviewed all of the facilities reporting SIC code 4953 to identify those that are in the Waste Combustors Category rather than the CWT and Landfill Categories. Using information from other preliminary studies, Internet searches, and company Web sites, EPA identified facilities reporting a primary SIC code of 4953 that should be classified in the Waste Combustors Category. Table 11-1 presents the number of facilities in the Waste Combustor Category based on EPA's review.

After finalizing its screening-level database *TRIReleases2005_v02*, EPA learned that two facilities in the CWT Category in *TRIReleases2005_v02* are actually waste combustors. These two facilities contribute less than 0.2 percent of either category's total TWPE in *TRIReleases2005_v02*. Therefore, in the *TRIReleases2005_v02* database, the discharges from these facilities are included as part of the CWT Category; however, EPA included their discharge information in certain tables of this section to augment the 2008 review of waste combustors. For future versions of the *TRIReleases* databases, EPA will classify these facilities as part of the Waste Combustors Category.

Waste combustors discharge directly to surface water as well as to offsite wastewater treatment plants. EPA has identified two waste combustors that send wastewater to offsite wastewater treatment plants. Table 11-2 presents the types of discharges reported by facilities in the 2004 and 2005 TRI database. Table 11-2 includes the two facilities that are currently included in the CWT Category but are waste combustors.

Table 11-1. Number of Facilities in Waste Combustors Category

2004 PCS [a]	2004 TRI [b]	2005 TRI [b]
6	8 [c]	8 [c]

Source: *PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — Major and minor dischargers.
b — Releases to any media.
c — After finalizing *TRIReleases2005_v02*, EPA identified two facilities in the CWT Category that are waste combustors. These two facilities contribute negligible TWPE and do not affect overall rankings. Therefore, EPA included these two facilities in the CWT Category in the *TRIReleases2005_v02* database; however, EPA included their discharge information in this table because they are waste combustors. For future versions of the *TRIReleases* databases, EPA will classify these facilities as part of the Waste Combustors Category.

Table 11-2. Waste Combustors by Type of Discharge Reported in TRI 2004 and 2005 [a]

TRI 2004				TRI 2005			
Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges	Reported Only Direct Discharges	Reported Only Indirect Discharges	Reported Both Direct and Indirect Discharges	Reported No Water Discharges
3	0	0	3	3	0	0	3 [b]
Additional Facilities Identified with Discharges Applicable to the Waste Combustors Category During the 2008 Preliminary Review [a]							
1	1	0	0	1	1	0	0

Source: *TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — After finalizing *TRIReleases2005_v02*, EPA identified two facilities in the CWT Category that are waste combustors. These two facilities contribute negligible TWPE and do not affect overall rankings. Therefore, EPA included these two facilities in the CWT Category in the *TRIReleases2005_v02* database; however, EPA included their discharge information in this table because they are waste combustors. For future versions of the *TRIReleases* databases, EPA will classify these facilities as part of the Waste Combustors Category.
b — EPA identified one facility that sends wastewater to an off-site wastewater treatment plant, but reports null values to TRI for pollutants transferred off-site.

11.1.2 40 CFR Part 444

EPA first promulgated ELGs for the Waste Combustors Category (40 CFR Part 444) on January 27, 2000 (65 FR 4381). The Waste Combustors ELGs apply to wastewater discharges from hazardous waste combustors, except cement kilns, regulated as “incinerators” or “boilers and industrial furnaces” under the Resource Conservation and Recovery Act. The rule applies solely to commercial facilities (i.e., facilities that accept wastes from off-site for fee or remuneration). At the time of promulgation, EPA estimated that the rule would apply to eight facilities (U.S. EPA, 2000).

Table 11-3 lists the pollutants regulated by Part 444. Pesticides are not regulated in any subcategory, as discussed in Section 11-4.

Table 11-3. Applicability of Subcategories in the Waste Combustor Category

Subpart Name	Subpart Applicability	Regulated Pollutants
A: Commercial Hazardous Waste Combustor (CWHC)	The discharge of wastewater from a CHWC facility including any thermal unit, except a cement kiln, if the thermal unit burns RCRA hazardous wastes received from off-site for a fee or other remuneration in the following circumstances. The thermal unit is a commercial hazardous waste combustor if the off-site wastes are generated at a facility not under the same corporate structure or subject to the same ownership as the thermal unit.	TSS, pH, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Silver, Titanium, and Zinc

Source: 40 CFR Part 444; *Development Document for Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors* (U.S. EPA, 2000).

11.2 <u>Waste Combustors Category 2004 Through 2008 Screening-Level Reviews</u>

The Waste Combustors Category was excluded from previous annual reviews because EPA recently promulgated the ELGs (January 27, 2000). Table 11-3 shows the screening-level results for the Waste Combustors Category from the 2002 through 2005 TRI and PCS databases. The TRI TWPE has increased significantly from 2002 to 2004 reporting years, although it decreased again from 2004 to 2005. The largest increase in TWPE is in TRI from 2003 to 2004.

Table 11-4. Waste Combustors Category Screening-Level Results

Year of Review	Year of Data Source	Waste Combustors Category [a,d]	
		TRI TWPE [b]	PCS TWPE [c]
2005	2002	179,672	170
2006	2003	78,705	NA
2007	2004	242,879	155
2008	2005	52,202	NA

Source: *PCSLoads2002_v4*; *TRIReleases2002_v4*; *TRIReleases2003_v2; PCSLoads2004_v4; TRIReleases2004_v3*; *TRIReleases2005_v2*.
a — After finalizing *TRIReleases2005_v02*, EPA identified two facilities included in the CWT Category that are waste combustors. These two facilities contribute negligible TWPE and are not included in this table. For future versions of the *TRIReleases* databases, EPA will classify these facilities as part of the Waste Combustors Category.
b — Direct and indirect water releases only.
c — Major and minor dischargers.
NA — Not applicable. EPA did not evaluate PCS data for 2003 and 2005.

11.3 <u>Waste Combustors Category 2004 Through 2008 Pollutants of Concern</u>

Table 11-5 shows the five pollutants with the highest TWPE in *TRIReleases2004_v3*, *TRIReleases2005_v2*, and *PCSLoads2004_v4* for the Waste Combustors Category. Because EPA did not conduct preliminary reviews of the Waste Combustors Category in 2005 and 2006, EPA did not identify the pollutants with the highest TWPE from the 2002 and 2003 TRI databases or the 2002 PCS database. The Waste Combustors Category TWPE in PCS for 2004 is significantly lower than the TRI TWPE for 2004 or 2005. Therefore, EPA focused the additional review on the TRI-reported pollutants.

Discharges of pesticide chemicals in *TRIReleases2004_v3* and *TRIReleases2005_v2* account for the majority of the total category's TWPE. The pesticide chemicals are benzidine, toxaphene, hexachlorobenzene, and chlordane. Benzidine is the most significant pesticide release reported to TRI, in terms of TWPE, by the Waste Combustors Category. Benzidine is reported by only one facility in 2004, Clean Harbors Deer Park, and no facilities in 2005. Relative contributions of other pesticides reported in 2004 and 2005 to TRI remain the same. Section 11.4 presents EPA's review of pesticide discharges from waste combustor facilities.

Table 11-5. 2008 Review: Waste Combustors Category Pollutants of Concern

Pollutant	PCS 2004 [b]			TRI 2004 [c]			TRI 2005 [c]		
	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE	Number of Facilities Reporting Pollutant	Total Pounds	TWPE
Copper	2	90	57	Pollutants are not in the top five TRI 2004 reported pollutants.			Pollutants are not in the top five TRI 2005 reported pollutants.		
Nitrogen, Kjeldahl Total (As N)	1	8,622	20						
Zinc	2	408	19						
Nickel	1	162	18						
Chromium	1	173	13						
Benzidine	Pollutants are not in the top five PCS 2004 reported pollutants.			1	67	187,680			
Toxaphene				1	1	34,520	1	1.15	34,520
Hexachlorobenzene				1	6	11,901	1	6.63	12,913
Cadmium and Cadmium Compounds				1	138	3,187	Pollutants are not in the top five TRI 2005 reported pollutants.		
Silver and Silver Compounds				2	140	2,304	2	130	2,141
Mercury and Mercury Compounds				Pollutants are not in the top five TRI 2004 reported pollutants.			2	8.33	976
Chlordane							1	0.26	518
Waste Combustors Category Total	**2 [d]**	**944,770**	**155**	**3 [d]**	**5,088**	**242,879**	**3 [d]**	**4,265**	**52,202**

Source: *PCSLoads2004_v4*; *TRIReleases2004_v3*; *TRIReleases2005_v2*.

a — After finalizing *TRIReleases2005_v02*, EPA identified two facilities included in the CWT Category that are waste combustors. These two facilities contribute negligible TWPE and are not included in this table. For future versions of the *TRIReleases* databases, EPA will classify these facilities as part of the Waste Combustors Category.

b — Discharges include only major dischargers.

c — Discharges include transfers to POTWs and account for POTW removals.

d — Number of facilities reporting TWPE greater than zero.

11.4 Waste Combustors Category Pesticide Discharges

EPA reviewed discharges of pesticides from waste combustors because they ranked high, in terms of TWPE, in the PCS and TRI databases. For the 2008 preliminary review, EPA contacted facilities and collected additional discharge data to determine the following:

1. Whether pesticide discharges reported to TRI were based on actual discharges, not estimated based on concentrations of pesticides below analytical minimum levels.
2. Whether waste combustors had an increased receipt of pesticide waste as a result of regulation of wastewater from the pesticides formulating, packaging, and repackaging (PFPR) industry.
3. Pesticides treatment effectiveness, using data from EPA's Pesticides Chemicals ELG rulemaking (U.S. EPA, 1996). Table 6-6 in Section 6 of this document summarizes EPA's treatment efficiency data from the PFPR rulemaking.

The Waste Combustors ELGs (40 CFR Part 444) do not include limitations or standards for pesticides. At the time of the rulemaking, EPA collected grab samples of untreated industrial waste combustor scrubber blowdown water at 12 hazardous waste combustor facilities (U.S. EPA, 2000). Table 11-6 summarizes pesticide sampling data from the Waste Combustors rulemaking. Among other pollutants, EPA analyzed these wastewater samples for pesticides and herbicides. EPA found that pesticides/herbicides were generally only found, if at all, in low concentrations. EPA analyzed the waste combustor samples for the top three pollutants driving the TWPE (benzidine, toxaphene, and hexachlorobenzene); none were detected.

Table 11-6. Sampling Data Summary from Waste Combustors Rulemaking

Pollutant	Minimum Level (µg/L)	Number of Observations	Number of Detects	Mean (µg/L)	Min. (µg/L)	Max. (µg/L)
Atrazine	10	14	1	13.8	8.9	35.6
Dichlorprop	1	11	5	7.2	1.0	47.0
Dinoseb	1	11	2	1.2	0.5	4.5
2,4-D	1	11	2	2.5	1.0	8.9
Non-Detects						
Benzidine	50	27	0	Not Applicable		
Diazinon	2	11	0			
Endrin	0	14	0			
Heptachlor	0	14	0			
Hexachlorobenzene	10	27	0			
Toxaphene	5	14	0			

Source: *Development Document for Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors* (U.S. EPA, 2000).

Discharges of pesticide chemicals in the *TRIReleases* databases for 2004 and 2005 account for the majority of the total category TWPE. EPA examined discharges of pesticides from waste combustors extensively for the preliminary review of this category. EPA contacted facilities that reported high-TWPE pesticide discharges (greater than 50,000 TWPE) or large quantities of pesticides treated on site (greater than 100,000 pounds). Table 11-7 at the end of this section summarizes EPA's findings from each of these calls.

Overall, of the six facilities EPA contacted, five use waste characterization reports provided by offsite facilities delivering untreated waste for TRI reporting. These facilities use removal efficiency estimates to account for the quantity of pesticides removed by their treatment processes. Only one facility, Clean Harbors Deer Park, estimates pesticide discharges using monthly sampling data. This facility has no pesticide detections on record[19] and estimates pesticide discharges using half of the method detection limit for non-detect values. In the following subsections, EPA discusses details of its findings on three facilities:

- Clean Harbors (formerly Safety Kleen) — Deer Park, TX;
- Von Roll America — East Liverpool, OH; and
- Ross Incineration Services — Grafton, OH.

Based on the information collected by contacting the facilities, the amount of pesticides discharged to surface water is less than the amounts reported to TRI and PCS. In addition, the pesticide discharges result from discharges from landfills, which will be corrected in future versions of the databases.

11.4.1 Pesticide Discharges for Clean Harbors — Deer Park, TX

The pesticide discharges from Clean Harbors in Deer Park, TX, contribute approximately 235,000 TWPE to TRI 2004 and 48,300 TWPE to TRI 2005. Table 11-7 shows pesticides discharges reported to TRI from the facility for 2004 to 2005.

Table 11-7. Clean Harbors — Deer Park, TX TRI-Reported Pesticide Discharge

Pollutant	TRIReleases2004		TRIReleases2005	
	Total Pounds Released [a]	TWPE	Total Pounds Released [a]	TWPE
Aldrin	0.02	223	0.02	223
Benzidine	66.61	187,680	NR	NR
Chlordane	0.26	518	0.26	518
Heptachlor	0.02	171	0.02	171
Hexachlorobenzene	6.11	11,901	6.63	12,913
Toxaphene	1.15	34,520	1.15	34,520

Source: *TRIReleases2004_v3; TRIReleases2005_v2.*
a — Discharges include transfers to POTWs and account for POTW removals.

EPA contacted Clean Harbors in 2007 and 2008 about their pesticide discharges reported to TRI (Finseth, 2007; Krejci, 2008a). Clean Harbors incinerates all of the waste they receive. They also have two onsite landfills where they dispose of ash from the incinerator, filter cake from the wastewater treatment plant, and construction debris. The landfills are permitted for

[19] The facility contact stated that pesticides might have been detected in the past, and that any detections of pesticides in the facility's wastewater would result from the leachate discharged from the onsite landfill.

direct disposal of offsite wastes, but Clean Harbors typically incinerates all of its wastes prior to sending waste to the landfill. The wastewater treatment plant treats quench water from the incinerators' venturi scrubbers and landfill leachate. Clean Harbors reports pesticide discharges using monthly wastewater sampling data from the onsite wastewater treatment plant. According to the point of contact, any pesticides detected in the facility's wastewater would depend on the type of waste being incinerated at that time.

EPA obtained wastewater sampling data for toxaphene and hexachlorobenzene for all of 2006 from Clean Harbors Deer Park. Neither toxaphene nor hexachlorobenzene was detected during the 12 months of sampling. For non-detect results, Clean Harbors Deer Park uses half of the detection limit for their TRI reporting. Table 11-8 presents the monitoring data provided by Clean Harbors.

Table 11-8. Clean Harbors — Deer Park, TX Wastewater Sampling Data

Sampling Date	Hexachlorobenzene		Toxaphene	
	Detected?	Concentration (µg/L)	Detected?	Concentration (µg/L)
January-06	N	1.5	N	0.26
February-06	N	1.5	N	0.26
March-06	N	1.5	N	0.26
April-06	N	1.5	N	0.26
May-06	N	1.5	N	0.26
June-06	N	1.5	N	0.26
July-06	N	1.5	N	0.26
August-06	N	1.5	N	0.26
September-06	N	1.5	N	0.26
October-06	N	1.5	N	0.26
November-06	N	1.5	N	0.26
December-06	N	1.5	N	0.26

Source: Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Kevin Honohan, Clean Harbors, Deer Park, TX (Krejci, 2008a).

The facility contact stated that pesticides have been detected in the facility's wastewater in the past; however, the facility does not have any record of these detections. Personnel believe that any detection of pesticides in the facility's wastewater would result from the leachate discharged from the onsite landfills. Therefore, the facility has no record of pesticide detection, and any pesticide discharges would be covered by Part 445, the Landfills Point Source Category effluent guidelines (Krejci, 2008a).

Table 11-9 shows estimated pesticide release amounts, based on the facility's sampling results in Table 11-8. EPA estimated the loads under three different scenarios:

1. Assuming non-detect concentrations are equal to the detection limit;
2. Assuming non-detect concentrations are equal to half the detection limit; and
3. Assuming non-detect concentrations are zero.

The table also shows the values reported to TRI, for comparison purposes. Based on the facility sampling data showing all concentrations below detection, the facility's 2006 loads were likely less than 5,500 TWPE (toxaphene) and 14,700 TWPE (hexachlorobenzene).

Table 11-9. Clean Harbors — Deer Park, TX 2006 Discharges Estimated from Sampling Data for Toxaphene and Hexachlorobenzene

Detection Limit Scenario	Hexachlorobenzene		Toxaphene	
	lbs/yr	TWPE/yr	lbs/yr	TWPE/yr
Value Reported to the 2006 TRI	5.7	11,099	1	30,017
Assume Non-Detects= MDL	5.63	10,963	0.98	29,417
Assume Non-Detects = ½ × MDL	2.82	5,491	0.49	14,709
Assume Non-Detects = 0	0	0	0	0

Source: Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Kevin Honohan, Clean Harbors, Deer Park, TX (Krejci, 2008a).

11.4.2 Pesticides Management at Von Roll America – East Liverpool, OH

The pesticide discharges from Von Roll America in East Liverpool, OH, contribute negligible pesticide TWPE to TRI in 2004 and 2005 (331 TWPE and 330 TWPE, respectively). However, the facility reported treating approximately 1,000,000 pounds of pesticide waste by incineration each year from 2003 to 2005.

EPA contacted the facility in 2008 to determine the source of the facility's wastewater discharges and to discuss pesticide management at the facility (Krejci, 2008b). According to the point of contact, blowdown from the incinerator's wet scrubber system is neutralized and recycled to the scrubber. Estimates of pesticide discharges reported to TRI are based on stormwater discharges, rather than process wastewater. In addition, the treatment process for the scrubber blowdown creates a powdered residual waste that the facility refers to as "ash." The ash is sent off site to landfill disposal, after being tested according to Land Disposal Restriction (LDR) standards (40 CFR Part 268). The LDR standards require that the facility test for all pollutants on the underlying hazardous constituents list, including a variety of pesticides. The facility has never detected any pesticides in its waste ash (Krejci, 2008b).

Von Roll America estimates the discharges reported to TRI using waste characterization reports submitted by clients in conjunction with periodic testing of waste received to verify the characterization reports. The facility has not tested its wastewater for pesticides (Krejci, 2008b).

EPA also collected information, where available, on increased receipt of pesticide waste receipt resulting from the PFPR ELGs. The PFPR ELGs, Part 455 Subpart C, was promulgated in 1996 and requires zero discharge of process wastewater from PFPR manufacturing (U.S. EPA, 1996). As a result of the zero discharge requirement, PFPR facilities may send their wastewater off site, including to incinerators. According to the point of contact, the facility received pesticides consistently until 2007, when the overall pesticide receipt increased by approximately 25 percent (Krejci, 2008b). Therefore, the increase in pesticides receipt does not appear to result from the PFPR ELGs.

11.4.3 Pesticides Management at Ross Incineration Services – Grafton, OH

Ross Incineration Services in Grafton, OH, reported treating over 120,000 pounds of pesticide wastes annually to TRI from 2003 to 2005. EPA contacted the facility in 2008 because of the large quantity of pesticides incinerated on site (Krejci, 2008c).

Ross Incineration Services operates an incinerator with a wet scrubber system for disposal of commercial wastes. The facility sends wastewater from the wet scrubber system to an offsite wastewater treatment plant. The facility tests the wastewater delivered to the treatment plant on a quarterly basis for a variety of pollutants, but has never detected any pesticides since it began sampling in the early 1990s (Krejci, 2008c).

EPA also collected information, where available, on increased receipt of pesticide waste resulting from the PFPR ELGs. The PFPR ELGs, Part 455 Subpart C, was promulgated in 1996 and requires zero discharge of process wastewater from PFPR manufacturing (U.S. EPA, 1996). As a result of the zero discharge requirements, PFPR facilities may send their wastewater off site, including to incinerators. According to the point of contact, Ross Incineration Services has seen a recent increase in pesticides receipt at the facility, although the increased pesticides receipt may result from an overall increase in total waste received (Krejci, 2008c).

11.5 Waste Combustors Category Conclusions

During the 2008 Annual Review, EPA used information gathered from TRI and PCS databases and facility contacts to conclude that no further review of the Waste Combustor Category is necessary at this time. The conclusions of the Waste Combustor Category review are as follows:

- TRI-reported discharges of pesticides account for the majority of the Waste Combustors Category's TWPE. EPA determined that pesticide releases from waste combustors (with the exception of Clean Harbors Deer Park) are generally estimated using waste characterization reports from clients and treatment efficiency data, rather than actual sampling data. Clean Harbors Deer Park estimates discharges based on sampling data, and no pesticides were detected in 2006. Based on the facility sampling data showing all concentrations below detection, the facility's 2006 loads were likely less than 5,500 TWPE (toxaphene) and 14,700 TWPE (hexachlorobenzene). In addition, the facility believes any pesticides detected in the wastewater result from landfill leachate, not incineration.
- EPA did not identify any facilities that detected pesticides in the wastewater from their waste combustion operations. The contact at Clean Harbors Deer Park, the highest ranking facility in terms of overall TWPE, stated that pesticides were detected in the past, but no records are available for those detections. The facility contact also stated that any pesticide discharge results from one of the onsite landfills. As a result, no pesticide discharge results would be regulated by Part 444, Waste Combustors. In future versions of the TRI databases, EPA will correct pesticide discharges from this facility, classifying the discharge under the Landfills Point Source Category.

- EPA contacted six waste combustor facilities. Of these, five used waste characterization reports provided by offsite facilities delivering untreated waste to estimate releases for TRI reporting. Two of the six facilities had tested for pesticides in their wastewater and one facility had tested for pesticides in its wastewater treatment residuals. None of the facilities had any detections of pesticides on record.
- EPA prioritizes point source categories with existing regulations for potential revision based on the greatest estimated toxicity to human health and the environment, measured as TWPE. Based on the above conclusions, EPA is assigning this category with a lower priority for revision (i.e., this category is marked with "(3)" in the "Findings" column in Table V-1 in the accompanying Federal Register notice that presents the 2008 annual review of effluent guidelines and pretreatment standards).

11.6 Waste Combustors Category References

1. Finseth, TJ. 2007b. Eastern Research Group, Inc. Notes from telephone conversation between TJ Finseth, Eastern Research Group, Inc., and Craig Elam, Clean Harbors. "Clean Harbors direct pesticide discharges reported to Toxics Release Inventory (TRI) in 2004." (May 1). EPA-HQ-OW-2006-0771-0445.

2. Krejci, Christopher. 2008a. Eastern Research Group, Inc. Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Kevin Honohan, Clean Harbors, Deer Park, TX. "Clean Harbors Deer Park Pesticides Discharges in TRI." (March 17). EPA-HQ-OW-2006-0771 DCN 05973.

3. Krejci, Christopher. 2008b. Eastern Research Group, Inc. Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Steve Lorah, Von Roll America, East Liverpool, OH. "Pesticides Treatment at Von Roll America." (March 13). EPA-HQ-OW-2006-0771 DCN 05942.

4. Krejci, Christopher. 2008c. Eastern Research Group, Inc. Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Jeffrey Lynch, Ross Incineration Services, Grafton, OH. "Pesticides Treatment at Ross Incineration Services." (March 27). EPA-HQ-OW-2006-0771 DCN 05944.

5. Krejci, Christopher. 2008d. Eastern Research Group, Inc. Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Dan Duncan, ONYX Environmental Services (aka Veolia Environmental Services), Port Arthur, TX. "Pesticides Receipt and Possible Discharge at ONYX Port Arthur." (March 25). EPA-HQ-OW-2006-0771 DCN 05941.

6. Krejci, Christopher. 2008e. Eastern Research Group, Inc. Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Dan Robley, Terris, LLC (aka Clean Harbors El Dorado), El Dorado, AR. "Pesticides Receipt and Possible Discharge at Terris." (April 9). EPA-HQ-OW-2006-0771 DCN 05943.

7. Krejci, Christopher. 2008f. Eastern Research Group, Inc. Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Dennis Warchol, ONYX Environmental Services Incineration Services (aka Veolia Environmental Services), Sauget, IL. "Pesticides Receipt and Possible Discharge at ONYX Sauget." (March 27). EPA-HQ-OW-2006-0771 DCN 05945.

8. U.S. EPA. 1996. *Technical Development Document for the Pesticides Formulating, Packaging, and Re-packaging Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards*. EPA-821-R-96-019. Washington, DC. (September 30).

9. U.S. EPA. 2000. *Development Document for Final Effluent Limitations Guidelines and Standards for Commercial Hazardous Waste Combustors*. EPA-821-R-99-020. Washington, DC. (January). Available online at: http://epa.gov/guide/chwc/final/technical.html.

Table 11-10. Summary of Waste Combustor Pesticide Facility Contacts

Facility Name	City	Facility TWPE from TRI 2005	Facility Receives Pesticides?	Pesticides Detected in Treated Wastewater?	Comments
Clean Harbors Deer Park LP	Deer Park, TX	51,858.58	Yes	Yes	Facility tests for a variety of pesticides as required by their Texas Pollutant Discharge Elimination System (TPDES) permit. Facility submitted sampling data for 2006 which does not reveal any pesticide detections. Facility contact believes pesticides have been detected in the past, but the contact has no record of this. Also, any pesticides detected at permitted outfalls result from landfill leachate (Krejci, 2008a).
Von Roll America Inc	East Liverpool, OH	329.95	Yes	No	Facility does not discharge process wastewater from incinerators — it is treated and recycled. Residuals are sent to an off-site landfill. Pesticides receipt at the facility in 2007 was approximately 25% above normal levels (Krejci, 2008b).
Onyx Environmental Services LLC [a]	Port Arthur, TX	94.51	Yes	No	Facility disposes of scrubber blowdown by deep-well injection. Facility has not seen a noticeable increase in pesticides receipt in recent years (Krejci, 2008d).
Teris LLC	El Dorado, AR	13.58	Yes	No	Facility samples approximately 10 percent of their influent for various chemicals, including pesticides. Facility frequently detects pesticides in the incoming waste shipments, but does not discharge any wastewater. Incinerator uses a dry emissions control system (baghouse). For TRI reporting, the facility uses waste characterization profiles provided by clients (Krejci, 2008e).
Onyx Environmental Services [a]	Sauget, IL	0.73	Yes	No	Facility does not generate wastewater (incinerator emissions flow through a dry scrubber). Facility has not seen an increase in pesticides receipt in recent years. Facility estimates the quantities reported to TRI based on waste characterization reports provided by clients (Krejci, 2008f).

Table 11-10. Summary of Waste Combustor Pesticide Facility Contacts

Facility Name	City	Facility TWPE from TRI 2005	Facility Receives Pesticides?	Pesticides Detected in Treated Wastewater?	Comments
Ross Incineration Services Inc	Grafton, OH	NA	Yes	No	Facility does not discharge process wastewater from incinerators. Scrubber blowdown is sent to an off-site wastewater treatment facility. The facility tests for a variety of pesticides on a quarterly basis, and has not detected any since they first began testing in the early 1990s. The facility generally uses waste characterization reports in conjunction with emissions factors to calculate releases for TRI reporting. Pesticides receipt at the facility has definitely increased in recent years, but total waste received has also increased. It is unclear how much the pesticides fraction of total waste has increased (Krejci, 2008c).

Source: Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Kevin Honohan, Clean Harbors, Deer Park, TX (Krejci, 2008a); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Steve Lorah, Von Roll America, East Liverpool, OH (Krejci, 2008b); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Jeffrey Lynch, Ross Incineration Services, Grafton, OH (Krejci, 2008c); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Dan Duncan, ONYX Environmental Services (aka Veolia Environmental Services), Port Arthur, TX (Krejci, 2008d); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Dan Robley, Terris, LLC (aka Clean Harbors El Dorado), El Dorado, AR (Krejci, 2008e); Notes from telephone conversation between Christopher Krejci, Eastern Research Group, Inc., and Dennis Warchol, ONYX Environmental Services Incineration Services (aka Veolia Environmental Servcices), Sauget, IL (Krejci, 2008f).

a — EPA included these two facilities in the CWT Category but learned from facility contacts that they are waste combustors. These two facilities are included in this table because they are waste combustors, but *TRIReleases2005_v02* classifies them as CWTs. They contribute negligible TWPE and do not affect overall rankings; therefore, EPA did not correct *TRIReleases_v02*. For future versions of the *TRIReleases* databases, EPA will classify these facilities as part of the Waste Combustor Category.

NA — Not applicable. Ross Incineration Services Inc does not report water discharges to TRI.

PART III: DETAILED STUDIES

12.0 COAL MINING CATEGORY (PART 434)

The purpose of this report is to summarize the analytical approach, research activities, and findings of the Coal Mining Detailed Study that EPA conducted to evaluate the comments received from a public interest group and from states and industry urging revisions to pollutant limitations in the Coal Mining Effluent Limitations Guidelines and Standards (ELGs) (40 CFR Part 434) (see 71 FR 76644-76667, December 21, 2006; 72 FR 61342-61343, October 30, 2007).

To facilitate this study, EPA identified data sources, developed a methodology for estimating treatment costs and discharge loads, and initiated data collection activities in consultation with the Interstate Mining Compact Commission, state agencies in West Virginia and Pennsylvania, and the Office of Surface Mining, Reclamation, and Enforcement within the U.S. Department of the Interior (U.S. EPA, 2007). EPA's analysis focused primarily on Pennsylvania and West Virginia because acid mine drainage (AMD) from coal mining, commonly containing manganese, is most prevalent in these two states.

EPA also evaluated the technology basis for the existing Coal Mining ELGs rulemakings: chemical precipitation and settling (U.S. EPA, 1976). EPA evaluated the current application of this technology, treatment costs, and pollutant discharge loads (see Sections 6.1, 7.0, and 8.0, respectively). EPA reviewed scientific literature and participated in discussions with state regulatory personnel in order to assess the potential effects of manganese discharges to surface water and to determine whether other pollutants in coal mining discharges are of concern (see Section 9.0). EPA also addressed the question of whether coal mining companies are forfeiting bonds because of the cost of manganese treatment by examining bonding requirements, past bond forfeiture rates, and future potential bond forfeiture rates (see Section 10.0).

12.1 Summary of Public Comments

The public interest group, the Environmental Law and Policy Center (ELPC), asked EPA to place more stringent controls on total dissolved solids (TDS) (e.g., sulfates and chlorides), mercury, cadmium, manganese, and selenium in coal mining discharges. ELPC referenced a study by EPA Region 5 on potential adverse impacts of the discharge of sulfates on aquatic life (EPA-HQ-OW-2004-0032-2614 through 2617).

The Interstate Mining Compact Commission, which represents mining regulatory agencies in 28 states, state mine permitting agencies in Pennsylvania and Virginia, two Pennsylvania coal mining companies, and a Pennsylvania coal mining trade association, asked EPA to remove the current manganese limitations stating:

1. Manganese treatment doubles or triples overall treatment costs resulting in the forfeiture of Surface Mining Control and Reclamation Act (SMCRA) bonds;
2. Manganese treatment is unnecessary to protect aquatic life and there are no widespread toxicity problems from discharges of manganese;
3. Manganese treatment sometimes results in environmental harm because mining operators must add excessive chemicals to meet the discharge limits;
4. EPA should reconsider its rationale for setting manganese limits to ensure surrogate removal of other metals because data show that other metals occur only in low concentrations; and

5. Manganese limits discourage the use of passive treatment technologies which are more environmentally beneficial than active treatment because the limits are overly stringent.

Individual state and industry commenters cited the following factors in support of their comments:

1. States enacted more stringent coal mining reclamation bonding requirements after the promulgation of SMCRA to control water discharges from mines undergoing reclamation;
2. Studies support their contention that manganese is not harmful to aquatic life at levels above the current effluent limits; and
3. Active treatment with chemical additions is perceived to possibly complicate permit compliance and cause environmental harm.

12.2 Key Definitions

Proper understanding of the following terms is essential to understanding EPA's response to the public commenters. The following terms are from 40 CFR Part 434 Subpart A – General Provisions:

- Acid or ferruginous mine drainage. Mine drainage which, before any treatment, either has a pH of less than 6.0 or a total iron concentration equal to or greater than 10 mg/L (40 CFR 434.11(a)).
- Active mining area. The area, on and beneath land, used or disturbed in activity related to the extraction, removal, or recovery of coal from its natural deposits. This term excludes coal preparation plants, coal preparation plant associated areas and post-mining areas (40 CFR 434.11(b)).
- Alkaline, mine drainage. Mine drainage which, before any treatment, has a pH equal to or greater than 6.0 and total iron concentration of less than 10 mg/L (40 CFR 434.11(c)).
- Bond release. The time at which the appropriate regulatory authority returns a reclamation or performance bond based upon its determination that reclamation work (including, in the case of underground mines, mine sealing and abandonment procedures) has been satisfactorily completed (40 CFR 434.11(d)).
- Post-mining area. (1) A reclamation area or (2) The underground workings of an underground coal mine after the extraction, removal, or recovery of coal from its natural deposit has ceased and prior to bond release (40 CFR 434.11(k)).
- Reclamation area. The surface area of a coal mine which has been returned to required contour and on which re-vegetation (specifically, seeding or planting) work has commenced (40 CFR 434.11(l)).

12.3 Applicability of 40 CFR Part 434 Manganese Effluent Limits

It is important to note that EPA has promulgated manganese effluent limits only for the following subset of coal mining operations as codified in 40 CFR Part 434:

1. Active surface and underground mining areas with acid or ferruginous mine drainage discharges (Subpart C – Acid or Ferruginous Mine Drainage); and
2. Underground post-mining areas with acid or ferruginous mine drainage discharges (Subpart E – Post Mining Areas).

There are no national manganese effluent limits for surface post-mining areas with AMD, nor for any surface or underground alkaline mine drainage discharges. There are no national manganese effluent limits for AMD that may develop after SMCRA bond release has been granted, nor are there national manganese effluent limits for AMD from abandoned coal mines.

12.4 Key Findings Concerning Public Comments

The following is a summary of key findings of the Coal Mining Detailed Study in response to comments received from stakeholders. The findings are discussed in more detail throughout the remainder of the study.

12.4.1 Bond Forfeitures

EPA clarified states' comments regarding the costs of EPA's 40 CFR Part 434 manganese limits. In their initial public comments, state commenters did not distinguish the costs of manganese removal among the three phases of coal mining: active mining areas, post-mining areas, and post-bond release areas. This is important because the Part 434 manganese limits only apply to a subset of coal mining phases. EPA clarified through discussions with state agencies that states are most concerned about the cost of manganese treatment at post-mining areas where bonds cannot be released because effluent manganese concentrations in the discharges exceed the permit limits. States expressed a concern that operators at such mines may default on their bonds rather than renew their bonds as required every five years. States indicate that reduced manganese treatment costs at such mines may decrease the number of potential bond forfeitures (Codding, 2006). EPA, however, is not able to address this issue through revisions to Part 434 because there are no manganese limits for surface post-mining areas. EPA's review of state data indicates that manganese limits in permits for discharges from surface post-mining areas are derived by state permit writers from state manganese water quality standards or from site specific best professional judgment (BPJ) technology-based effluent limits. There are, however, manganese limits for underground post-mining areas with AMD which are adequate and to which no changes are warranted at this time. See Section 4.1 for additional information on the applicability of Part 434 and water quality standards and Section 5.2.1 for additional information on the manganese water quality-based limits.

EPA found that manganese removal does double or triple treatment costs, but for active surface and underground mining areas with AMD (regulated by Part 434 Subpart C Acid or Ferruginous Mine Drainage) and post-mining areas of underground mines with AMD (regulated by Subpart E Post-Mining Areas) manganese treatment technology is available (see Section 6.0), economically achievable (see 42 FR 23180-21390, April 26, 1977), and compliance rates with permit limits derived from the Part 434 management limits are high (see Section 5.2).

Based on information received from Pennsylvania and West Virginia, EPA concluded that only a small percentage of coal mine bond forfeitures are due to the cost of manganese treatment. Overall, EPA found that there is little potential for future bond forfeitures on SMCRA permits that have been granted during the past five years or will be granted in the future. Similarly, EPA believes that current trends will continue, making it unlikely that companies will forfeit bonds on permits that will be issued in the future. EPA's analysis indicates that forfeitures are largely a legacy of the first decade of SMCRA implementation during the 1980s and early 1990s. In particular, SMCRA requires a Probable Hydrologic Consequence (PHC) analysis prior to approval of the SMCRA permit in order to identify regional hydrologic impacts associated with the coal mining and reclamation operation. The PHC is a determination of baseline quality and quantity of ground water and surface water and the impact the proposed mining will have on these baseline conditions. When potential adverse impacts are identified (e.g., AMD) through use of the PHC, appropriate protection, mitigation, and rehabilitation plans are developed and included in mining and reclamation permit requirements. If the potential adverse impacts cannot be sufficiently mitigated the SMCRA permit may be denied. The ultimate goal of using the PHC in the SMCRA permit review is to prevent AMD after land reclamation is complete and the SMCRA bond is released. PHC analytical techniques have evolved over time due to increasing knowledge. The current methods for PHC analysis are more advanced and can adequately predict AMD formation, where as in the past predictions were not as accurate. Based on the advancements in the PHC analysis, Pennsylvania Department of Environmental Protection anticipates that less than one percent of recently SMCRA permitted mines will develop AMD after reclamation and bond release. See Section 10.0 for additional information on the reasons for bond forfeitures.

12.4.2 Potential Environmental Impacts

Due to data limitations, EPA was able to conduct only a very limited analysis of potential impacts from TDS (e.g., sulfates and chlorides), mercury, cadmium, manganese, and selenium in order to respond to comments that more stringent controls on these pollutants may be warranted. EPA reviewed readily available literature and analyzed mine drainage information provided by Pennsylvania and West Virginia in order to better understand the potential for human health and aquatic life effects of these pollutants. EPA found limited information concerning documented environmental impacts. The discharge data provided by OSMRE and the states was difficult to use for the purpose of assessing potential impacts because of the small sample sizes for certain pollutants and inconsistencies across data sets due to different collection purposes. EPA's review of potential impacts is discussed in Section 9.0 of this report.

12.4.3 Surrogate Removal of Metals through Manganese Treatment

EPA reviewed the technical development documents and federal register notices supporting the Coal Mining ELGs and did not identify any discussion regarding promulgating manganese effluent guidelines to ensure surrogate removal of other metals. EPA's review of these documents showed that EPA's rationale for requiring manganese control for a subset of coal mines was to address drinking water organoleptic effects (U.S. EPA, 1976).

12.4.4 Effectiveness of Passive Treatment Systems

EPA reviewed the cost and performance of passive treatment systems and concluded that they are less expensive than active treatment systems, but they generally do not perform as well as active treatment systems. See Section 6.2 for more information.

12.5 EPA 2008 Decision on Revising Part 434 Effluent Guidelines

Based on its review of the available data and the findings described above, EPA is not proposing revisions to the pollutant limitations in the coal mining effluent guidelines (40 CFR Part 434). As with all industrial discharges, EPA will continue to examine discharges from coal mines in future annual reviews to determine if existing effluent guidelines are appropriate and sufficient.

12.6 Introduction References

1. Codding, Ellie. 2006. Memorandum to Docket EPA-HQ-OW-2004-0032. "RE: Draft Meeting Minutes for 6/15/06 Conference Call with Office of Surface Mining Reclamation and Enforcement." (June 26). EPA-HQ-OW-2004-0032-2517.

2. U.S. EPA. 1976. Development Document for Interim Final Effluent Limitations Guidelines and New Source Performance Standards for the Coal Mining Point Source Category. EPA 440/1-76/057-a. (May). Washington, D.C. EPA-HQ-OW-2006-0771 DCN 06117.

3. U.S. EPA. 2007. *Detailed Study Plan for the Coal Mining Point Source Category (Part 434)*. (September). Washington, D.C. EPA-HQ-OW-2006-0771-0011.

13.0 HEALTH SERVICES INDUSTRY AND HOSPITALS CATEGORY (PART 460)

EPA identified the Health Services Industry as a candidate for a detailed study in the final 2006 Effluent Guidelines Program Plan (71 FR 76656, December 21, 2006). The Health Services Industry includes establishments engaged in various aspects of human health (e.g., hospitals, hospices, long-term care facilities, dentists) and animal health (e.g., veterinarians). Health services establishments fall under SIC major group 80 "Health Services" and industry group 074 "Veterinary Services." According to the 2002 U.S. Economic Census, there are over 475,000 facilities in the Health Services Industry (U.S. Census, 2005). EPA is including the following sectors within the Health Services Industry in its detailed study (70 FR 51054, August 29, 2005):

- Offices and Clinics of Dentists;
- Doctors and Mental Health Practitioners;
- Nursing and Personal Care Facilities (long-term care facilities);
- Hospitals, Hospices and Clinics;
- Medical Laboratories and Diagnostic Centers; and
- Veterinary Care Services.

As discussed below, EPA is focusing on two main issues for these sectors within this industry.

All these sectors require services to be delivered by trained professionals for the purpose of providing health care and social assistance for individuals or animals. These entities may be free standing or part of a hospital or health system and may be privately or publicly owned. The services can include diagnostic, preventative, cosmetic, and curative health services.

The vast majority of establishments in the health services industries are not subject to categorical limitations and standards. In 1976, EPA promulgated 40 CFR 460, which only applies to direct discharging hospitals. Part 460 did not establish pretreatment standards for indirect discharging facilities.

In evaluating the health services industries to date, EPA has found little readily available information from EPA databases. Both EPA's Permit Compliance System (PCS) and Toxics Release Inventory (TRI) contain sparse information on health care service establishments. For 2002, PCS only has data for two facilities that are considered "major" sources of pollutants, and only Federal facilities in the healthcare industry are required to report to TRI.

Based on preliminary information, major pollutants of concern in discharges from health care service establishments include solvents, mercury, pharmaceuticals, and biohazards (e.g., items contaminated with blood) (U.S. EPA, 2005). The majority of the mercury originates from the following sources: amalgam used in dental facilities and medical equipment, laboratory reagents, and cleaning supplies used in healthcare facilities (Fairfax, 2006; Johnston, 2005). EPA found little to no quantitative information on wastewater discharges of pollutants of emerging concern such as pharmaceuticals but was able to identify some information on biohazards (OH EPA, 1993).

As described above, the Health Services Industry is expansive and contains approximately half a million facilities. Because of the size and diversity of this category and other resource constraints, EPA decided to focus its detailed study on certain types of dischargers. EPA selected its focus areas, for the most part, to respond to stakeholder concerns. The focus areas are:

- *Dental mercury*: EPA focused its evaluation on mercury discharges from the offices and clinics of dentists due to the potential hazard and bioaccumulative properties associated with mercury.
- *Unused pharmaceuticals*: EPA is focusing its evaluation on the management of unused or leftover pharmaceuticals from health service facilities due to the growing concern over the discharge of pharmaceuticals into water and the potential environmental effects.

13.1 Dental Mercury

The Agency notes that it has an overall interest in mercury reduction and on July 5, 2006, issued a report titled, "EPA's Roadmap for Mercury," (U.S. EPA, 2006a). Among other things, EPA's report highlights mercury sources and describes progress to date in addressing mercury sources. As part of the 2008 Health Services Industry detailed study, EPA researched the following questions/topics for the 2008 final plan as they relate to disposal of mercury into municipal sewer systems:

- What are current industry practices regarding the mercury disposal? To what extent are each of these practices applied? What factors drive current practices?
- Are there federal, state, or local requirements or guidance for disposal of mercury? What are these requirements?
- How are control authorities currently controlling (or not controlling) disposal of mercury via wastewater?
- To what extent do POTWs report pass through or interference problems related to mercury discharges?
- What technologies are available: (1) as alternatives to wastewater disposal; and (2) to control pollutant discharges. Is there any qualitative or quantitative information on their efficiency?
- What Best Management Practices (BMPs) are used as alternatives to wastewater disposal and/or to control discharges and is there any qualitative or quantitative information on their efficiency?
- Is there any quantitative or qualitative information on the costs associated with identified technologies and/or BMPs?

Across the United States, many States and municipal wastewater treatment plants (publicly owned treatment works [POTWs]) are working toward the goal of reducing discharges of mercury into collection systems. Many studies have been conducted in an attempt to identify the sources of mercury entering these collection systems. According to the 2002 Mercury Source Control and Pollution Prevention Program Final Report prepared for the National Association of Clean Water Agencies (NACWA), dental clinics are the main source of mercury discharges to POTWs. The American Dental Association (ADA) estimated in 2003 that up to 50 percent of mercury entering POTWs was contributed by dental offices (Vandeven, 2005).

EPA estimates there are approximately 160,000 dentists working in 120,000 dental offices that use or remove amalgam in the United States – almost all of which discharge their wastewater exclusively to POTWs. Mercury in dental wastewater originates from waste particles associated with the placement and removal of amalgam fillings. Most dental offices currently use some type of basic filtration system to reduce the amount of mercury solids passing into the sewer system. However, BMPs and the installation of amalgam separators, which generally have a removal efficiency of 95 percent, have been shown to reduce discharges even further. A recent study funded by NACWA (Larry Walker Associates, 2002) concluded that the use of amalgam separators results in reductions in POTW influent concentrations and biosolids mercury concentrations. Use of amalgam separators does not always result in reductions in POTW effluent, however, since most amalgam particles are removed with biosolids. Mercury that partitions to wastewater sludge may be incinerated or disposed to a landfill.

States, Regions, and localities have implemented mandatory and voluntary programs to reduce dental mercury discharges. Specifically, 11 states and at least 19 localities have mandatory pretreatment programs that require the use of dental mercury amalgam separators (U.S. EPA, 2008a). Additionally, at least 20 POTWs have voluntary programs to reduce mercury discharges from dental offices. Success rates for these voluntary programs vary greatly, and are usually higher when there is a mandatory "second phase" to the voluntary program. EPA Region 5 published guidance for permitting dental mercury discharges (U.S. EPA, 2004). The ADA has also adopted and published BMPs for its members. On October 2, 2007, the ADA updated its BMPs to include the use of amalgam separators (ADA, 2007). The document titled *Health Services Industry Detailed Study: Dental Amalgam*, compiles the information EPA has collected to date on existing guidance and requirements for dental mercury (U.S. EPA, 2008a).

In 2007 and 2008, EPA focused its efforts on collecting and compiling information on current mercury discharges from dental offices, BMPs, and amalgam separators. For amalgam separators, EPA looked at the frequency with which they are currently used; their effectiveness in reducing discharges to POTWs; and the capital and annual costs associated with their installation and operation (U.S. EPA, 2008a). EPA also conducted a POTW pass-through analysis on mercury for the industry.

EPA received comments from 32 stakeholders on the preliminary 2008 Effluent Guidelines Program Plan. Most commenters were from pretreatment programs that provided useful information on their mandatory and voluntary pretreatment programs that include the use of amalgam separators. EPA used this information to update its final report on management and best practices for the control of dental mercury (U.S. EPA, 2008a). ADA and NACWA commented that although they do not support development of national pretreatment standards, they are willing to work with one another and EPA to increase the use of amalgam separators by dental facilities. EPA is exploring options with ADA and NACWA to promote the use of amalgam separators.

In response to mercury water quality and pollution prevention concerns, there is progress at the State and local level as amalgam separators and other BMPs are increasingly being mandated by States and local governments. ADA's recently revised BMPs will likely help in convincing dentists to install amalgam separators and employ other BMPs to recover dental amalgam and prevent the discharge of mercury to POTWs. This will help POTWs reduce the amount of mercury in their biosolids and the potential for mercury emissions when biosolids are incinerated. Additionally, due to mercury-free fillings and improved overall dental health, the use of mercury in dentistry is decreasing in the U.S. (U.S. EPA, 2008a).

At this time EPA is not identifying this sector for an effluent guidelines rulemaking. As previously noted above, industrial categories demonstrating significant progress through voluntary efforts to reduce hazard to human health or the environment associated with their effluent discharges are a lower priority for effluent guidelines or pretreatment standards revision, particularly where such reductions are achieved by a significant majority of individual facilities in the industry. As an example, in the final 2006 Effluent Guidelines Program Plan EPA relied on a national voluntary partnership program for the industrial laundries sector as a factor in not identifying the industrial laundries sector for an effluent guidelines rulemaking (Section 19.9 of U.S. EPA, 2006b). In future annual reviews, EPA will continue to examine the percentage of dentists using amalgam separators and their effectiveness at recovering dental amalgam and reducing mercury discharges to POTWs. EPA notes ADA's recent positive step in revising their BMPs to include the recommendation for dentists to use amalgam separators. In particular, EPA will examine whether a significant majority of dentists are utilizing amalgam separators. After such examination, EPA may re-evaluate its current view not to initiate an effluent guidelines rulemaking for this sector.

13.2 Unused Pharmaceuticals

To date, scientists have identified more than 160 pharmaceutical compounds at discernable concentrations in our nation's rivers, lakes, and streams (Section 3 of U.S. EPA, 2008b). EPA is very concerned about these findings. To address this issue at the source, EPA is studying how the drugs are entering our waterways and what factors contribute to the current situation. Towards this end, EPA initiated a study on pharmaceutical disposal practices at health care facilities, such as hospitals, hospices, long-term care facilities, and veterinary hospitals. Unused pharmaceuticals include dispensed prescriptions that patients do not use as well as materials that are beyond their expiration dates. Another potential source of unused pharmaceuticals is the residuals remaining in used and partially used dispensers, containers, and devices. Many of these dispensers, containers, and devices are bulky and are likely not disposed to the sewer as they could create blockages in the sewer; however, some might be sewered (e.g., medical patches). As a point of clarification, the term "unused pharmaceuticals" does not include excreted pharmaceuticals.

For many years, a standard practice at many health care facilities was to dispose of unused pharmaceuticals by flushing them down the toilet or drain. Through this study, EPA seeks to investigate the following questions:

- What are the current industry practices for disposing of unused pharmaceuticals?
- Which pharmaceuticals are being disposed of and at what quantities?
- What are the options for disposing of unused pharmaceuticals other than down the drain or toilet?
- What factors influence disposal decisions?
- Do disposal practices differ within industry sectors?
- What BMPs could facilities implement to reduce the generation of unused pharmaceuticals?

- What reductions in the quantities of pharmaceuticals discharged to POTWs would be achieved by implementing BMPs or alternative disposal methods?
- What are the costs of current disposal practices compared to the costs of implementing BMPs or alternative disposal methods?

In a related effort, EPA also seeks to determine the effectiveness with which POTWs can remove pharmaceuticals from incoming sewage. Upon completion of the health services study, EPA hopes to understand what factors contribute to unused pharmaceutical disposal methods at health service facilities and which disposal methods represent best practices to minimize environmental impacts.

To date, EPA has completed an interim study of the health services industry (U.S. EPA, 2008b). To gather data for the study, EPA completed site visits to two hospitals and a pharmaceutical reverse distributor; investigated secondary data sources such as existing institutional surveys on disposal practices; and conducted a series of meetings and teleconferences with other Federal agencies and health care stakeholder groups.

The study focused on hospitals and long-term care facilities (LTCFs) because these facilities are likely responsible for the largest amounts of unused pharmaceuticals being disposed into sewage collection systems within this industry sector. In 2005, there were about 7,000 hospitals and 35,000 LTCFs in the United States (U.S. EPA, 2008b).

EPA's preliminary findings include:

- *Hospitals and long-term care facilities have limited disposal options for unused pharmaceuticals.* Limitations include Federal regulations, state regulations, non-regulatory factors such as ease of disposal and costs, and difficulties encountered during implementation of pharmaceutical take-back programs.
- *Some federal regulations may inadvertently encourage disposal of unused pharmaceuticals via the sewer.* The Controlled Substances Act (CSA), enforced by the Drug Enforcement Administration (DEA), establishes a closed distribution system for controlled substances. The CSA prohibits the return of controlled substances from end-users to any person except, in certain cases, a law-enforcement agent and CSA registrants. Disposal of controlled substances by CSA registrants is carefully regulated to ensure that the substance is destroyed or rendered unrecoverable. One acceptable method of destruction is witnessed disposal of controlled substances in a drain or toilet.
- *Some unused pharmaceuticals are regulated as hazardous wastes and subject to the nation's hazardous waste disposal requirements.* Pharmaceutical wastes may be hazardous waste (under the Resource Conservation and Recovery Act (RCRA)) if they are: (1) the pharmaceutical or its sole active ingredient is specifically listed in 40 CFR part 261.33(e) or (f) (commonly referred to as the P or U lists, respectively); and/or (2) the waste exhibits one or more characteristics of hazardous waste (ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR parts 261.21-24, respectively). Common pharmaceutical wastes that are RCRA hazardous waste when disposed of include epinephrine, nitroglycerin,

warfarin, nicotine, and some chemotherapeutic agents.[20] Healthcare facilities must determine if these wastes are RCRA hazardous wastes, and if so, must comply with all applicable RCRA Subtitle C requirements, including many special handling and transportation requirements.

- *State regulations vary widely and influence disposal practices.* State regulations of the disposal of unused pharmaceuticals and controlled substances vary widely (The Lewin Group, 2004; APhA, 2006). Many state regulations require both hospitals and LTCFs to destroy unused pharmaceuticals but often do not specify the process of destruction; however, many states (33 states according to APhA, 2006) have requirements for the types of facility personnel required to conduct and oversee the destruction. Some states have hazardous waste regulations that are more stringent than EPA (AAEVT, 2006). For example, some wastes are regulated as hazardous under state law but not RCRA (Table 4-1 of U.S. EPA, 2008b). State regulations for reuse of medications vary widely. Many states allow re-use of uncontaminated pharmaceuticals (excluding controlled substances) that have been in a controlled environment, such as an automatic dispensing system (The Lewin Group, 2004). At least five states strictly prohibit hospitals and LTCFs from reusing pharmaceuticals entirely. These states include Arizona, Kentucky, Mississippi, New Mexico, and Texas. California allows county health departments to collect unused pharmaceuticals from LTCFs, wholesalers, and manufacturers and redistribute them for dispensing to the uninsured poor. Some State Medicare and Medicaid requirements often deter LTCFs from donating or redistributing their unused medications (Hessanauer, 2007).
- *Medicare and Medicaid requirements also influence hospital disposal practices.* The Centers for Medicare and Medicaid Services (CMS), the federal agency within the Department of Health and Human Services, administers the Medicare and Medicaid programs. Medicare provides health insurance to elderly and disabled Americans, while Medicaid provides health insurance for low income Americans, including long-term care coverage (CMS, Unknown). In a March 22, 2006 letter, CMS provided guidance to State Medicaid programs encouraging states to require LTCFs to return unused medications to pharmacies and to ensure Medicaid is repaid for unused treatments when nursing home patients die, are discharged, or have their prescriptions changed. In addition, some state Medicaid programs require LTC pharmacies to accept returned unused pharmaceuticals (excluding controlled substances) from LTCFs. The LTC pharmacy then credits Medicaid for the unused doses. However, LTC pharmacies typically receive little payment for these return services and have not found them to be cost effective. For example, when a pharmacy takes back a previously dispensed medication for disposal, it must pay to have the medication destroyed, but it is not compensated for this service (The Lewin Group, 2004). Therefore, few LTC pharmacies participate in these programs.
- *Organization size, ease of disposal and cost are also factors influencing the disposal of unused pharmaceuticals.* Some facilities use flushing to sewers as a primary means of disposal since it is both easy and complies with CSA

[20] The Agency clarified its regulation at 40 CFR 261.33, explaining that epinephrine salts are not included in the epinephrine P042 listing (since the listing only specifies epinephrine and not epinephrine salts); the salts, therefore, would be hazardous only if the waste epinephrine salt exhibited one or more of the hazardous waste characteristics (Hale, 2007).

requirements for destruction. Facilities are most likely to flush pharmaceuticals if they do not have an on-site pharmacy and/or do not have a pre-existing contract with a hazardous waste hauler to dispose of the pharmaceuticals. In the past, public health agencies and health-related non-government organizations guided the public to destroy unused medications by flushing them down the toilet. Many LTCFs have adopted this method for destruction of unused controlled substances. Many LTCFs have also extended this practice to include flushing all unused medications – controlled and non controlled substances (Garvin, 2007).

- *Logistics for disposing of unused pharmaceuticals at hospitals are different from long-term care facilities.* Hospitals typically have on-site pharmacies. It is common practice at hospitals to return some unused pharmaceuticals to the hospital pharmacy and then on to the manufacturer for credit or disposal. However, this option extends only to those pharmaceuticals for which the hospital can receive credit and does not include unused pharmaceuticals that are considered waste (*e.g.*, pharmaceuticals in an intravenous bag, drug samples brought into the hospital). Also, hospitals typically do not prescribe medication far in advance or in large quantities. As a result, the potential for pharmaceuticals to be wasted is reduced. In addition, hospitals typically have pre-existing arrangements for disposal of unused pharmaceuticals as hazardous waste (Garvin, 2007).
- *Widespread implementation of best management practices may reduce the number and quantity of unused pharmaceuticals entering in our nation's waters from disposal.* Three organizations provide guidance in the form of BMPs to medical facilities on managing pharmaceutical waste: Hospitals for a Healthy Environment (H2E), Product Stewardship Institute (PSI), and Joint Commission on Accreditation of Healthcare Organizations (JCAHO). The guidelines provided by these organizations all aim to reduce health and environmental impacts due to current disposal practices of pharmaceutical waste, as discussed in Section 5.2 of the *Health Services Industry Detailed Study: Management and Disposal of Unused Pharmaceuticals (Interim Technical Report)* (U.S. EPA, 2008b). Examples of model BMPs identified to date include waste minimization and reverse distribution systems used by hospitals in California, Minnesota, and Washington. Waste minimization techniques include maintaining inventories of high-use pharmaceuticals and identifying those that are close to expiring. Short-dated pharmaceuticals are redistributed to other areas of the hospitals where they are needed. Also, dispensed pharmaceuticals can go unused at a hospital or LTCF if the patient has an allergic or adverse reaction to the medication, no longer requires treatment, refuses treatment, or the medication expires. Hospitals and LTCFs can reduce the amount of pharmaceutical waste generated by limiting the amount of pharmaceuticals dispensed to patients and residents at one time. This can be accomplished by using unit dose packaging, limited quantity dispensing, automatic dispensing systems and standardized medication dosages, as discussed in Section 5.2 of the *Health Services Industry Detailed Study: Management and Disposal of Unused Pharmaceuticals (Interim Technical Report)* (U.S. EPA, 2008b). Hospitals and LTCFs have the option of hiring reverse distributors to manage their unused and/or expired medication that the facility believes could be returned to the manufacturer or wholesaler for credit. The reverse distributor determines which medications may be returned to the manufacturer or wholesaler

for credit and arranges for disposal of unused medications that are waste. However, there are CSA limitations for reverse distributors and controlled substances. In most cases, reverse distributors cannot handle controlled substances.

EPA is concerned about pharmaceuticals in the environment and is working on this issue in many different areas. Over the last few years, EPA has increased its work in a number of areas to better understand pharmaceuticals. EPA has an overall strategy to address the risks associated with emerging contaminants. This four-pronged strategy is aimed at improving science, improving public understanding, identifying partnership and stewardship opportunities, and taking regulatory action as appropriate. We are focused on learning more about the occurrence and health effects of pharmaceuticals in water. In addition, we are working to better understand what treatment technologies may remove them from wastewater and drinking water. We are developing analytical methods to improve detection capabilities. We are conducting national studies and surveys to help direct our course of action. We are also partnering with government agencies, stakeholders, and the private sector, and increasing public awareness about product stewardship and pollution prevention (Grumbles, 2008). Additionally, the Agency is considering amending its hazardous waste regulations to add hazardous pharmaceutical wastes to the universal waste system to facilitate its oversight of the disposal of pharmaceutical waste (40 CFR 273) (72 FR 23170, April 30, 2007). In addition, the inclusion of hazardous pharmaceutical wastes in the universal waste rule will also encourage health care facilities to manage all their pharmaceutical wastes as universal wastes, even wastes that are not regulated as hazardous but which nonetheless pose hazards. Finally, EPA has identified the issue of pharmaceuticals in wastewater is part of the Agency's Strategic Plan (2006-2011) to meet its goals of clean and safe water.[21]

EPA continues to study the issue of how health care facilities are managing and disposing of unused pharmaceuticals and POTW treatment effectiveness in an effort to identify the root cause and potential solutions to address the issue of pharmaceuticals in our waterways. Over the coming year, EPA will need to gather more technical and economic information on unused pharmaceutical management in the Health Services Industry. To aid its decision-making, EPA intends to submit an Information Collection Request (ICR) to the Office of Management and Budget for their review and approval under the Paperwork Reduction Act, 33 U.S.C. 3501, et seq., in the 2009 annual review. EPA will use this ICR to collect technical and economic information on unused pharmaceutical management and identify technologies and BMPs that reduce or eliminate the discharge of unused pharmaceuticals to POTWs. In designing this industry survey EPA expects to work closely with industry representatives from hospitals, hospices, long-term care facilities, veterinary hospitals and other affected stakeholders. EPA has published a separate Federal Register notice for this ICR and solicits comment on the potential scope of this ICR (73 FR 46903, August 12, 2008).

EPA also plans to conduct additional site visits to facilities to obtain more detailed information on how pharmaceuticals are managed, tracked, and disposed as well as influences on behavior. In addition, EPA is considering collecting data from other types of health care facilities (e.g., medical and dental offices, university and prison health clinics, and veterinary clinics).

[21] See "2006 - 2011 EPA Strategic Plan," http://www.epa.gov/ocfo/plan/plan.htm.

EPA is also reviewing studies on POTW effectiveness. EPA remains very concerned about this issue and plans to expedite completion of this study.

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14.0 OIL AND GAS EXTRACTION CATEGORY (PART 435)

EPA identified the coalbed methane (CBM) sector as a candidate for a detailed study in the final 2006 Effluent Guidelines Program Plan (71 FR 76656, December 21, 2006). As part of that announcement EPA made it clear that it would conduct data collection through an information collection request (ICR) to support this detailed study. In accordance with the Paperwork Reduction Act EPA must seek Office of Management and Budget (OMB) approval for an ICR. EPA also provided notice of this ICR in the preliminary 2008 Effluent Guidelines Program Plan (72 FR 61343, October 30, 2007) and in two separate Federal Register notices (73 FR 4556, January 25, 2008; 73 FR 40757, July 15, 2008). EPA is conducting this detailed study and data collection to determine whether it would be appropriate to initiate an effluent guidelines and limitations (ELGs) rulemaking to control pollutants discharged in coalbed methane (CBM) produced water.

CBM extraction requires removal of large amounts of water from underground coal seams before CBM can be released. CBM wells have a distinctive production history characterized by an early stage when large amounts of water are produced to reduce reservoir pressure which in turn encourages release of gas. This is followed by a stable stage when quantities of produced gas increase as the quantities of produced water decrease; and a late stage when the amount of gas produced declines and water production remains low (De Bruin, et al, 2001). The quantity and quality of water that is produced in association with CBM development varies from basin to basin, within a particular basin, from coal seam to coal seam, and over the lifetime of a CBM well.

Pollutants often found in these wastewaters include chloride, sodium, sulfate, bicarbonate, fluoride, iron, barium, magnesium, ammonia, and arsenic. Total dissolved solids (TDS) and electrical conductivity (EC) are bulk parameters that States typically use for quantifying and controlling the amount of pollutants in CBM produced waters.

Controlling the sodicity of the CBM produced waters is equally important in preventing environmental damage. Sodicity is often quantified as the sodium adsorption ratio (SAR), which is expressed as the ratio of sodium ions to calcium and magnesium ions. Sodicity is an important factor in controlling the produced water's suitability for irrigation as sodic soils are subject to severe structural degradation and restrict plant performance through poor soil-water and soil-air relations. All of these dissolved inorganic parameters can potentially affect environmental impacts as well as potential beneficial uses of CBM produced water.

Impacts to surface water from discharges of CBM produced waters can be severe depending upon the quality of the CBM produced waters. These discharges have variable effects depending on the biology of the receiving stream. Some waterbodies and watersheds may be able to absorb the discharged water while others are sensitive to CBM produced water discharges. For example, large lakes or rivers with sufficient dilution capacity or marine waters are less sensitive to saline discharges than smaller receiving water bodies. Discharge of these CBM produced waters may also cause erosion and in some cases irreversible soil damage from elevated TDS concentrations and SAR values. This may limit future agricultural and livestock uses of the water and watershed.

Currently, regulatory controls for CBM produced waters vary from State to State and permit to permit (De Bruin, et al, 2001). There is very limited permit information (e.g., effluent limits, restrictions) in EPA's Permit Compliance System and Toxics Release Inventory for this industrial sector. Consequently, EPA is gathering additional information from State National Pollutant Discharge Elimination System permit programs and industry on the current regulatory controls across the different CBM basins.

CBM extraction activities accounted for about 10 percent of the total U.S. natural gas production in 2006 and are expanding in multiple basins across the United States. Currently, the Department of Energy's Energy Information Administration expects CBM production to remain an important source of domestic natural gas over the next few decades.

As discussed in Section 3.2.1, EPA's review of existing ELGs considers four factors:

1. Pollutants discharged in an industrial category's effluent;
2. Current and potential pollution prevention and control technology options;
3. Category growth and economic considerations of technology options; and
4. Implementation and efficiency considerations of revising existing effluent guidelines or publishing new effluent guidelines.

EPA will use the CBM ICR to collect technical and economic information from a wide range of CBM operations to address these factors in greater detail (e.g., geographical and geologic differences in the characteristics of CBM produced waters, environmental data, current regulatory controls, availability and affordability of treatment technology options). Response to EPA's questionnaire is mandatory for recipients and EPA will administer the questionnaire using its authority under Section 308 of the CWA, 33 U.S.C. 1318.

In 2007 and 2008, EPA worked with a range of stakeholders (e.g., industry representatives; Federal, State, and Tribal representatives; public interest groups and landowners; and water treatment experts) to obtain information on the industry and its CBM produced water management practices. EPA's outreach started with teleconferences and then continued with a series of meetings and site visits in the major CBM basins. In total, EPA contacted over 700 people in eight states during more than 60 outreach and data collection activities in 2007 and 2008 (e.g., meetings, teleconferences, site visits) (Johnston, 2008; U.S. EPA, 2008a). EPA also solicited public comment through two separate Federal Register notices on the draft survey and supporting statement (73 FR 4556, January 25, 2008; 73 FR 40757, July 15, 2008). This outreach helped the development of the ICR as EPA incorporated data, comments, and suggestions from industry and other stakeholders into the questionnaire. EPA intends to distribute the two-phased questionnaire to industry within a few months of OMB approval (see Section 5(d) of U.S. EPA, 2008b). EPA will process the survey data it collects and plans to present preliminary results on available and affordable technology options in the preliminary 2010 Effluent Guidelines Program Plan.

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15.0 STEAM ELECTRIC POWER GENERATING CATEGORY (PART 423)

The Steam Electric Power Generating Effluent Guidelines and Limitations (ELGs) (40 CFR 423) apply to a subset of the electric power industry, namely those facilities "primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium" (see 40 CFR 423.10). EPA's most recent revisions to the ELGs for this category were promulgated in 1982 (see 47 FR 52290, November 19, 1982).

EPA has focused efforts for the 2007/2008 Detailed Study for the Steam Electric Power Generating Category on certain discharges from coal-fired power plants. The study sought to:

1. Characterize the mass and concentrations of pollutants in wastewater discharges from coal-fired steam electric facilities; and
2. Identify the pollutants that comprise a significant portion of the category's TWPE discharge estimate and the corresponding industrial operation.

EPA's previous annual reviews have indicated that the toxic-weighted loadings for this category are predominantly driven by the metals present in wastewater discharges, and that the waste streams contributing the majority of these metals are associated with ash handling and wet flue gas desulfurization (FGD) systems (U.S. EPA, 2006). Other potential sources of metals include coal pile runoff, metal/chemical cleaning wastes, coal washing, and certain low volume wastes. EPA is continuing to collect data for the detailed study through facility inspections, wastewater sampling, a data request that was sent to a limited number of companies, and various secondary data sources (U.S. EPA, 2008c).

EPA's data collection efforts are primarily focused on coal-fired power plants, with particular interest in FGD wastewater treatment, the management of ash sluice water, and water reuse opportunities. EPA's site visit program gathers information on the types of wastewaters generated by coal-fired steam electric power plants, as well as the methods of managing these wastewaters to allow for recycle, reuse, or discharge. EPA conducted site visits at 16 coal-fired power plants and is continuing to identify potential site visit candidates to assess FGD systems using different scrubber designs or sorbents, and facilities operating or planning to install different types of treatment and water reuse options, including facilities achieving zero liquid discharge from their wet FGD operations.

Between July and October of 2007, EPA conducted five sampling episodes to characterize untreated wastewaters generated by coal-fired power plants, including FGD scrubber purge, fly ash sluice, bottom ash sluice, and combined fly- and bottom ash sluice. EPA also collected samples to assess the effluent quality from different types of treatment systems currently in place at these operations. Samples collected during the five episodes were analyzed for metals and other pollutants, such as total suspended solids and nitrogen. Site-specific sampling episode reports are in the docket for the 2008 Plan (ERG, 2008a; ERG, 2008b; ERG, 2008c; ERG, 2008d; ERG, 2008e). These reports discuss the specific sample points and analytes, the sample collection methods used, the field quality control samples collected, and the analytical results for the wastewater samples.

EPA is continuing to identify potential sampling candidates to evaluate additional types of FGD wastewater treatment systems, including advanced biological metals removal processes and chemical precipitation systems. EPA plans to conduct wastewater sampling at one or more additional plants in 2008 or early 2009.

EPA also collected facility-specific information using a data request conducted under authority of CWA Section 308 (U.S. EPA, 2007). In May 2007, EPA distributed this data request to nine companies that operate a number of coal-fired power plants with wet FGD systems. The data request complements the wastewater sampling effort as it requested facility-specific information about wastewaters, and identifies management practices, for facilities not included in EPA's sampling program. EPA received responses in August and October 2007 and characterized operations at 30 coal-fired power plants. EPA conducted technical reviews of the data received and resolved questions with the individual companies before entering the information into a database (U.S. EPA, 2008a; U.S. EPA, 2008c). The data request collected information on selected wastewater sources, air pollution controls, wastewater management and treatment practices, water reuse/recycle, and treatment system capital and operating costs.

The Utility Water Act Group (UWAG) provided EPA with a database that contains selected National Pollutant Discharge Elimination System Form 2C data for 86 coal-fired plants operated by UWAG's member companies, namely those plants that operate wet FGD systems or wet fly ash sluice systems. The database provides facility information, data on facility outfalls, process flow diagrams, wastewater treatment information, and intake and effluent characteristics. Data are provided for the FGD, ash sluice, and coal pile runoff wastestreams (Aldridge, 2008; UWAG, 2008).

EPA is also in the process of contacting vendors and conducting literature searches to collect additional information on wastewater treatment technology options and wastewater reuse opportunities for particular waste streams. The Electric Power Research Institute (EPRI) is conducting bench- and pilot-scale tests on FGD wastewater treatment technologies, including chemical precipitation, ion exchange, and biological metals removal.

EPA intends to continue its detailed review of the Steam Electric Power Generating Category in the 2009 and 2010 annual reviews of effluent guidelines. Wastewater sampling at a facility operating a treatment system of interest was delayed by nearly one year due to operational conditions at the plant. In addition, several other plants recently began operating a new generation of FGD wastewater treatment technology that promises to achieve substantially better pollutant reductions of metals and nutrients than EPA has evaluated to date. EPA believes it is important to evaluate the performance of these technologies, as well as the processes being investigated by EPRI, prior to concluding the detailed study. As noted above, EPA has not yet completed its wastewater sampling activities. The UWAG Form 2C database was recently delivered to EPA; however, EPA has not had sufficient time to fully evaluate this data. The database provides substantial information on wastewater generation and wastewater management and treatment practices for a large number of plants. EPA believes it is important to take additional time to evaluate the Form 2C data, in concert with EPA's sampling data and the responses to EPA's data request. EPA also intends to continue investigating water reuse opportunities to assess the degree to which they may yield pollutant reductions for discharges of ash sluice and FGD wastewater.

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