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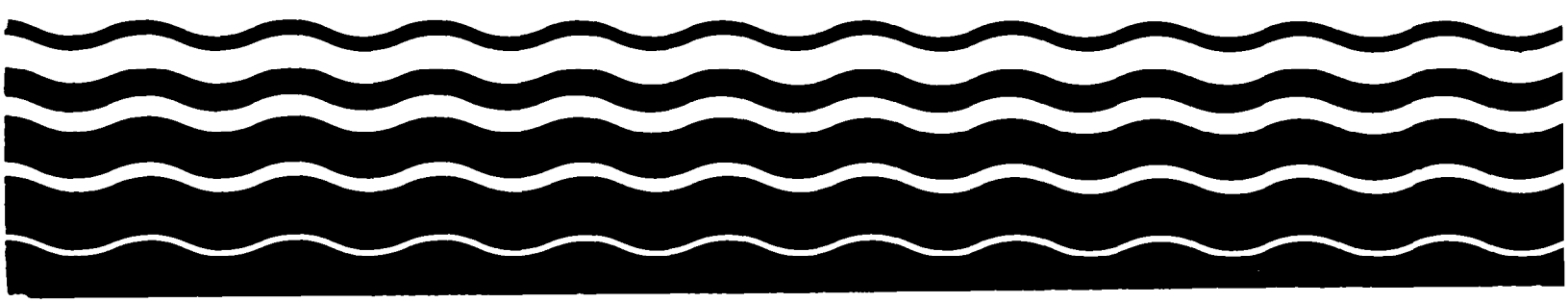
Guidance Manual for Implementing Total Toxic Organics (TTO) Pretreatment Standards



GUIDANCE MANUAL FOR IMPLEMENTING TOTAL TOXIC ORGANICS PRETREATMENT STANDARDS

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1. INTRODUCTION

The National Pretreatment Program establishes an overall strategy for controlling the introduction of nondomestic wastes to publicly owned treatment works (POTWs) in accordance with the overall objectives of the Clean Water Act. Sections 307(b) and (c) of the Act authorize the Environmental Protection Agency to develop national pretreatment standards for new and existing dischargers to POTWs. The Act made these pretreatment standards enforceable against dischargers to publicly owned treatment works.

The General Pretreatment Regulations (40 CFR Part 403) established administrative mechanisms requiring certain POTWs to develop local pretreatment programs to enforce the general discharge prohibitions and specific Categorical Pretreatment Standards. These Categorical Pretreatment Standards are designed to prevent the discharge of pollutants which pass through, interfere with, or are otherwise incompatible with the operation of the POTWs. The standards are technology-based for removal of toxic pollutants and contain specific numerical limitations based on an evaluation of specific technologies for each individual industry category.

Categorical Pretreatment Standards have been or are being established for different categories of industries. Twenty-one of these industrial categories must presently meet numerical limits for certain pollutants that are typically present in the waste discharges from those industries. All categories must comply with the generic prohibited discharge standards specified in 40 CFR 403.5(b) and any local limits established by the POTW in which the industry is located pursuant to the General Pretreatment Regulations.

Six of the industrial categories have a pretreatment standard established for total toxic organics (TTO). The categories affected by a TTO limit are:

- Electroplating
- Metal Finishing
- Electrical and Electronic Components (Phases I and II)
- Copper Forming
- Aluminum Forming
- Coil Coating (Can-Making Subcategory only)

The reason for a TTO limit in each of these categories is that industry studies have shown there is a significant potential for TTO discharge by these industries.

1.1. DEFINITION OF TTO

The TTO is defined as the **sum of the masses** or concentrations **of specific toxic organic compounds found in the industrial user's process discharge at a concentration greater than 0.01 mg/l.** Each Categorical Standard lists the specific toxic organic compounds that are to be included in the summation to define TTO for the category.

1.2. GENERAL ORGANIZATION

This manual will be useful to both POTWs and their indirect dischargers/industrial users (IUs) who are subject to a categorical pretreatment standard for TTO. It will help POTWs by providing them with a better understanding of how to implement the TTO standard and how the alternative provided in each regulation may be useful in lieu of IUs monitoring their TTO discharges to document their compliance status. Through this manual, IUs will understand their reporting responsibilities relative to TTO and the available alternative under the applicable regulation.

Chapter 2, REPORTING REQUIREMENTS, provides information on the various reports which a regulated IU must submit under the General Pretreatment Regulations (40 CFR Part 403). This chapter will be most useful for IUs subject to the Electrical and Electronic Components (Phase I and II), the Copper Forming, the Aluminum Forming, and the Coil Coating regulations. Industrial users subject to the Electroplating and Metal Finishing regulations, have already received similar guidance in the Guidance Manual for Electroplating and Metal Finishing Pretreatment Standards (February 1984).

Chapter 3, INDUSTRIAL CATEGORIES WITH TTO REQUIREMENTS, discusses each industry category that contains a TTO pretreatment standard. It presents the individual toxic organic compounds which are regulated as a component of TTO, the specific TTO limitations and the applicable compliance date for both existing and new source pretreatment standards. It also discusses the TTO monitoring alternative and potential sources of toxic organics in each category.

Chapter 4, GUIDANCE FOR THE PREPARATION OF A TOXIC ORGANIC MANAGEMENT PLAN, walks an industrial user and a Control Authority through the steps necessary to develop an acceptable management plan.

Chapter 5, USE OF THE COMBINED WASTESTREAM FORMULA, and Chapter 6, REMOVAL CREDITS, discuss the applicability of these two provisions of the General Pretreatment Regulations to TTO pretreatment standards.

Chapter 7, TTO MONITORING GUIDANCE, presents specific guidance on sampling and analyzing TTO and on oil and grease monitoring for the industry categories which provide that TTO monitoring alternative.

1.3. LIMITATIONS OF THIS MANUAL

This manual presents information and guidance only on the implementation of categorical pretreatment standards for TTO. It does not deal with any problems or issues related to any individual toxic organic compounds regardless of whether they are regulated as a TTO component. These more specific, localized problems are better addressed on a case-by-case basis by the industrial users and their Control Authority.

2. REPORTING REQUIREMENTS

The General Pretreatment Regulations (40 CFR Part 403) require that indirect dischargers regulated under a National Categorical Pretreatment Standard submit various reports at specified times. Section 403.12 of the General Pretreatment Regulations delineates what reports each regulated indirect discharger must submit, the information to be contained in each report, and when each report must be submitted to the Control Authority. Appendix A contains a copy of Section 403.12. The Control Authority is the indirect discharger's receiving POTW if its pretreatment program has been approved. If the POTW's program has not been approved, the Control Authority is the State if its pretreatment program has been approved or the appropriate EPA Regional Office if the State does not have an approved pretreatment program.

2.1 BASELINE MONITORING REPORT

Under the provisions of Section 403.12 of the General Pretreatment Regulations, all industrial users (IUs) of a publicly owned treatment works (POTW) subject to categorical pretreatment standards are required to submit a Baseline Monitoring Report (BMR).

The BMR must be submitted by an existing source within 180 days after the effective date of an applicable categorical pretreatment standard or within 180 days after the final decision on a category determination request submitted under Section 403.6(a). New sources must submit a report which contains the information delineated in 40 CFR Section 403.12(b)(1) to (5). The term "New source" means any building, structure, facility, or installation from which pollutants are discharged or may be discharged and the construction of which was started after the publication of any proposed applicable pretreatment standard under section 307(c) of the Clean Water Act if such standard is finally promulgated in accordance with section 307(c).

The BMR must contain the name and address of the facility including the name of the operator and owners; a list of environmental control permits held by or for the facility; a brief description [including a flow-diagram of regulated processes] of the nature, average rate of production, and SIC codes of the operations; the measured average daily and maximum daily flow from regulated process streams and other streams as necessary for using the combined wastestream formula; and the results of sampling and analysis identifying the nature and concentration or mass of the regulated pollutants in each regulated process' discharge.

The indirect discharger shall provide the concentration or mass as required by either the pretreatment standard or the Control Authority. Where feasible, the indirect discharger shall use flow proportional composite sampling techniques specified in the applicable standard. If flow metering is not available, then time proportional composite sampling techniques may be used. When composite sampling is not feasible, a grab sample is acceptable.

The BMR shall indicate the time, date, and place of sampling, the methods of analysis, and shall certify that the sampling and analysis is representative of normal work cycles and expected pollutant discharges. Additionally, the BMR shall include an authorized representative's certification, endorsed by a qualified professional, that pretreatment standards are or are not being met on a consistent basis. If not being met, the BMR shall also contain a compliance schedule for implementing additional operation and maintenance (O & M) and/or pretreatment necessary for meeting the applicable standards and requirements.

An authorized representative as a minimum shall be a vice president-level individual if the indirect discharger is a corporation; a general partner or proprietor if the discharger is a partnership or sole proprietorship, respectively; or an authorized representative if the representative is responsible for the facility's operation.

If a regulated indirect discharger is not meeting the applicable pretreatment standards and his BMR contains a compliance schedule, the compliance schedule must contain the shortest schedule by which the industrial user (IU) will provide the additional O & M and/or pretreatment necessary to comply with the standards. The schedule will contain increments of progress for the start and finish of major events leading to construction and operation of the necessary O & M and/or pretreatment. No increment of progress shall exceed 9 months; the completion date shall not be later than the compliance date for the applicable pretreatment standards.

TTO monitoring must be submitted in the BMR for all categorical industries subject to a TTO standard except those facilities that plan to use alternate oil and grease limits provided in the Aluminum Forming, Copper Forming, and Coil Coating regulations.

The General Pretreatment Regulations establish a sampling frequency which IUs must use in preparing their BMRs. The sampling frequency is related to the flow of the stream being sampled. If the flow is less than or equal to 950,000 liters per day (approximately 250,000 gpd), the IU must take three samples within a two-week period. If the flow is greater than 950,000 liters/day (approximately 250,000 gpd), the IU must take six samples within a two-week period.

2.2 PROGRESS REPORTS

No later than 14 days following each date in its compliance schedule and the final compliance date, the IU must submit a progress report to the Control Authority. The report must state whether or not it complied with the increment of progress to be met. If the increment step was not met, the report must further state when that step will be finished, the reason for the delay, and the steps which will be taken by the IU to get back on schedule.

IUs can not exceed 9 months between any two progress reports.

These reports will not contain any sampling and analysis results for TTO or any available alternative.

2.3 NINETY-DAY COMPLIANCE REPORT

Section 403.12(d) of the General Pretreatment Regulations requires categorical industrial facilities subject to pretreatment standards to submit a 90-day compliance report to the POTW. This report provides initital verification that the IU is in compliance with the applicable standards and requirements for their discharge. Existing categorical industrial users must file a final compliance report within 90 days following the final compliance date specified in a categorical regulation or within 90 days of the compliance date specified by the Control Authority, whichever is earlier. New source industrial users must file a compliance report within 90 days after the commencement of a discharge to the POTW system.

The contents of this report must include: results of sampling of industrial wastestreams for regulated pollutants; average and maximum daily flow for industrial process wastewaters being regulated; a statement of compliance; and, where necessary, a statement as to whether additional O & M changes and/or pretreatment equipment are needed to bring the industrial user into compliance.

Control Authorities must require that IUs include in their 90-day compliance report the results of their sampling and analysis for TTO unless an alternative oil and grease limitation is provided and adopted. If an IU elects to use an alternative oil and grease limitation, then the 90-day compliance report must contain results of oil and grease sampling and analysis. An authorized representative as discussed above must sign this report. Additionally, a qualified professional must certify the report.

For the 90-day compliance report, Control Authorities should require that their regulated IUs use the sampling frequency specified for BMRs in 40 CFR Section 403.12(b)(5)(iv).

2.4 INDUSTRIAL USER SEMI-ANNUAL COMPLIANCE REPORTS

The General Pretreatment Regulations require categorical industrial users to report the results of self-monitoring of their regulated waste discharges to the Control Authority at least semi-annually. The regulations [Section 403.12(e)(1)] state that the reports are to contain information "indicating the nature and concentration of pollutants in the effluent which are limited by such Categorical Pretreatment Standards. In addition, this report shall include a record of measured or estimated average and maximum daily flows for the reporting period..." The reports must be submitted at least semi-annually in June and December.

However, the regulations state that the Control Authority may at its discretion alter the specific months during which the self-monitoring reports are due to account for such factors as high or low flow rates, budget cycles, holidays, etc.

In all cases, the self-monitoring reports should be required to be submitted within fifteen calendar days of the date on which the last sample analysis is received. The report should include all self-monitoring data for the semi-annual period just ended.

At a minimum, the following information should be reported to the Control Authority:

- Date the sample and flow measurement was taken
- Results of analysis for all required parameters
- Other information (unusual process or operating conditions, equipment, problems, etc.) that may affect sample results
- Signed statement of accuracy by an authorized representative.

In these reports, the IU is not required to submit the results of TTO monitoring and analysis to demonstrate continued compliance with the applicable TTO pretreatment standard if he elects to use the applicable alternative available to his facility. Where TTO monitoring is required, the Control Authority will establish the required monitoring frequency.

3. INDUSTRIAL CATEGORIES WITH TTO REQUIREMENTS

This chapter presents information concerning the TTO limits, alternatives to the requirement for TTO monitoring (where available) and brief discussions of potential sources of the regulated toxic organics within each category affected by a TTO standard. Each category with a TTO standard is addressed. Discussion of the Electroplating and Metal Finishing categories is combined as is the discussion of the Electrical and Electronic Components Phase I and Phase II categories because of the similarity of operations and standards.

3.1 ELECTROPLATING AND METAL FINISHING

3.1.1 TTO Limits

The Electroplating/Metal Finishing regulations include a TTO pretreatment standard. Appendix B contains a list of the individual toxic organic compounds which must be included in the TTO summation when they are present in a regulated wastestream in a concentration greater than 0.01 mg/l. Industrial users subject to these regulations must sample and analyze their wastestreams for TTO and report the results of this TTO monitoring in their BMRs and in their 90-day compliance report. However, these IUs are only required to sample and analyze for those individual compounds listed in Appendix B which would reasonably be expected to be present in their wastestream. This is in accordance with 40 CFR Section 413.03(c) and 40 CFR Section 433.12(a) of the Electroplating and Metal Finishing Regulations, respectively.

Before regulated IUs conduct any BMR and 90-day compliance report monitoring for TTO, they should seek their Control Authority's agreement on which of the individual toxic organics listed in Appendix B can reasonably be expected to be present in their regulated wastestreams. Control Authorities should require that their regulated IUs support with appropriate documentation their determination of reasonably expected presence. Appropriate documentation may include a new material inventory, an engineering study, and/or a process balance.

The following table gives the TTO pretreatment standards for the Electroplating and Metal Finishing categories and the applicable compliance date for each.

Industry Category	Limit (Daily Maximum) (mg/l)	Compliance Date
Electroplating		
≤ 10,000 gpd	4.57	July 15, 1986
> 10,000 gpd	2.13	July 15, 1986
Metal Finishing		
Interim	4.57	June 30, 1984
Final	2.13	February 15, 1986

3.1.2 Alternative to TTO Monitoring

Rather than monitor TTO, IUs may request that their Control Authority allow them to make the following certification:

> "Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for total toxic organics (TTO), I certify that to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewater has occurred since filing of the last semi-annual compliance report. I further certify that this facility is implementing the solvent management plan submitted to the Control Authority."

The IUs must include this certification in each semi-annual compliance report which they submit to their Control Authority. The IUs' use of the certification statement is solely at their Control Authority's discretion.

When requesting to use this certification as an alternative to TTO monitoring the IUs must submit a toxic organic management plan (TOMP) that satisfies the Control Authority regarding:

(1) the identification of the toxic organics listed in Appendix B which the IU uses;

(2) the method of disposal, such as incineration, contract hauling, or reclamation; and

(3) procedures for assuring that toxic organics do not routinely spill or leak into the wastestream.

The IUs must submit and implement this TOMP as early as possible in order to demonstrate that it will provide the degree of control necessary for the IU to achieve compliance with the TTO pretreatment standard. Chapter 4 presents guidance on the development of a TOMP. Appendix D is an example of such a plan.

However, if the Control Authority samples and analyzes its IUs' wastestream to confirm compliance with an applicable TTO pretreatment standard and the results show non-compliance, the Control Authority can require that the IU initiate TTO sampling and analysis on a frequency which the Control Authority establishes.

The Control Authority must also require that the IU take the remedial actions necessary to come into compliance with the applicable TTO standard as expeditiously as possible.

3.1.3 Sources of Toxic Organics

Toxic organics are used extensively in electroplating and metal finishing processes. The list of regulated toxic organics includes 110 compounds, as noted in Appendix B. The main sources of the toxic organics generated by these industries are primarily from the dumping of spent solvents or dragout of organic compounds used in degreasing and paint stripping operations. Other sources may include parts washing and various surface preparation and painting operations. Degreasing, however, is the most prevalent source.

Both production/process areas and storage areas are potential sources for the introduction of toxic organics into the POTW sewer system. Production/process introductions can be in the form of solvent rinse dragout, spray/mist wash runoff, paint booth runoff, and spent solvent dumping. Storage area toxic organic introductions can occur from spills which enter floor drains. The dumping of spent, contaminated or unwanted solvents into the sewer system is also a significant source.

Industrial users have the responsibility to identify the toxic organic constituents of any solvents and degreasers that use commercial or trademark names and do not list the actual chemical name(s). Control Authorities may verify that its IUs' commercial degreasers and solvents do not contain any toxic organics by requesting that the IUs submit a list of components for any commercial or trademark solvents and degreasers which they may use.

Table 3.1 presents some examples of halogenated and non-halogenated toxic organic compounds which may be found in commercial grade solvents and degreasers.

TABLE 3.1
Example Toxic Constituents of
Organic Solvents

Halogenated Solvent Constituents

Di,tri,tetra-chloromethanes
Di,tri,tetra-chloroethanes
Di,tri,tetra-chloroethylenes
Chlorinated Benzenes
Methylene Chloride

Non-Halogenated Solvent Constituents

Benzene
Phenol
Nitrobenzene
Ethylbenzene
Toluene
Acrylonitrile
Napthalene

3.2 ELECTRICAL AND ELECTRONIC COMPONENTS (PHASES I AND II)

3.2.1. TTO Limits

The Electrical and Electronic Components category has four subcategories: (a) Semiconductors, (b) Electronic Crystals, (c) Cathode Ray Tubes, and (d) Luminescent Materials. Semiconductors, Electronic Crystals, and Cathode Ray Tubes all have TTO limits. The remaining subcategory, Luminescent Materials, has no TTO restrictions. The following table gives the limitation and compliance date for each regulated subcategory.

Subcategory	Limit (Daily Max.) (mg/l)[1]	Compliance Date
Semiconductors	1.37	July 1, 1984
Electronic Crystals	1.37	July 1, 1984
Cathode Ray Tubes	1.58	July 14, 1986

[1] Limits in each subcategory apply to both new and existing sources in that subcategory.

The specific toxic organic compounds regulated as TTO are delineated in Appendix C. These compounds must be included in the TTO summation when they are present in a regulated wastestream in concentrations greater than 0.01 mg/l. Additionally, IUs in these subcategories must sample and analyze for all the toxic organics listed in Appendix C. They may not limit their testing to those toxic organics reasonably expected to be present in their regulated wastestreams. The Agency has already determined that all these pollutants are reasonably expected to be present. Regulated IUs must report the results of their TTO sampling and analysis in their BMRs and in their 90-day compliance reports. The applicable sampling frequency for these two reports is found in Sections 2.1 and 2.3, respectively, of this manual.

3.2.2 Alternative to TTO Monitoring

Industrial users as an alternative to monitoring TTO to determine compliance with the applicable standard may certify with the Control Authority's approval that there has been no dumping of concentrated toxic organics into the wastewater and that it is implementing the solvent management plan submitted to the Control Authority.

The regulated IUs must submit this certification as a comment to their semi-annual compliance reports. The specific certification language is found in 40 CFR Section 469.13(c) and the requirement that the IUs electing to use this certification submit and then implement a solvent managment plan is found in 40 CFR Section 469.13(d). The specific certification language is as follows:

> "Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for total toxic organics (TTO), I certify that to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewater has occurred since filing of the last semi-annual compliance report. I further certify that this facility is implementing the solvent management plan submitted to the Control Authority."

3.2.3 Sources of Toxic Organics

Toxic organics are used similarly in the three regulated subcategories. They appear almost exclusively as constituents of solvents. These solvents are used in cleaning, degreasing, and some etching operations. Both production/process areas and storage areas are potential sources for the introduction of toxic organics into the POTW sewer system. Production/process introductions can be in the forms of solvent rinse dragout, spray/mist wash runoff, etching solution dumping, and spent solvent dumping. Storage area toxic organic introductions can occur from spill entry via floor drains and dumping of spent or unwanted solvents in the sewer system.

Industries are responsible for identifying the toxic organic constituents in any solvents that use commercial or trademark names and do not list the actual chemical name(s).

3.3 COPPER FORMING

3.3.1 TTO Limits

Copper forming consists of five basic processes used to form copper or copper alloys: hot rolling, cold rolling, extrusion, drawing, and forging. These are the core processes; ancillary operations consist of annealing with oil or water, pickling, alkaline cleaning, solution heat treatment, tumbling, burnishing, surface coating, hydrotesting, surface milling and sawing.

The toxic organic compounds identified as comprising TTO under the categorical standards for copper forming are:

Benzene	Napthalene
1,1,1-Trichloroethane	N-nitrosodiphenylamine
Chloroform	Anthracene
2,6-dinitrotoluene	Phenanthrene
Ethylbenzene	Toluene
Methylene chloride	Trichloroethylene

The final compliance date for the pretreatment standards for existing sources is August 15, 1986; new sources must comply on the date they begin operation.

Table 3.2 presents the TTO pretreatment standards for both existing and new sources for each of the regulated core processes and ancillary operations. Regulated IUs subject to this regulation must sample and analyze for all the above compounds unless they elect to use the oil and grease alternative; they can not sample and analyze for those compounds which are reasonably expected to be in their wastestreams. IUs must submit their TTO or oil and grease sampling and analysis results in their BMRs and in their 90-day compliance reports. The applicable sampling frequency for these two reports is found in Sections 2.1 and 2.3 of the manual, respectively. Monitoring frequency for TTO or oil and grease in their semi-annual compliance reports will be established by the Control Authority.

Section 468.01(b) of the Copper Forming regulation limits the applicability of the existing source and new source pretreatment standards for drawing spent lubricant discharges (40 CFR Section 468.14(c) and 468.15(c)). These standards only apply to those copper forming facilities which actually discharge this spent lubricant wastestream to their POTW. These standards do not apply when this spent lubricant is hauled off-site for disposal or is otherwise not discharged from the facility.

TABLE 3.2

COPPER FORMING CATEGORY
TTO AND OIL AND GREASE STANDARDS

Subpart A	Mg/Off-Kg or lbs/Million off-lbs of copper or copper alloy	PSES				PSNS			
		TTO		Oil & Grease		TTO		Oil & Grease	
		Max. for any 1 day	Monthly max. aug.	Max. for any 1 day	Monthly max. aug.	Max. for any 1 day	Monthly max. aug.	Max. for any 1 day	Monthly max. aug.
a. Hot Rolling Spent Lubricant	hot rolled	0.066	0.035	2.060	1.236	0.035		1.030	
b. Cold Rolling Spent Lubricant	cold rolled	0.246	0.128	7.580	4.548	0.128		3.790	
c. Drawing Spent Lubricant	drawn	0.055	0.028	1.700	1.020	0.028		0.850	
d. Solution heat treatment	heat treated	0.419	0.219	12.920	7.752	0.219		6.460	
e. Extrusion heat treatment	heat treated on an extrusion press	0.0010	0.00068	0.040	0.024	0.00068		0.020	
f. Annealing with Water	annealed with water	0.806	0.421	24.8000	14.880	0.421		12.400	
g. Annealing with Oil	annealed with oil	0	0	0	0	0		0	
h. Alkaline Cleaning Rinse	alkaline cleaned	2.739	1.432	84.280	50.568	1.432		42.140	
i. Alkaline Cleaning Rinse for forged parts	alkaline cleaned	8.217	4.298	252.840	151.704	4.298		126.420	
j. Alkaline Cleaning Bath	alkaline cleaned	0.030	0.015	0.83	0.56	0.015		0.46	
k. Pickling Rinse	pickled	0.848	0.444	26.120	15.672	0.198		5.850	
l. Pickling Rinse for forged parts	forged parts pickled	2.540	1.332	78.360	47.016	0.596		17.550	
m. Pickling bath	pickled	0.075	0.039	2.320	1.392	0.039		1.160	
n. Pickling fume scrubber	pickled	0.406	0.212	12.520	7.512	0.212		6.260	
o. Tumbling or Burnishing	tumbled or burnished	0.378	0.198	11.660	6.996	0.196		5.830	
p. Surface Coating	surface coated	0.482	0.252	14.860	8.916	0.252		7.430	
q. Miscellaneous Wastestreams	formed	0.014	0.007	0.436	0.261	0.007		0.218	

3.3.2 Alternative to TTO Monitoring

As an alternative to TTO monitoring, regulated IUs may monitor for oil and grease (O&G) and meet the O&G monitoring standards. The alternate O&G monitoring standards are included in Table 3.2. The maximum monthly average is the same value as the one-day maximum although the monthly values are not shown in the table. Any IU choosing the alternative O&G monitoring standards is not subject to the Copper Forming TTO standard.

Regulated IUs electing to use this alternative must sample and analyze for O&G and submit these results in their BMRs, their 90-day compliance reports, and their subsequent semi-annual compliance reports.

Additionally, Section 468.03(a) requires that regulated IUs comply with the monthly discharge limit regardless of the number of samples analyzed and averaged.

Sampling frequency for BMRs and for 90-day compliance reports is discussed in Sections 2.1 and 2.3 of this manual. Sampling frequency for the semi-annual compliance report will be established by the Control Authority.

3.3.3 Sources of Toxic Organics

Wastewater from copper forming plants is generated by both the core and ancillary operations. The core operations utilize oil/water emulsions as lubricants to reduce wear on the forming equipment and to prevent adhesion of the copper to the equipment. The spent lubricants become part of the regulated wastestream. Ancillary operations use water and/or oil to cool, clean and rinse the formed metal. Wastestreams from these ancillary operations are also regulated. The lubricants and cleaners used in these operations usually contain one or more of the toxic organics regulated by the Copper Forming regulation as a TTO component.

3.4 ALUMINUM FORMING

3.4.1 TTO Limits

The Aluminum Forming category is divided into six subcategories:

A) Rolling with Neat Oils

B) Rolling with Emulsions

C) Extrusion

D) Forging

E) Drawing with Neat Oils

F) Drawing with Emulsions.

The various processes used by the industry required this division into subcategories based on differences in the methods of production. Each subcategory listed above has pretreatment standards for the core operation and ancillary operations that may be associated with the core process. Each subcategory is discussed separately in this document identifying the core process and noting all sources for contaminated wastestreams.

The toxic organic compounds regulated under the TTO standards for each subcategory are listed below. The term "Total Toxic Organics" for this category is the sum of the masses or concentrations of each of the following toxic organic compounds found at a concentration greater than 0.01 mg/l in a regulated wastestream

p-chloro-m-cresol
2-chlorophenol
2,4-dinitrotoluene
1,2-diphenylhydrazine
ethylbenzene
fluoranthene
isophorone
napthalene
N-nitrosodiphenylamine
phenol
benzo(a)pyrene
benzo(ghi)perylene
fluorene
phenanthrene
dibenzo(a,h)anthracene
indeno(1,2,3,-c,d)pyrene
pyrene
tetrachloroethylene
toluene
trichloroethylene
endosulfan sulfate
bis(2-ethyl hexyl)phtalate
diethylphthalate
3,4-benzofluoranthene
benzo(k)fluoranthene
acenaphthylene
anthracene
chrysene
di-n-butyl phthalate
endrin
endrin aldehyde
PCB 1242, 1254, 1221
PCB 1232, 1248, 1260, 1016
acenaphthene

Table 3.3 presents the applicable TTO limits for each subcategory. The final compliance date for the pretreatment standards for existing sources was October 24, 1983; new sources must comply on the date they begin operating.

The sampling frequency which the regulated IUs must use for TTO or oil and grease sampling for its BMR and 90-day compliance report is specified in Sections 2.1 and 2.3, respectively, of this manual. For these two reports, all the toxic organics listed above must be analyzed for. The IUs will only sample and analyze TTO for inclusion in these reports if they elect, not to use the available alternative described in the next section. If they elect to use the oil and grease alternative, then they must report their oil and grease sampling and analysis results in these reports.

TABLE 3.3

ALUMINUM FORMING CATEGORY
TTO AND OIL AND GREASE STANDARDS

Subpart A: Rolling with Neat Oils	Wastestreams	Mg/Off-Kg or lb/Million off-lb of aluminum	PSES TTO Max. for any 1 day	PSES Oil & Grease-Alternative Parameter Max. for any 1 day	PSES Oil & Grease-Alternative Parameter Max. for Monthly avg.	PSNS TTO Max. for any 1 day	PSNS Oil & Grease - Alternative Max. for any 1 day and Max. for Monthly Average
Core:							
Core without an Annealing Furnace Scrubber	Spent Lubricant	rolled with neat oils	0.057	1.64	0.98	0.057	0.817
Core with an Annealing Furnace Scrubber	Spent Lubricant Scrubber Liquor	rolled with neat oils	0.038	1.11	0.67	0.038	0.54
Degreasing	Spent Solvent	part of core process	--	--	--	--	--
Sawing Operations	Spent Lubricant	part of core process	--	--	--	--	--
Ancillary Processes:							
Continuous Sheet Casting	Spent Lubricant	cast	0.0014	0.040	0.024	0.0014	0.20
Solution Heat Treatment	Contact Cooling Water	quenched	1.41	40.74	24.45	1.41	20.37
Cleaning or Etching Bath	Bath Water	cleaned or etched	0.124	3.58	2.15	0.124	1.79
Cleaning or Etching Rinse	Rinse Water	cleaned or etched	0.96	27.82	16.69	0.96	13.91
Cleaning or Etching Scrubber	Scrubber Liquor	cleaned or etched	1.34	38.7	23.20	1.34	19.33
Subpart B: Rolling with Emulsions							
Core:							
Rolling with Emulsions	Spent Emulsions	rolled with emulsions	0.090	2.60	1.56	0.90	1.30
Sawing	Spent Lubricant	part of core	--	--	--	--	--
Ancillary Processes							
Direct Chill Casting	Contact Cooling Water	cast	0.92	26.58	15.96	0.92	13.28
Solution Heat Treatment	Contact Cooling Water	quenched	1.41	40.74	24.44	1.41	20.37
Cleaning or Etching Bath	Bath Water	cleaned or etched	0.124	3.58	2.15	0.124	1.79
Cleaning or Etching Rinse	Rinse Water	cleaned or etched	0.96	27.82	16.69	0.96	13.91
Cleaning or Etching Scrubber	Scrubber Liquor	cleaned or etched	1.34	38.66	23.20	1.34	19.33

TABLE 3.3 (cont.)

Subpart C: Extrusion	Wastestreams	Mg/Off-Kg or lb/Million off-lb of aluminum	PSES TTO Max. for any 1 day	PSES Oil & Grease-Alternative Parameter Max. for any 1 day	PSES Oil & Grease-Alternative Parameter Max. for Monthly avg.	PSNS TTO Max. for any 1 day	PSNS Oil & Grease - Alternative Max. for any 1 day and Max. for Monthly Average
Core:							
Extrusion	Dummy Block Cooling Water	extruded	0.24	6.78	4.07	0.24	1.40
Extrusion Press Leakage		hard alloy alum. extruded	1.02	29.56	17.74	0.21	2.98
Degreasing	Spent Solvent	part of core	--	--	--	--	--
Sawing	Spent Lubricant	part of core	--	--	--	--	--
Die Cleaning	Bath and Rinse Water Scrubber Liquor	part of core	--	--	--	--	--
Ancillary Processes							
Direct Chill Casting	Contact Cooling Water	cast	0.92	26.58	15.95	0.92	13.29
Press Heat Treatment	Contact Cooling Water	quenched	1.41	40.74	24.45	1.41	20.37
Solution Heat Treatment	Contact Cooling Water	quenched	1.41	40.74	24.45	1.41	20.37
Cleaning or Etching Bath	Bath Water	cleaned or etched	1.24	3.58	2.16	0.124	1.79
Cleaning or Etching Rinse	Rinse Water	cleaned or etched	0.96	27.82	16.69	0.96	13.91
Cleaning or Etching Scrubber	Scrubber Liquor	cleaned or etched	1.34	38.66	23.20	1.34	19.33
Subpart D: Forging							
Core:							
Forging	---	forged	0.035	1.00	0.60	0.035	0.50
Degreasing	Spent Solvent	part of core	--	--	--	--	--
Sawing	Spent Lubricant	part of core	--	--	--	--	--
Ancillary Processes							
Forging Scrubber Liquid	Scrubber Liquor	forged	0.065	1.89	1.13	0.065	0.95
Solution Heat Treatment	Contact Cooling Water	quenched	1.41	40.74	24.45	1.41	20.37
Cleaning or Etching Bath	Bath Water	cleaned or etched	0.123	3.58	2.15	0.124	1.79
Cleaning or Etching Rinse	Rinse Water	cleaned or etched	0.96	27.82	16.70	0.96	13.91
Cleaning or Etching Scrubber	Scrubber Liquor	cleaned or etched	1.34	38.66	23.20	1.34	19.33

TABLE 3.3 (cont.)

Subpart E: Drawing with Neat Oils	Wastestreams	Mg/Off-Kg or lb/Million off-lb of aluminum	PSES TTO Max. for any 1 day	PSES Oil & Grease-Alternative Parameter Max. for any 1 day	PSES Oil & Grease-Alternative Parameter Max. for Monthly avg.	PSNS TTO Max. for any 1 day	PSNS Oil & Grease - Alternative Max. for any 1 day and Max. for Monthly Average
Core:							
Drawing with Neat Oils	Spent Lubricant	drawn with neat oils	0.035	1.00	0.60	0.035	1.94
Degreasing	Spent Solvent	part of core					
Sawing	Spent Lubricant	part of core					
Ancillary Processes							
Continuous Rod Casting	Spent Lubricant	rod cast	0.0014	0.40	0.024	0.0014	0.020
Continuous Rod Casting	Contact Cooling Water	rod quenched	0.133	3.878	0.134	0.072	1.04
Solution Heat Treatment	Contact Cooling Water	rod quenched	1.41	40.74	24.45	1.41	20.37
Cleaning or Etching Bath	Bath Water	cleaned or etched	0.124	3.58	2.15	0.124	1.79
Cleaning or Etching Rinse	Rinse Water	cleaned or etched	0.96	27.82	16.70	0.96	13.91
Cleaning or Etching Scrubber	Scrubber Liquor	cleaned or etched	1.33	38.66	23.20	1.34	19.33
Subpart F: Drawing with Emulsions or Soaps							
Core:							
Drawing with Emulsions or Soaps	Spent Emulsions	drawn	0.32	9.33	5.60	0.32	4.67
Degreasing	Spent Solvent						
Sawing	Spent Lubricant						
Ancillary Processes							
Continuous Rod Casting	Spent Lubricant	rod cast	0.0014	0.040	0.024	0.0014	0.020
Continuous Rod Casting	Contact Cooling Water	rod quenched	0.134	3.88	2.33	0.134	1.94
Solution Heat Treatment	Contact Cooling Water	rod quenched	1.34	40.74	24.44	1.41	20.37
Cleaning or Etching Bath	Bath Water	cleaned or etched	0.124	3.58	2.15	0.124	1.79
Cleaning or Etching Rinse	Rinse Water	cleaned or etched	0.96	27.82	16.69	0.96	13.91
Cleaning or Etching Scrubber	Scrubber Liquor	cleaned or etched	1.33	38.66	23.20	1.34	19.33

3.4.2 Alternative to TTO Monitoring

Section 467.03(b) of the Aluminum Forming regulation provides regulated IUs with an alternative to TTO monitoring. The regulated IUs may measure and limit oil and grease (O&G) to the limits specified in Table 3.3.

For BMRs and 90-day compliance reports, IUs must use the sampling schedules discussed in Section 2.1 and 2.3 of this manual. For the required semi-annual progress reports the Control Authority will establish the appropriate sampling schedules.

3.4.3 Sources of Toxic Organics

The sources of toxic organics in the Aluminum Forming category are similar to the sources described for Copper Forming: lubricants and emulsified oils and associated degreasing/cleaning agents contain the regulated toxic organic compounds. This section briefly describes the operations of each subcategory as an aid in determining where the toxic organics originate in the wastewater discharged to the POTW.

Subpart A: Rolling with Neat Oils

This rolling operation uses cast aluminum ingots to form a variety of end products. Neat oils such as mineral oils or kerosene-based lubricants are applied to the rollers to prevent wear and adhesion. Coolants are sprayed directly onto the metal and the rollers to maintain a uniform operating temperature. The coolants and lubricants are collected, filtered and recycled; spent material is continuously bled or periodically batch dumped to the wastestream.

Annealing furnaces can utilize wet scrubbers to control the atmospheric gases during the annealing process. The discharge of scrubber liquor results in a regulated wastestream. Wastestreams from degreasing and sawing operations containing spent solvents and lubricants are also considered in the core operations.

Ancillary operations that produce wastestreams are continuous sheet casting and solution heat treatment contact cooling water, and cleaning or etching liquids, including the scrubber liquor.

Subpart B: Rolling with Emulsions

The rolling with emulsions process is very similar to rolling with neat oils. In this subpart, the coolants and lubricants used are oil/water emulsions that range from 10-15 percent oil. This process also uses lubricants in sawing operations. Annealing furnaces are not utilized although other heat treatments may be employed.

Ancillary operations that produce contact cooling water wastestreams include solution heat treatment and direct chill casting. Cleaning or etching operations are also performed.

Subpart C: Extrusion

This process uses pressure exerted on a cast aluminum billet to form the desired product. The aluminum is generally heated, extruded, and then subjected to heat treatment. Lubricants are used on the ale and the ingot container walls to prevent adhesion. However, in cold extrusion the walls and billet surface are lubricated with a thin film of viscous or solid lubricant. Occasionally, liquid nitrogen will be used in place of an oil-based lubricant. Contact cooling water applied to the product after extrusion carries away some of the lubricant that has not been vaporized. Die cleaning also produces a wastestream through the dressing and repair of dies.

Ancillary operations producing contaminated wastestreams include: contact cooling waters from direct chill casting, press heat treatment, solution heat treatment and wastewater from cleaning, etching, and scrubber liquor.

Subpart D: Forging

Forging consists of applying compression to hot aluminum to form the desired shape. Colloidal graphite in water or oil is used as a lubricant for the dies. Although it is a dry process, smoke and particulate matter from partial combustion of the lubricants may require air pollution controls. If wet scrubbers are used to control the emissions they are considered part of an ancillary operation and their wastewater is regulated. Additionally, all solution heat treatment and cleaning or etching wastewaters are regulated.

Subpart E: Drawing with Neat Oils

Drawing is a process of pulling metal through a series of dies to reduce its diameter. Lubricants are used on the dies to assure uniform drawing temperatures and to reduce wear on the dies. As in Subparts A and B, the difference is in the lubricants and coolants used in the process. Oil based lubricants are generally used for heavy draws (higher reduction in diameter), oil in water emulsions and soap solutions are used for some of the lighter draws.

Annealing is required between draws. The metal is degreased prior to annealing so that the lubricant will not burn in the furnace. Solution heat treatment is also used, and is considered an ancillary operation along with continuous rod casting and cleaning or etching.

3.5 COIL COATING CATEGORY

3.5.1 TTO Limit

The only TTO pretreatment standard in the Coil Coating Category is in Subpart D - Canmaking Subcategory. Within the subcategory, only the manufacture of seamless can bodies which are washed is regulated. Since no wastewater is generated from the three other manufacturing processes included ir the subcategory, they are

exempted from all effluent limitations. These exempted processes include: (a) manufacture of seamed cans, (b) manufacture of seamless cans from coated stock, and (c) manufacture of can ends and tops. The limits promulgated for this category are production-based mass limits. The fourteen (14) toxic organics regulated under this category are:

1,1,1-trichloroethane	Pentachlorophenol
1,1-dichloroethane	Bis (2-ethylhexyl) phthalate
1,1,2,2-tetrachloroethane	Butyl benzylphthalate
Bis (2-chloroethyl) ether	Di-N-butyl phthalate
Chloroform	Phenanthrene
1,1-dichloroethylene	Tetrachloroethylene
Methylene chloride (dichloromethane)	Toluene

Compliance with the TTO limit is demonstrated by summing the mass of the individual toxic organic compounds present in the regulated wastestream in concentrations above 0.01 mg/l. This summation is then compared with the TTO standard to determine the IU's compliance status. Both a maximum daily limit and a maximum monthly average have been promulgated. Both limits must be met to achieve compliance. Table 3.4 presents the TTO limit for existing sources (PSES) and for new sources (PSNS). The compliance date for the PSES TTO limit is November 17, 1986. For the PSNS limit, it is when the new source commences its discharges.

The sampling schedule for the IU's BMR and 90-day compliance report is found in Sections 2.1 and 2.3, respectively in this manual. All 14 toxic organics must be analyzed for unless the oil and grease alternative discussed in the next section is adopted by the IU.

TABLE 3.4
COIL COATING - SUBCATEGORY D (CANMAKING)
TTO AND OIL AND GREASE STANDARDS

	Maximum Daily		Maximum Monthly Average[1]	
Pollutant	$g/10^6$ cans manf.	$lb/10^6$ cans manf.	$g/10^6$ cans manf.	$lb/10^6$ cans manf.
PSES TTO	26.85	0.059	12.59	0.028
PSES O&G	1678.00	3.699	1006.80	2.220
PSNS TTO	20.35	0.045	9.54	0.0210
PSNS O&G	1272.00	2.804	763.20	1.683

[1] Compliance is required regardless of the number of samples analyzed and averaged.

3.5.2 Alternative to TTO Monitoring

As an alternative to TTO, regulated IUs may elect to monitor for and comply with the O&G standards listed in Table 3.4 above. IUs subject these O&G standards, will not be subject to the TTO standards.

Again the BMR and 90-day compliance report sampling frequencies are discussed in Section 2.1 and 2.3, respectively, of this manual. Sampling frequencies for the semi-annual compliance reports shall be established by the Control Authority.

Specific to this regulation is the Oil and Grease analytical method promulgated on November 17, 1983 (40 CFR Section 465.03(c); 48 FR 52399). Corrections were promulgated on April 10, 1984 (49 FR 14104). The corrected method is presented in Appendix E. Any IU electing to use the O&G alternative must use this methodology in determining the amount of hydrocarbon oil and grease in each sample analyzed.

3.5.3 Sources of Toxic Organics

The 14 regulated toxic organics commonly occur as constituents in lubricants, solvents, and surface coatings. A recommended approach in identifying toxic organic sources is to compare the labels of these products to the list of regulated toxics above. Substitute compounds can often be found for these polyaromatic hydrocarbons and organic solvents, thus avoiding their use and introduction into the waste-stream. Introduction of toxic organics into the wastestream entering the POTW can occur from poor production/process management such as the dumping of spent solvents, sloppy use of lubricants and surface coatings, and release of highly contaminated rinse waters. Storage area spills entering through floor drains represent another possible source of toxic organic introdution into the POTW.

4. GUIDANCE FOR THE PREPARATION OF A TOXIC ORGANIC MANAGEMENT PLAN

As previously discussed, one alternative to routine TTO monitoring is the preparation of a toxic organic management plan (TOMP). This option is available to regulated industrial users in the Electroplating, Metal Finishing, and Electrical and Electronic Components (both Phase I and Phase II) categories.

A TOMP must specify the toxic organic compounds used, the method of disposal used (instead of discharge into wastestreams), and procedures for assuring that toxic organics do not routinely spill or leak into wastewater discharged to the POTW. Guidelines for preparation of a TOMP are presented below as four basic steps:

Step 1 - Process engineering analysis

A process engineering analysis should be conducted to determine the source and type of toxic organic compounds found in a facility's wastewater discharge, including sources and compounds that could reasonably be expected to enter the wastewater in the event of spills, leaks, etc., based on the type of operations conducted at a particular plant. Such an analysis should be based on the results of one or more analyses of the plant's wastewater for the toxic organic pollutants which are included in the definition of TTO for that industrial category and which can reasonably be expected to be present (see TTO monitoring guidance). The process engineering analysis should include:

a. An examination of published reports on the specific industry;

b. A water flow diagram to identify all possible wastewater sources;

c. A list of raw materials used in the industrial processes, including chemical additives, water treatment chemicals and cleaning agents, and the wastewater stream that each regulated toxic organic could potentially enter;

d. Comparison of the toxics found in the effluent with the list of raw materials and selection of the most probable wastewater source;

e. Evaluation of the toxics found in the effluent, but <u>not</u> on the raw materials list and determination of those formed as reaction products or by-products;

f. Examination of sources such as equipment corrosion or raw materials' impurities that could result in release to wastewaters of toxic organic pollutants.

Step 2 - Pollutant control evaluation

An evaluation should be made of the control options that could be implemented to eliminate the toxic compound(s) or the source or potential source of toxic organic compound introduction to the treatment system. This may include in-plant modifications, solvent or chemical substitution, partial or complete recycle, reuse, neutralization, and operational changes. The analysis should be conducted on a case-by-case basis and will often result in one or more feasible options to control each soure or potential source of toxic pollutant discharge. Finally, evaluation of the available control options, including the advantages and disadvantages of each, may lead to a decision of whether a TOMP is a feasible alternative to TTO monitoring.

Step 3 - Preparation of Toxic Organic Management Plan

A toxic organic management plan should include the following items at a minimum:

a. A complete inventory of all toxic organic chemicals in use or identified through sampling and analysis of the wastewater from regulated process operations (organic constituents of trade-name products should be obtained from the appropriate suppliers as necessary);

b. Descriptions of the methods of disposal other than dumping used for the inventoried compounds, such as reclamation, contract hauling, or incineration;

c. The procedures for ensuring that the regulated toxic organic pollutants do not spill or routinely leak into process wastewaters, floor drains, non-contact cooling water, groundwater, surface waters (i.e., Spill Prevention, Control, and Countermeasures (SPCC) Plan) or any other location which allows discharge of the compounds; and

d. Determinations or best estimates of the identities and approximate quantities of toxic organic pollutants used as well as discharged from the regulated manufacturing processes. Compounds present in wastestreams that are discharged to sanitary sewers may be a result of regulated processes or disposal, spills, leaks, rinse water carryover, air pollution control, and other sources.

Step 4 - Submission of Toxic Organic Management Plan and Certification Statement

The TOMP should be submitted to the Control Authority at the time the baseline monitoring report is required if the IU's initial election is to choose this option. Alternatively, an IU may submit a TOMP at any later time and request that TTO monitoring requirements be discontinued upon approval and implementation of the TOMP. A prerequisite for use of this certification approach is a fully approved, implemented, and ongoing toxic organic management plan. In addition, a certification statement must be included at the time of submission of the TOMP and with each subsequent IU report (i.e., semi-annual compliance report). It must be signed by an officer of the company or manager responsible for overall plant operations. A statement such as the following should be required.

> "Based on my inquiry of the person or persons directly responsible for managing compliance with the TTO limitations, I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last report. I further certify that this facility is implementing the toxic organic pollutant management plan submitted to the Control Authority on (date to be specified).

(date) (Officer)

If the user is unable to make the above certification statement, the user should notify the Control Authority sixty days (60) prior to the due date for filing the compliance reports. At that time, the Control Authority should determine the appropriateness of requiring sampling and analysis for specific toxicants and notify the user accordingly.

A sample Toxic Organic Management Plan and certification statement are included as Appendix D.

5. APPLICATION OF THE COMBINED WASTESTREAM FORMULA

One provision of the General Pretreatment Regulations that will often be necessary for POTWs and industries to use for proper monitoring and reporting on compliance with an applicable TTO limit is the Combined Wastestream Formula (CWF) [40 CFR 403.6(d)]. The CWF is a mechanism for calculating alternative limitations when regulated wastestreams are mixed with unregulated or dilution streams. The CWF is applied to the mixed effluent to account for the presence of the additional wastestream.

The following definitions and conditions are important for properly using the CWF.

5.1 DEFINITIONS

° Regulated Process Wastestream - an industrial process wastestream regulated by a national categorical pretreatment standard.

° Dilute Wastestream - Boiler blowdown, sanitary wastewater, noncontact cooling water, and certain process wastestreams that have been excluded from regulation in categorical pretreatment standards because they contain none of the regulated pollutant or only trace amounts of it.

° Unregulated Process Wastestream - any wastestream that is neither a regulated nor a dilute wastestream

Note: Definitions apply to individual pollutants. A wastestream from a process may be "regulated" for one pollutant and "unregulated" for another. Example cases are presented later in this section to illustrate these distinctions.

° Concentration-based Limit - a limit based on the relative strength of a pollutant in a wastestream, usually expressed in mg/l.

° Production-based Limit - a limitaiton based on the actual quantity of a pollutant in a wastestream per unit of production.

5.2 CWF CONDITIONS

To ensure proper application of the CWF, the following conditions must be met by a municipality and its regulated industries [40 CFR 403.6(d)]:

° Alternative discharge limits that are calculated in place of a categorical pretreatment standard must be enforceable as categorical standards.

- Calculation of alternative limits must be performed by the Control Authority.

- Alternative limits must be established for all regulated pollutants in each of the regulated processes.

- The Control Authority and/or the industrial user may use production-based limitations in place of the concentration-based limitations, when they are provided by a given categorical pretreatment standard such as electroplating or porcelain enameling.

- Both daily maximum and average (e.g., monthly) alternative limits must be calculated for each regulated pollutant, as required. [The TTO standard is generally only a daily maximum.]

- If process changes at an irdustry warrant, the Control Auhtority may recalculate the alternative limits at its discretion or at the request of the industrial user. The new alternative limits must be calculated and become effective within 30 days of the process change.

- The Control Authority may impose stricter alternative limits, but may not impose alternative limits which are less stringent than the calculated limits.

- A calculated alternative limit cannot be used if it is below the analytical detection limit for that pollutant. If a calculated limit is below the detection limit, the industrial user must either: 1) not combine the dilute streams prior to the sampling point, or 2) segregate all wastestreams entirely.

5.3 CALCULATION OF ALTERNATIVE TTO LIMITS USING THE CWF

The actual combined wastestream formula is presented in Table 5.1. When used for determining alternative TTO limits, the TTO limit for the applicable categorical standard (i) is presented in both the equations by C_i and M_i.

The individual organic compounds that make up the TTO value vary depending on the applicable categorical standard. For example, for Copper Forming industries, TTO refers to the sum of 12 individual organic compounds, whereas for Aluminum Forming industries, TTO refers to the sum of 39 individual organic compounds. (Only six organic compounds are common to both industrial categories). The CWF will only determine an alternative TTO value, independent of the individual organic compounds needed for each TTO limit. Therefore, if an industry has combined wastewater discharges from processes regulated by

TABLE 5.1

COMBINED WASTESTREAM FORMULAS

Alternative Concentration Limit Formula:

$$C_t = \left(\frac{\sum_{i=1}^{N} C_i F_i}{\sum_{i=1}^{N} F_i} \right) \times \left(\frac{F_t - F_d}{F_t} \right) \qquad \text{(Eq. 5-1)}$$

C_t - alternative concentration limit for the pollutant

C_i - Categorical Pretreatment Standard concentration limit for the pollutant in regulated stream i

F_i - average daily flow (at least 30 day average) of regulated stream i

F_d - average daily flow (at least 30 day average) of dilute wastestream(s)

F_t - average daily flow (at least 30 day average) through the combined treatment facility (including regulated, unregulated and dilute wastestreams)

N - total number of regulated streams

Alternate Mass Limit Formula

$$M_t = \left(\sum_{i=1}^{N} M_i \right) \times \left(\frac{F_t - F_d}{\sum_{i=1}^{N} F_i} \right) \qquad \text{(Eq. 5-2)}$$

M_t - alternative mass limit for the pollutant

M_i - Categorical Pretreatment Standard mass limit for the pollutant in regulated stream i

F_i - average daily flow (at least 30 day average) of regulated stream i

F_d - average daily flow (at least 30 day average) of dilute wastestream(s)

F_t - average daily flow (at least 30 day average) through the combined treatment facility (including regulated, unregulated and dilute wastestreams)

N - total number of regulated streams.

different categorical standards with specific TTO limits, the alternative TTO limit calculated using the CWF would refer to the sum of the individual toxic organic compounds that make up the TTO limit in each of the categorical standards. Thus, in the example given above, the alternative TTO limitation calculated by using the CWF would be monitored by analyzing for all 45 toxic organic compounds regulated by one or both of the categorical standards (Copper Forming and Aluminum Forming) and summing the concentrations greater than 0.01 mg/l.

5.3.1 Example Calculation for Alternative TTO Limits Using the CWF

Following are three examples of how the CWF is used to calculate alternative TTO limits. The examples assume mixing prior to treatment of the following process wastestreams at an industrial facility:

Industrial Category	Wastestream Type	Flow (mgd)	Daily Max. TTO Limit	Compliance Date
Metal Finishing (Etching)[1]	Regulated	0.1	4.57 mg/l 2.13 mg/l	June 30, 1984 Feb. 15, 1986
Aluminum Forming (Forging: Etching Bath)[2]	Regulated	0.075	0.123 mg/l off-kg[3]	Oct. 24, 1986
Sanitary Waste	Dilution	0.05	N/A	N/A

[1] This is not a subcategory but a metal finishing process.

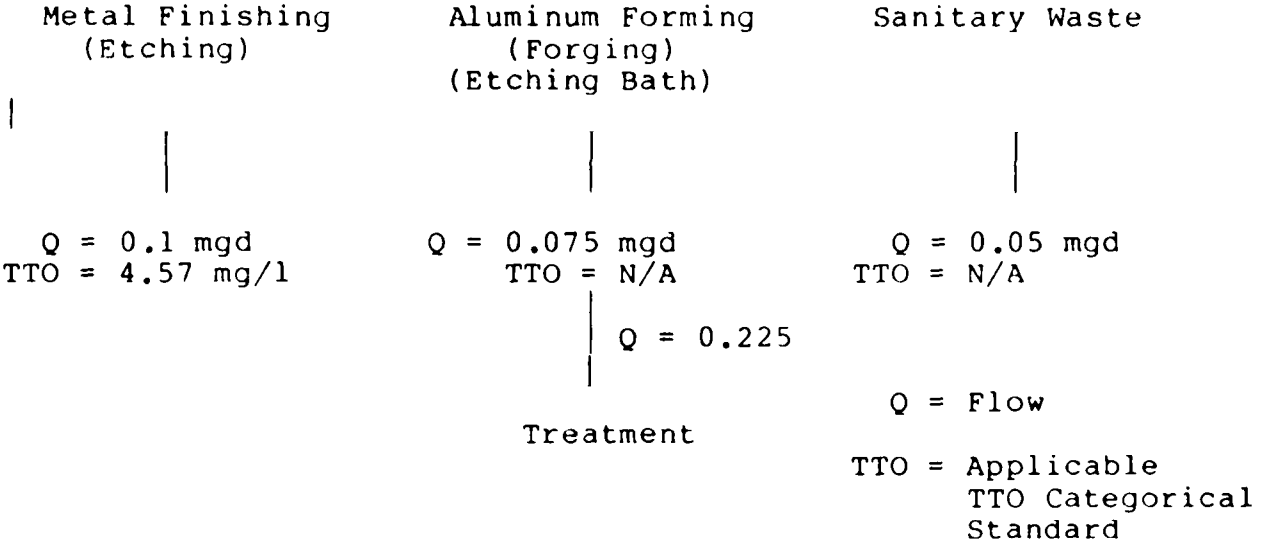
[2] Aliminum Forming, Subpart D - Forging, Subcategory - Cleaning or Etching Bath.

[3] Off-kg means the mass of aluminum removed from a forging or ancillary operation at the end of a process cycle for transfer to a different machine or process.

Examples 1 and 2 are applicable in all cases because they reflect the situation prior to the Aluminum Forming final compliance date. Example 3 is applicable after the Aluminum Forming final compliance date when the IU does not use the Aluminum Forming oil and grease alternative.

Example 4 is applicable after the Aluminum Forming compliance date when the IU does use the Aluminum Forming and the Metal Finishing TTO alternative. In this example, the CWF must be used to calculate both an alternative TTO and an alternative oil and grease limit.

Example 1: Calculation of alternative TTO discharge limit for an integrated industrial facility from June 30, 1984 (compliance date for Metal Finishing, interim TTO limit) until February 15, 1986 (compliance date for Metal Finishing, final TTO limit).



A concentration limitation is being calculated. Therefore, Equation 5-1, Table 5-1 is used.

The flow from the Metal Finishing process is considered a regulated wastestream since it is subject to a TTO pretreatment standard. The flow from the Aluminum Forming operation is also subject to a TTO pretreatment standard. The Aluminum Forming flow, however, is at present considered an unregulated wastestream, since the compliance date for Aluminum Forming Standards (October 24, 1986) has not yet arrived. The sanitary waste is considered a dilute wastestream. The alternate TTO limitation is, then, calculated as follows:

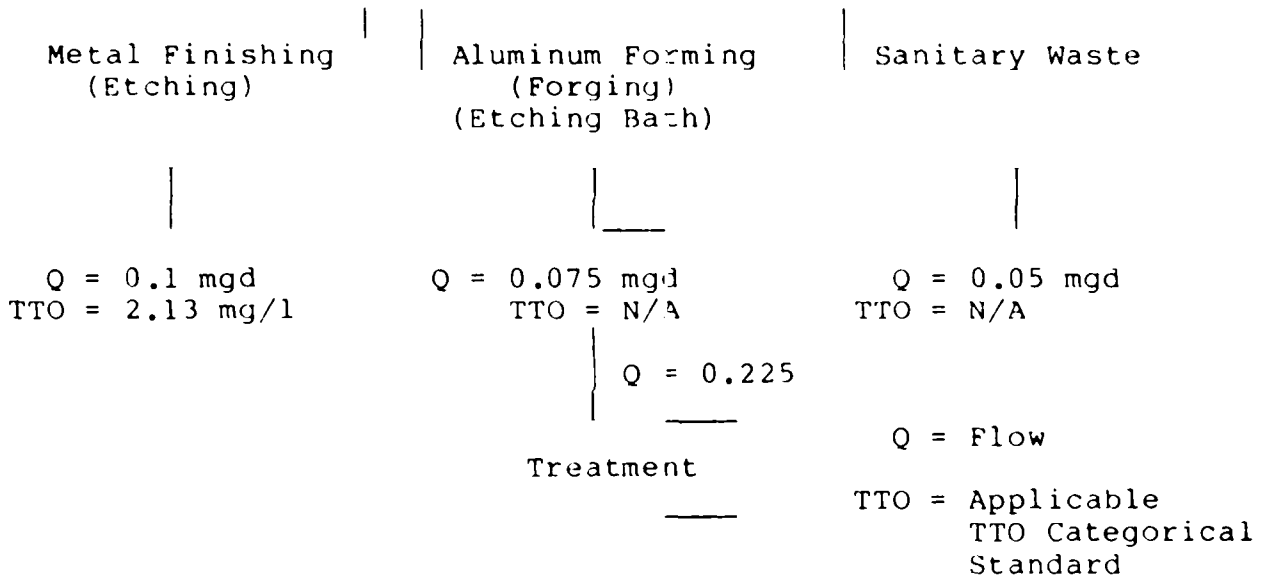
$$TTO_{cwf} = \frac{(4.57 \text{ mg/l} \times 0.1 \text{ mgd})}{0.1 \text{ mgd}} \times \frac{(0.1 \text{ mgd} + 0.075 \text{ mgd} + 0.05 \text{ mgd} - 0.05 \text{ mgd})}{0.225 \text{ mgd}}$$

$$TTO_{cwf} = 3.55 \text{ mg/l}$$

Rather than monitor TTO to determine compliance with this alternative limit, the owner/operator may elect with the Control Authority's approval to exercise the available alternative under the Metal Finishing regulation, the certification procedure incorporating a toxic organic management plan. For an integrated facility subject to a TTO standard with this alternative, and

electing to use the alternative, the required solvent management plan should focus on the entire facility, not just on the regulated metal finishing operation(s). However, the Control Authority must still use the CWF to develop the alternative limit for its necessary monitoring activity. When the Control Authority conducts sampling and analysis to verify continued compliance, it will compare its sampling results with the applicable alternative TTO limit developed using the CWF as in Example 1.

Example 2: Calculation of alternative TTO discharge limit for an integrated industrial facility from February 15, 1986 (compliance date for Metal Finishing, final TTO limit) until October 24, 1986 (compliance date for Aluminum Forming).



The difference between this example and the previous one is that the metal finishing wastewater is now subject to a more stringent limitation. Since the compliance date for aluminum forming has still not arrived it is still considered unregulated.

$$TTO_{CWF} = (2.13 \text{ mg/l} \times 0.1 \text{ mgd}) \times \frac{0.1 \text{ mgd} + 0.075 \text{ mgd} + 0.05 \text{ mgd} - 0.05 \text{ mgd}}{0.1 \text{ mgd}} \quad \frac{}{0.225 \text{ mgd}}$$

$$TTO_{CWF} = 1.66 \text{ mg/l}$$

In this example, the use of the TTO alternative available under the Metal Finishing regulation follows the guidance discussed in Example 1.

Example 3: Calculation of alternative TTO discharge limit for an integrated industrial facility after October 24, 1986 (compliance date for Aluminum Forming) when the Aluminum Forming oil and grease alternative is not used.

Because the TTO limit for Aluminum Forming is expressed as a production-based limit, the first step necessary is the conversion of the production-based TTO limit to the equivalent concentration-based TTO limit. Based on the following production data for the industry:

Aluminum Forming (Forging: Etching Bath) Maximum Daily Limit for TTO = 0.12 mg/off-kg of aluminum forged

Average Daily Production During Previous 12 Months = 85,000 off-kg of aluminum forged per day

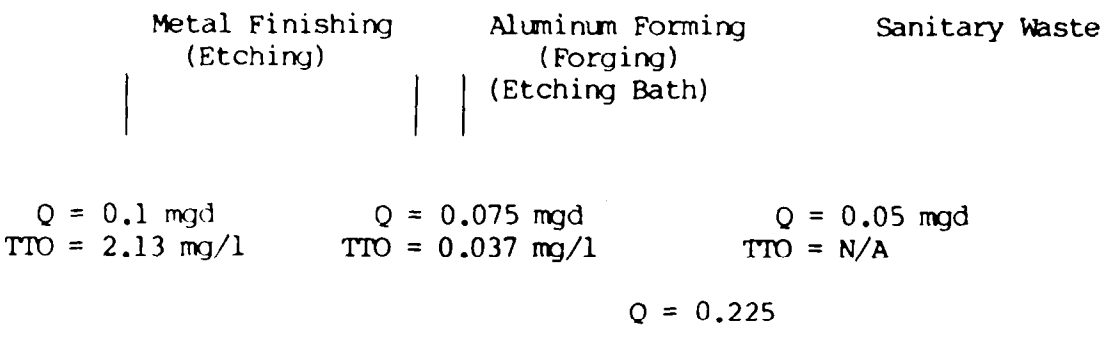
Average Daily Water Usage in Forging During Previous 12 Months = 75,000 gpd

The conversion of production-based TTO limit to a concentration-based TTO limit is as follows:

$$\text{TTO (concentration equivalent)} = \frac{\text{(Production-Based Limit)(Avg. Daily Production)}}{\text{(Avg. Daily Flow From Regulated Process)(Conversion Factor)}}$$

$$\text{TTO (concentration equivalent)} = \frac{(0.123 \text{ mg/off-kg})(85{,}000\text{-kg/day})}{75{,}000 \text{ gpd } (3.785 \text{ liters/gallon})} = 0.037 \text{ mg/l}$$

Once the equivalent concentration-based TTO limit is determined the alternate TTO limit can be calculated as follows (aluminum forming wastes are now a regulated wastestream):



$$TTO_{cwf} = (2.13 \text{ mg/l} \times 0.1 \text{ mgd}) + (0.037 \text{ mg/l} \times 0.075 \text{ mgd}) \over (0.1 \text{ mgd} + 0.075 \text{ mgd}) \quad X$$

$$(0.1 \text{ mgd} + 0.075 \text{ mgd} + 0.05 \text{ mgd} - 0.05 \text{ mgd}) \over 0.225 \text{ mgd}$$

$$TTO_{cwf} = 0.96 \text{ mg/l}$$

Note: The alternate TTO discharge limit is based on Metal Finishing and Aluminum Forming Categorical Standards and is proportioned by the flow of both the regulated wastestreams. Due to dilution from sanitary waste, the alternate discharge limit is reduced.

The TTO limit is the sum of the concentrations of the toxic organic compounds listed in the Metal Finishing and Aluminum Forming regulations, respectively, and found in the facility's discharge in concentrations greater than 0.01 mg/l. In this example, all Aluminum Forming TTO constituents and those Metal Finishing TTO constituents reasonably expected to be present must be analyzed for.

Example 4: Calculation of alternative TTO and oil and grease discharge limits for an integrated facility after October 24, 1986 (compliance date for Aluminun Forming) when the Aluminum Forming oil and grease alternative is used.

This example presents a somewhat more complicated situation when considering the alternatives to TTO monitoring. The Metal Finishing regulation provides the alternative certification procedure with a toxic organic management plan. The Aluminum Forming regulation provides alternative Oil and Grease (O&G) limitations. In this situation an industrial facility electing (with its Control Authority's approval) to exercise the TTO monitoring alternatives should proceed as follows. First, the owner/operator must make the necessary certification and develop and implement a toxic organic management plan (TOMP) as required by the Metal Finishing regulation. The TOMP should apply to all operations and facilities where toxic organics may enter the sewer.

Then, the CWF must be used to develop the alternative TTO limit. Example 2 should be used in this calculation because the Aluminum Forming wastestream is considered "unregulated" for TTO because the IU is using the Aluminum Forming oil and grease alternative.

Second, the owner/operator using the CWF must develop an alternative O&G limitation for his facility. With the Control Authority's approval, the owner/operator can use either the stated production-based O & G limitation for developing the alternative limit or convert the given production-based limit to the equivalent concentration-based O & G limit and then calculate the alternative limit using the CWF.

Calculation of the alternative O & G production-based limitation for an integrated facility after October 24, 1986 (compliance date for Aluminum Forming) is as follows. In this situation the metal finishing wastestream is an unregulated wastestream because it is not regulated for O & G.

Metal Finishing (Etching)	Aluminum Forming (Forging) (Etching Bath)	Sanitary Waste
Q = 0.1 mgd TTO = 2.13 mg/l	Q = 0.075 mgd O&G = 3.58 mg/off-kg	Q = 0.05 mgd TTO = N/A

Q = 0.225 mgd

Treatment

$$O \& G = (3.58 \text{ mg/off-kg}) \times \frac{(0.1 \text{ mgd} + 0.075 \text{ mgd} + 0.05 \text{ mgd} - 0.05 \text{ mgd})}{0.225 \text{ mgd}}$$

O & G = 2.78 mg/off-kg

When the Control Authority allows conversion to a concentration-based alternative O & G standard, the calculation of the alternative O & G concentration-based limitation after October 24, 1986 is as follows. Again, the metal finishing wastestream is an unregulated wastestream.

Because the O & G limit is a production-based limit the first step is to convert this limit to its equivalent concentration-based limit.

The following is hypothetical production data for the industry:

Aluminum Forming (Forging & Etching Bath Maximum Daily O & G Limit	= 3.58 mg/off-kg of Al forged
Average Daily Production During Previous Twelve Months	= 85,000 off-kg of Al forged per day
Average Daily Water Use in Forging During Previous Welve Months	= 75,000 gpd

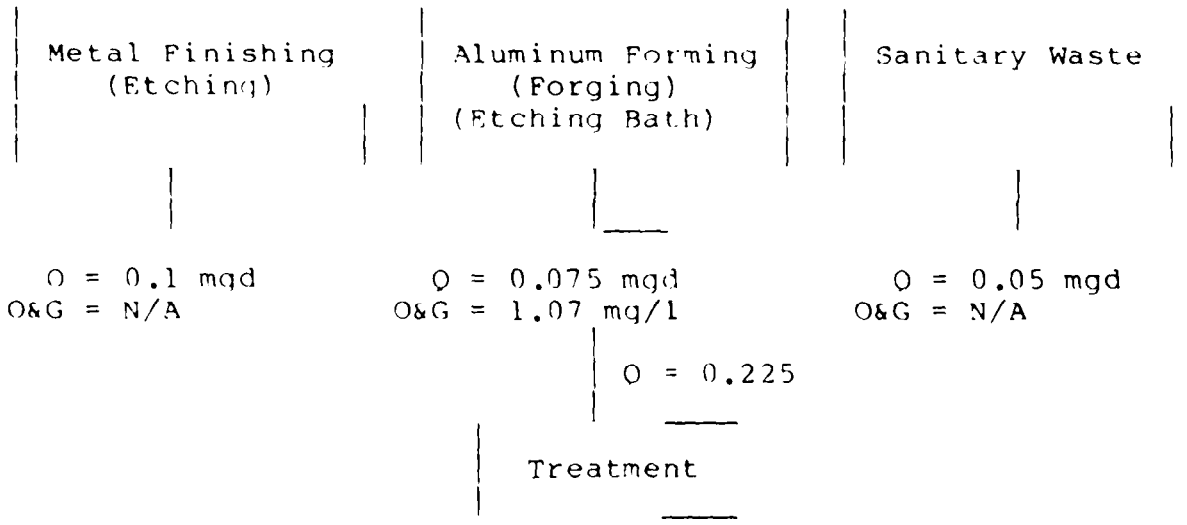
The conversion of the production-based O & G limit to an equivalent concentration-based O & G limit is as follows:

$$\text{O \& G (concentration equivalent)} = \frac{\text{(Production-Based Limit)(Avg. Daily Production)}}{\text{(Avg. Daily Flow From Reg. Process)(Conversion Factor)}}$$

$$= \frac{\text{(3.58 mg/off-kg)(85,000 off-kg/day)}}{\text{(75,000 gpd) (3.785 liters/gallon)}}$$

$$= 1.07 \text{ mg/liter}$$

Now, the alternative O & G limit can be calculated as follows:



$$O\&G_{cwf} \neq \frac{(1.07 \text{ mg/liter} \times 0.075 \text{ mgd})}{0.075 \text{ mgd}} \times \frac{(0.1 \text{ mgd} + 0.075 \text{ mgd} + 0.05 \text{ mgc} - 0.05 \text{ mgd})}{0.225 \text{ mgd}}$$

$$O\&G_{cwf} = 0.83 \text{ mg/l}$$

6. REMOVAL CREDITS

Another provision of the General Pretreatment Regulations that POTWs and industrial users will sometimes use is the Removal Credit Provision. EPA promulgated on August 3, 1984 a revised §403.7, Removal Credits [49 FR 31212]. This provision allows POTWs to provide their categorical industrial users with a credit (in the form of adjusted categorical pretreatment standards) for removal of pollutants by the POTWs' treatment systems. Industrial users of such a POTW may be allowed by their POTWs to discharge greater quantities of regulated pollutants than otherwise permitted by applicable categorical standards. POTWs have complete discretion in deciding whether to grant removal credits to the industrial users after it has obtained the authority to grant such credits from its Approval Authority.

6.1 REMOVAL CREDITS FOR TTO

The Electroplating, Metal Finishing, and Electrical Electronic Components (Phase I and Phase II), Copper Forming, Aluminum Forming and Coil Coating categorical pretreatment standards regulate TTO discharges to POTWs. POTWs under §403.7 of the General Pretreatment Regulation can grant removal credits to IUs regulated under any of these standards. Before granting a removal credit to an IU, a POTW must first obtain the authority to do so from its Approval Authority. More complete information on the procedures which POTWs must use to obtain Removal Credit authority can be found in the Guidance Manual for Preparation and Review of Removal Credit Applications (September, 1985).

POTWs should carefully consider any decision to seek removal credit authority for TTO. In assessing the appropriateness of a TTO removal credit the following should be considered:

- The specific organic compounds included as a TTO component in each regulation vary from regulation to regulation.
- Toxic organic removal by the POTW may be for a different mixture of TTO constituents than those discharged by an industrial user.
- Easing of TTO limits in Electroplating, Metal Finishing, and Electrical and Electronic Components contradicts the policy promoting best management practices by the IU and negates the inherent benefits of such practices.
- For the Aluminum Forming, Coil Coating and Copper Forming regulations the Agency has provided an alternative oil and grease standard for easier implementation.

- Most TTO constituents are stripped, not treated, by conventional POTW treatment (which may be hazardous to POTW workers and the environment).

Based on the previous factors, the Agency does not encourage applications for TTO removal credits.

6.2 REMOVAL CREDITS FOR TTO SURROGATE OR INDICATOR POLLUTANTS

Section 403.7(a)(2) of the General Pretreatment Regulations states that removal credits may only be given for indicator or surrogate pollutants regulated in a categorical pretreatment standard when the categorical pretreatment standard specifically so authorizes.

The Copper Forming, Aluminum Forming and the Coil Coating pretreatment standards regulate oil and grease as a surrogate or indicator pollutant for TTO monitoring. However, none of these regulations specifically authorizes removal credits for oil and grease. Therefore, POTWs shall not grant any oil and grease removal credit to IUs regulated under these regulations.

7. TTO MONITORING GUIDANCE

7.1 SAMPLING CONSIDERATIONS

The representativeness and validity of industrial user (IU) discharge data is important to ensure compliance with categorical pretreatment standards. Monitoring to assess compliance with TTO discharge standards may involve monitoring simultaneously for several different organic pollutant parameters. Therefore, the validity of TTO discharge data, collected by either the Control Authority performing industrial compliance monitoring or an IU performing self-monitoring, is contingent upon utilization of the proper sampling and analytical procedures. This section will present guidelines and considerations for sampling and analysis of IU discharges to help ensure that a representative and uncontaminated TTO sample is collected and properly analyzed.

Much of the following guidance was obtained from documents that address sample collection and preservation and flow measurement. Since this section presents only limited specific guidelines and considerations for TTO monitoring, it is recommended that these references be utilized by the IU and Control Authority to ensure proper sample collection techniques. They include, among others:

- Guidelines Establishing Procedures for the Analysis of Pollutants; Final Rule (40 CFR Part 136) October 26, 1984
- Handbook for Samplng and Sample Preservation of Water and Wastewater, U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, September 1982. Report No. EPA-600/4-82-029. NTIS PB83-124503.
- Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, 1983. Report No. EPA-600/4-79-020. NTIS PB 297686.
- Compliance Evaluation Inspection Manual, EPA, Office of Water Enforcement, July 1976.
- NPDES Compliance Sampling Inspection Manual-MCD-51, USEPA Enforcement Division, Office of Water Enforcement, Compliance Branch.

7.1.1 Sampling Location

The location of sampling points within an industry's pretreatment system or conveyance lines cannot always be specified by general rule as conditions (i.e., processes, rate of production) vary with each industry. Therefore, exact sampling locations must be identified on a case-by-case basis. However, certain general principles can be suggested for both IU self-monitoring and Control Authority monitoring as follows:

- A permanent sampling location(s) should be identified for use by both the Control Authority and industry. This is typically accomplished during a Control Authority inspection of the IU so that both parties agree on and are familiar with the location(s).

- The sampling location should be easily accessible and relatively free of safety hazards (i.e., confined space)

- For categorical industries, there should, if possible, be no discharge present other than from the regulated process. If other wastestreams (regulated, unregulated, or dilution) are combined with the regulated wastestream prior to the sampling location, the combined wastestream formula (40 CFR 403.6(e)) will need to be utilized. Chapter 5 of this manual provides specific guidance for using the combined wastestream formula.

- If the rate of industrial process discharge flow is needed (i.e., where mass limitations are applied), the sampling location will need to be located where the flow of the wastestream is known or can be measured or estimated.

- Repetitive samples (both for IU self-monitoring and Control Authority compliance monitoring) should always be obtained from the same sampling location.

7.1.2 Sample Collection Techniques

Generally, there are two types of samples (grab and composite samples) that can be collected either manually or with automatic sampling equipment. Grab samples are individual samples collected over a period not exceeding 15 minutes; the grab sample is usually collected manually. The collection of a grab sample is appropriate when a sample is needed to:

- Provide information about instantaneous concentrations of a pollutant at specific times

- Allow collection of a variable sample volume

- Gather information more quickly than composite sampling allows

- Collect samples for parameters not amenable to automatic sampling (e.g., oil and grease, volatile organics, coliform bacteria).

Composite samples consist of: (1) grab samples collected at equal intervals and combined proportional to wastestream flow, (2) samples collected continuously and proportional to wastestream flow, or (3) equal volumes taken at varying time intervals. Composite samples are used when:

- Determining average pollutant concentration during the compositing period

- Calculating mass/unit time loadings
- Wastewater characteristics are significantly variable.

Particular regulated organic pollutants, each of which account for part of the applicable TTO value for an IU, have particular techniques that need to be followed during sample collection. For example, a sample for acrolein must be a discrete grab, whereas a sample for 1,3-dichlorobenzene may be a grab or composite sample. Table 7.1 presents the sampling techniques for all the organic parameters that may be included in an TTO value. For those parameters that can only be collected by a grab sample (Purgeable Halocarbons, Purgeable Aromatics, Acrolein and Acrylonitrile), a special sampling technique is used due to their volatile nature. A 40-milliliter glass sample bottle (or vial) should be filled in such a manner that no air bubbles pass through the sample as the bottle is being filled. The bottles then should be sealed so that no air bubbles are entrapped in it. This hermetic seal must be maintained until the time of sample analysis. It is often difficult to fill the 40 milliliter bottle directly from the wastestream, in which case a larger glass bottle may be used to collect (grab) the sample from the wastestream and transfer the sample to the smaller sample container.

It is also important to note that Purgeable Halocarbons, Purgeable Aromatics, Acrolein and Acrylonitrile samples can only be taken as discrete grab samples, and cannot be composited in the field. Compositing of purgeable parameter samples must be performed in the laboratory.

7.1.3 Sample Volumes

The volume of samples collected depends on the type and number of analyses that are needed, as reflected in the parameters to be measured. The volume of the sample obtained should be sufficient to perform all the required analyses plus additional amounts to provide for any split samples or repeat analyses.

Table 7.2 presents the sample volumes required for all the organic priority pollutants that may be analyzed as part of the TTO value. Note that required volumes are given for analysis of each class of organic compound (which include specific organic pollutants) even if only a specific pollutant analysis is needed. The volumes listed also include the two procedures that analyze for all the purgeable organic parameters and for all the remaining organic pollutant parameters (Acids, Base/Neutrals, Pesticides).

It is important that the IU or Control Authority consult the laboratory performing the analysis to determine if any additional sample volume will be needed.

TABLE 7.1

SAMPLE COLLECTION TECHNIQUES FOR ORGANIC PRIORITY POLLUTANT

Parameter	Collection Technique: Grab	Collection Technique: Composite
Purgeable Halocarbons (Includes: Bromoform, Bromodichloromethane, Bromomethane, Carbon tetrachloride, Chlorobenzene, Chloroethane, 2-Chloroethylvinyl ether, Chloroform, Chloromethane, Dibromochloromethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichlhloroethene, trans-1,2-Dichloroethene, 1,2-Dichloropropane, cis-1,3-Dichloropropene, trans-1,2-Dichloroporpene, Methylene chloride, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane, Vinyl chloride)	X	
Purgeable Aromatics (Includes: Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Ethylbenzene, Toluene)	X	
Acrolein and Acrylonitrile	X	

TABLE 7.1

SAMPLE COLLECTION TECHNIQUES FOR ORGANIC PRIORITY POLLUTANT (Continued)

Parameter	Collection Technique Grab	Composite
Phenols (Includes: 4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol 2,4-Dimethylphenol 2-Methyl-4,6-dinitrophenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,6-Trichlorophenol)	X	X
Benzidines (Includes: Benzidene 3,3-Dichlorobenzidene)	X	X
Phthalate Esters (Includes: Benzyl butyl phthalate Bis(2-ethylexyl) phthalate Di-n-butyl phthalate Di-n-octyl phthalate Diethyl phthalate Dimethyl phthalate)	X	X
Nitrosamines (Includes: N-nitrosodimethylamine N-nitrosodiphenylamine N-nitrosodi-n-propylamine)	X	X

TABLE 7.1

SAMPLE COLLECTION TECHNIQUES FOR ORGANIC PRIORITY POLLUTANT (Continued)

Parameter	Collection Technique Grab	Composite
Organochlorine Pesticides and PCB's	X	X
(Includes: Aldrin		
a-BHC		
b-BHC		
d-BHC		
g-BHC		
Chlordane		
4,4-DDD		
4,4-DDE		
4,4-DDT		
Dieldrin		
Endosultan I		
Endosultan II		
Endosultan Sulfate		
Endrin		
Endrin Aldehyde		
Heptachlor		
Heptachlor Epoxide		
Toxaphene		
PCB-1016		
PCB-1221		
PCB-1232		
PCB-1242		
PCB-1248		
PCB-1254		
PCB-1260)		
Nitroaromatics and Isophorone	X	X
(Includes: Isophorone		
Nitrobenzene		
2,4-Dinitrotoluene		
2,6-Dinitrotoluene)		

TABLE 7.1

SAMPLE COLLECTION TECHNIQUES FOR ORGANIC PRIORITY POLLUTANT (Continued)

Parameter	Collection Technique Grab	Composite
Polynuclear Aromatic Hydrocarbons (Includes: Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(b)pyrene, Benzo(b)thuoranthene, Benzo(g)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene)	X	X
Haloethers (Includes: Bis(2-chloroethyl) ether, Bis(2-chloroethoxy) methane, Bis(2-chloroisopropyl) ether, 4-Bromophenyl phenyl ether, 4-Chlorophenyl phenyl ether)	X	X
Chlorinated Hydrocarbons (Includes: Hexachlorocyclopentadiene, Hexachlorobenzine, Hexachlorobutadiene, Hexachloroethane, 1,2-Dichlorobenzene, 1,2,4-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-chloronaphthalene)	X	X
2,3,7,8-Tetrachlorodibenzeno-p-dioxin	X	X
Purgeables	X	
Base/Neutral, Acids and Pesticides	X	X

Source: 40 CFR Part 136

TABLE 7.2

SAMPLE VOLUMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS*

Parameter	Required Minimum Sample Volume (ml)
Purgeable Halocarbons (Includes: Bromoform Bromodichloromethane Bromomethane Carbon tetrachloride Chlorobenzene Chloroethane 2-Chloroethylvinyl ether Chloroform Chloromethane Dibromochloromethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Dichlorodifluoromethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichlhloroethene trans-1,2-Dichloroethene 1,2-Dichloropropane cis-1,3-Dichloropropene trans-1,2-Dichloroporpene Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethene 1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene Trichlorofluoromethane Vinyl chloride)	40
Purgeable Aromatics (Includes: Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene)	40
Acrolein and Acrylonitrile	40

TABLE 7.2

SAMPLE VOLUMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS* (Continued)

Parameter		Required Minimum Sample Volume (ml)
Phenols		1,000
(Includes:	4-Chloro-3-methylphenol	
	2-Chlorophenol	
	2,4-Dichlorophenol	
	2,4-Dimethylphenol	
	2-Methyl-4,6-dinitrophenol	
	2-Nitrophenol	
	4-Nitrophenol	
	Pentachlorophenol	
	Phenol	
	2,4,6-Trichlorophenol)	
Benzidines		1,000
(Includes:	Benzidene	
	3,3-Dichlorobenzidene)	
Phthalate Esters		1,000
(Includes:	Benzyl butyl phthalate	
	Bis(2-ethylexyl) phthalate	
	Di-n-butyl phthalate	
	Di-n-octyl phthalate	
	Diethyl phthalate	
	Dimethyl phthalate)	
Nitrosamines		1,000
(Includes:	N-nitrosodimethylamine	
	N-nitrosodiphenylamine	
	N-nitrosodi-n-propylamine)	

TABLE 7.2

SAMPLE VOLUMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS* (Continued)

Parameter	Required Minimum Sample Volume (ml)
Organochlorine Pesticides and PCB's (Includes: Aldrin, a-BHC, b-BHC, d-BHC, g-BHC, Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, Endosultan I, Endosultan II, Endosultan Sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, Toxaphene, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260)	1,000
Nitroaromatics and Isophorone (Includes: Isophorone, Nitrobenzene, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene)	1,000

TABLE 7.2

SAMPLE VOLUMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS* (Continued)

Parameter	Required Minimum Sample Volume (ml)
Polynuclear Aromatic Hydrocarbons (Includes: Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(b)pyrene, Benzo(b)thuoranthene, Benzo(g)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene)	1,000
Haloethers (Includes: Bis(2-chloroethyl) ether, Bis(2-chloroethoxy) methane, Bis(2-chloroisopropyl) ether, 4-Bromophenyl phenyl ether, 4-Chlorophenyl phenyl ether)	1,000
Chlorinated Hydrocarbons (Includes: Hexachlorocyclopentadiene, Hexachlorobenzine, Hexachlorobutadiene, Hexachloroethane, 1,2-Dichlorobenzene, 1,2,4-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-chloronaphthalene)	1,000
2,3,7,8-Tetrachlorodibenzeno-p-dioxin	1,000
Purgeables	40
Base/Neutral, Acids and Pesticides	1,000-2,000

Source: 40 CFR Part 136

7.1.4 Sample Equipment and Containers

The equipment that can be used for sampling industrial process wastestreams ranges from a simple bucket to highly complex automatic samplers. The type of equipment that will be used by an IU and the Control Authority depends upon not only the pollutant parameter to be sampled, but also the sample location, sample frequency, sample volume, etc.

When sampling activities are relatively complex, such as flow proportional composite sampling over extended time periods, automatic samplers may be much more efficient. Many automatic samplers can directly correlate process wastestream flow with both sample volume and time. In hazardous sampling situations, which may occur when sampling wastestreams containing organic priority pollutants, use of automatic samplers can reduce the risk of injury to sampling personnel. The disadvantages of automatic samplers are high capital costs and maintenance requirements. However an IU or Control Authority can frequently offset these disadvantages through reduced labor requirements and a good equipment maintenance program.

There are a number of commerically manufactured automatic samplers available for use by an IU or Control Authority. EPA has outlined criteria for selecting automatic samplers in their NPDES Compliance Sampling Inspection Manual. Examples of some of the criteria include weight of sampler, minimum sample, lift velocity, purge cycle, etc. When sampling for organic priority pollutants to determine a TTO value, certain criteria for use of automatic samplers must be followed to ensure the collection of an uncontaminated sample. At a minium, these criteria include:

- The automatic sample collection equipment must be free of tygon and other potential sources of contamination
- The automatic sampler must be able to keep the samples refrigerated at all times
- The automatic sampler must be able to accommodate glass collection containers.

The selection and preparation of sample containers is based on the parameters to be measured. All organic priority pollutant samples (whether grab or composite) must be collected and stored using glass containers. Therefore, if manual grab samples will be composited, both the grab collection container and composite container must be made of glass. Before containers are transported to the laboratory, caps with a teflon lining (or foil for non-purgeable parameters if the sample is not corrosive) must be used to seal the sample container.

7.1.5 Sample Preservation and Holding Times

In most cases, industrial wastewater samples contain one or more unstable pollutants that require immediate analysis or preservation. Prompt analysis is the most positive assurance against error from sample deterioration, but this is not feasible for composite samples, in which portions may be stored for as long as 24 hours. For some pollutants, deterioration can be sufficiently deferred by preservation of the samples during compositing and transfer to the laboratory. Procedures used to preserve samples include refrigeration, pH adjustment, and chemical treatment. Prior preservation and holding time for organic pollutant samples is essential to the integrity of any monitoring program. Table 7.3 provides the recommended preservatives and maximum holding times that should be used for the specific classes of organic pollutants.

The procedures outlined in Table 7.3 should be used at the start of sample collection in the field. However, aliquots of a composite sample that would require multiple preservatives, can be preserved only by maintaining the sample aliquots at 4°C until compositing and sample splitting are completed.

7.1.6 Sample Type and Frequency for TTO Monitoring

The type of sample and frequency of sampling necessary for reporting TTO compliance data depends upon: (1) IU self-monitoring requirements, and (2) Control Authority compliance monitoring procedures.

The sample type prescribed for any of the above reports consists of a composite sample collected at intervals that would properly represent the process wastestream flows from typical daily operations at an IU. Where feasible, composite samples should be flow-proportioned. Depending on the types of organic pollutant parameters sampled for TTO and the wide variety of processes existing at different IUs, the IU may be allowed by the Control Authority to collect and report the results of a grab sample.

Industrial self-monitoring requirements for each categorical standard have not been promulgated to date. However, Section 403.12 of the General Pretreatment Regulations requires the submission of self-monitoring reports to the Control Authority which must contain industrial process wastestream discharge data for the pollutant parameters regulated by the applicable categorical standard. These reports were discussed in Chapter 2 of this document.

The frequency with which the above composite samples should be taken to comply with all industrial self-monitoring requirements depends on the discharge flow of each IU. The minimum number of consecutive sampling days for the reporting period is three in a two-week period for facilities discharging less than 250,000 GPD, and six in a two-week period for facilities discharging more than 250,000 GPD. Sampling must occur during peak operational periods.

TABLE 7.3

SAMPLE PRESERVATION AND HOLDING TIMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS

Parameter	EPA Method No.	Preservative	Maximum Holding Time
Purgeable Halocarbons (Includes: Bromoform, Bromodichloromethane, Bromomethane, Carbon tetrachloride, Chlorobenzene, Chloroethane, 2-Chloroethylvinyl ether, Chloroform, Chloromethane, Dibromochloromethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichlhloroethene, trans-1,2-Dichloroethene, 1,2-Dichloropropane, cis-1,3-Dichloropropene, trans-1,2-Dichloroporpene, Methylene chloride, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane, Vinyl chloride)	601	Cool, 4°C [1] 0.008% $Na_2S_2O_3$	14 days

TABLE 7.3 (Continued)

SAMPLE PRESERVATION AND HOLDING TIMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS (Continued)

Parameter	EPA Method No.	Preservative	Maximum Holding Time
Purgeable Aromatics (Includes: Benzene Chlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene Ethylbenzene Toluene)	602	Cool, 4°C 0.008% $Na_2S_2O_3$ [1] 1:1 HCl to pH <2	14 Days
Acrolein and Acrylonitrile	603	Cool, 4°C 0.008% $Na_2S_2O_3$ [1] Adjust pH to 4-5	14 Days (3 days for acrolein if pH not adjusted)
Phenols (Includes: 4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol 2,4-Dimethylphenol 2-Methyl-4,6-dinitrophenol 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,4,6-Trichlorophenol)	604	Cool, 4°C [2] 0.008% $N_aS_2O_3$ [1]	7 days until extraction, 40 days after extraction
Benzidines (Includes: Benzidene 3,3-Dichlorobenzidene)	605	Cool, 4°C 0.008% $Na_2S_2O_3$ [1]	7 days until extraction, 40 days after extraction

TABLE 7.3 (Continued)

SAMPLE PRESERVATION AND HOLDING TIMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS (Continued)

Parameter	EPA Method No.	Preservative	Maximum Holding Time
Phthalate Esters (Includes: Benzyl butyl phthalate Bis(2-ethylexyl) phthalate Di-n-butyl phthalate Di-n-octyl phthalate Diethyl phthalate Dimethyl phthalate)	606	Cool, 4°C	7 days until extraction, 40 days after extraction
Nitrosamines (Includes: N-nitrosodimethylamine N-nitrosodiphenylamine N-nitrosodi-n-propylamine)	607	Cool, 4°C Store in dark,[1] 0.008% $Na_2S_2O_3$ 1:1 NaOH to pH 7-10[2]	7 days until extraction, 40 days after extraction

TABLE 7.3 (Continued)

SAMPLE PRESERVATION AND HOLDING TIMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS (Continued)

Parameter	EPA Method No.	Preservative	Maximum Holding Time
Organochlorine Pesticides and PCB's (Includes: Aldrin, a-BHC, b-BHC, d-BHC, g-BHC, Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, Endosultan I, Endosultan II, Endosultan Sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, Toxaphene, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, PCB-1260)	608	Cool, 4°C Adjust pH to 5-9[1,3] 0.008% $Na_2S_2O_3$[1,3]	7 days until extraction,[1] 40 days after extraction

TABLE 7.3 (Continued)

SAMPLE PRESERVATION AND HOLDING TIMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS (Continued)

Parameter	EPA Method No.	Preservative	Maximum Holding Time
Nitroaromatics and Isophorone (Includes: Isophorone Nitrobenzene 2,4-Dinitrotoluene 2,6-Dinitrotoluene)	609	Cool, 4°C	7 days until extraction, 40 days after extraction
Polynuclear Aromatic Hydrocarbons (Includes: Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(b)pyrene Benzo(b)fluoranthene Benzo(g)perylene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene)	610	Cool, 4°C Store in dark,[1] 0.008% $Na_2S_2O_3$	7 days until extraction, 40 days after extraction
Haloethers (Includes: Bis(2-chloroethyl) ether Bis(2-chloroethoxy) methane Bis(2-chloroisopropyl) ether 4-Bromophenyl phenyl ether 4-Chlorophenyl phenyl ether)	611	Cool, 4°C 0.008% $Na_2S_2O_3$[1]	7 days until extraction, 40 days after extraction

TABLE 7.3 (Continued)

SAMPLE PRESERVATION AND HOLDING TIMES FOR ORGANIC PRIORITY POLLUTANT ANALYSIS (Continued)

Parameter	EPA Method No.	Preservative	Maximum Holding Time
Chlorinated Hydrocarbons (Includes: Hexachlorocyclopentadiene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane 1,2-Dichlorobenzene 1,2,4-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2-chloronaphthalene)	612	Cool, 4°C	days until extraction, days after extraction
2,3,7,8-Tetrachlorodibenzeno-p-dioxin	613	Cool, 4°C 0.008% $Na_2S_2O_3$ [1]	7 days until extraction, 40 days after extraction
Purgeables	624	Cool, 4°C 0.008% $Na_2S_2O_3$ [1]	14 days (3 days for acrolein and acrylonitrite)
Base/Neutral, Acids and Pesticides	625	Cool, 4°C 0.008% $Na_2S_2O_3$ [1] Adjust pH to 6-9 Store in dark	7 days until extraction, 40 days after extraction

[1] Should only be used in the presence of residual chlorine

[2] For diphenylnitrosamine only

[3] Aldrin only

Industrial TTO compliance monitoring procedures will vary between Control Authorities and between IUs regulated by a Control Authority. Some will take daily composite samples several times a year for each IU. Others will only take grab samples until noncompliance is found, which would then trigger a more frequent sample collection at the IU.

7.2 LABORATORY CONSIDERATIONS

Valid TTO discharge data not only hinges on proper sampling techniques, but also on the proper laboratory analysis of the samples collected. This section provides guidance for the IU and Control Authority in performing the necessary TTO analyses.

7.2.1 Analytical Procedures

Determination of TTO in an industrial process wastestream involves the analysis of the individual organic pollutant parameters specified in the applicable Categorical Standard. Procedures for the analysis of toxic organic pollutants have been mandated by EPA in Guidelines Establishing Test Procedures for the Analysis of Pollutants: Final Rule (40 CFR Part 136).

Generally, the EPA guidelines recognize two methods for organic pollutant analyses: gas chromatography (GC) with selective detectors or GC coupled with mass spectrophotometry (GC/MS). The GC methods are provided for the following 12 classes of organic pollutants:

- Purgeable Halocarbons (EPA Method 601)
- Purgeable Aromatics (EPA Method 602)
- Acrolein/Acrylonitrile (EPA Method 603)
- Phenols (EPA Method 604)
- Benzidenes (EPA Method 605)
- Phthalate Esters (EPA Method 606)
- Nitrosamines (EPA Method 607)
- Organochlorine Pesticides and PCBs (EPA Method 608)
- Nitroaromatics and Isophorone (EPA Method 609)
- Polynuclear Aromatic Hydrocarbons (EPA Method 610)
- Haloethers (EPA Method 611)
- Chlorinated Hydrocarbons (EPA Method 612).

The GC/MS methods can also be used to quantify organic pollutant levels in a sample. Although higher costs are associated with GC/MS analyses, simultaneous measurement of large numbers of organic pollutants are possible. Also GC/MS analyses can overcome specific interferences that would mask organic pollutant responses obtained with a GC. Three specific GC/MS methods have been promulgated by EPA:

- Purgeable (Method 624) - Determines volatile organic pollutant concentrations, including those parameters covered by GC Methods 601, 602, and 603

- Base/Neutral, Acids, and Pesticides (Method 625) - Determines numerous organic pollutant concentrations, including those parameters covered by GC Methods 604 through 612

- 2,3,7,8-Tetrachlorodibenzene-p-Dioxin (Method 613) - Determines concentration of 2,3,7,8-Tetrachlorodibenzene (TCDD).

The EPA procedures include quality control techniques, sample container requirements, and sample preservation procedures for toxic organic pollutants. All analytical laboratories utilized should have ready access to the October 26, 1984 Federal Register publication. This publication provides information necessary for a trained laboratory technician to perform all analyses required for TTO analysis.

7.2.2 Laboratory Quality Control

Although not as great as the error associated with poor sampling techniques, the potential for error occurring during analysis of industrial wastewater samples can have a great impact on the acceptability of TTO monitoring data. Without the aid of independent checks and general quality control, a laboratory may report erroneous results without being aware that a problem exists. Analytical quality control guidance is available from EPA in a document entitled Handbook for Analytical Quality Control in Water and Wastewater Laboratories (PB213884). This handbook is published by the EPA Technology Transfer Program and is available through NTIS. Specific information is provided that can guide the laboratory toward sound and reliable techniques and procedures.

7.3 OIL AND GREASE MONITORING CONSIDERATIONS

In lieu of monitoring for TTO, the following categorical standards allow an IU to alternatively monitor for oil and grease:

- Aluminum Forming (40 CFR 467) - All subcategories
- Coil Coating (40 CFR 465) - Subcategory D (Canmaking) only
- Copper Forming (40 CFR 468) - All subcategories.

This section provides guidance for the IU and Control Authority when monitoring for the alternative oil and grease parameter.

7.3.1 Oil and Grease Sampling Considerations

Due to the potential losses of oil and grease on sampling equipment (including containers), the collection of a composite oil and grease sample would not be representative of an industrial wastestream discharge. Therefore, separate oil and grease grab samples must be taken at regular intervals throughout a required monitoring time period and analyzed separately to obtain the average concentration over the monitoring period.

Sampling location considerations discussed previously in this chapter would still be valid when monitoring for oil and grease. Oil and grease samples must be taken in a glass bottle, preferably narrow mouth. To ensure an adequate volume of sample for oil and grease laboratory analysis, at least one-liter of sample must be collected. Once an oil and grease sample is collected, it must be preserved by lowering the sample pH to below 2 with concentrated 1+1 sulfuric acid (H_2SO_4) or concentrated hydrochloric acid (HCL) and stored at 4° C. All properly preserved oil and grease samples must be analyzed within 28 days of collection.

As discussed previously for TTC, the sampling frequency for oil and grease will depend on the type of monitoring being performed; either IU self-monitoring or Control Authority compliance monitoring. Regardless of the type, however, both the IU and Control Authority must ensure that the sampling frequency will be representative of the daily operations and subsequent process wastewater discharge of the IU.

7.3.2 Analytical Considerations for Oil and Grease

The EPA approved method for oil and grease analysis (liquid-liquid extraction with trichlorotrifluoroethane; gravametric) can be found in the following sources:

- Methods for Chemical Analysis of Water and Waste, Method 413.1 (1983), U.S. EPA, Cincinnati, Ohio. EPA-600/4-79-020.
- Standard Methods for the Examination of Water and Wastewater, Method 503A 15th Edition (1980), APHA, AWWA, WPCF, Washington, D.C.

The Coil Coating Regulation [40 CFR Part 465] delineates a specific procedure for analyzing wastewater samples to determine the concentration of oil and grease in the sample. Control Authorities and IUs subject to this regulation must use this procedure. The procedure is contained in Section 465.03(c) and is included in this manual in Appendix E.

Reference to the above documents should be made to ensure proper analysis of an oil and grease sample.

APPENDIX A

40 CFR Section 403.12

Reporting Requirements for POTWs and Industrial Users

the Approval Authority shall commence its review. Within 5 days after making a determination that a submission meets the requirements of §403.9(b), and where removal allowance approval is sought, §§403.7(d) and 403.9(d), or at such later time under §403.7(c) that the Approval Authority elects to review the removal allowance submission, the Approval Authority shall:

(1) Issue a public notice of request for approval of the submission:

(i) This public notice shall be circulated in a manner designed to inform interested and potentially interested persons of the Submission Procedure for the circulation of public notice shall include:

(A) Mailing notice of the request for approval of the Submission to designated 206 planning agencies, Federal and State fish, shellfish, and wildlife resource agencies; and to any other person or group who has requested individual notice, including those on appropriate mailing lists; and

(B) Publication of a notice of request for approval of the Submission in the largest daily newspaper within the jurisdiction(s) served by the POTW.

(ii) The public notice shall provide a period of not less than 30 days following the date of the public notice during which time interested persons may submit their written views on the Submission.

(iii) All written comments submitted during the 30 day comment period shall be retained by the Approval Authority and considered in the decision on whether or not to approve the Submissions. The period for comment may be extended at the discretion of the Approval Authority: and

(2) Provide an opportunity for the applicant, any affected State, any interested State or Federal agency person or group of persons to request a public hearing with respect to the Submission.

(i) This request for public hearing shall be filed within 30 day (or extended) comment period described in paragraph (b)(1)(ii) of this section and shall indicate the interest of the person filing such request and the reasons why a hearing is warranted.

(ii) The Approval Authority shall hold a hearing if the POTW so requests. In addition, a hearing will be held if there is a significant public interest in issues relating whether or not the Submission should be approved. Instances of doubt should be resolved in favor of holding the hearing.

(iii) Public notice of a hearing to consider a Submission and sufficient to inform interested parties of the nature of the hearing and the right to participate shall be published in the same newspaper as the notice of the original request for approval of the Submission under paragraph (b)(1)(i)(B) of this section. In addition, notice of the hearing shall be sent to those persons requesting individual notice.

(3) Whenever the approval Authority elects to defer review of a submission which authorizes the POTW to grant conditional revised discharge limits under §403.7(b)(2) and 403.7(c), the Approval Authority shall publish public notice of its election in accordance with paragraph (b)(1) of this section.

(c) Approval authority decision. At the end of the 30 day (or extended) comment period and within the 90 day (or extended) period provided for in paragraph (a) of this section, the Approval Authority shall approve or deny the Submission based upon the evaluation in paragraph (a)_ of this section, the section and taking into consideration comments submitted during the comment period and the record of the public hearing, if held. Where the Approval Authority makes a determination to deny the request, the Approval Authority shall so notify the POTW and each person who has requested individual notice. This notification shall include suggested modifications and the Approval Authority may allow the requestor additional time to bring the Submission into compliance with applicable requirements.

(d) EPA objection to Director's decision. No POTW pretreatment program or authorization to grant removal allowances shall be approved by the Director if following the 30 day (or extended) evaluation period provided for in paragraph (b)(1)(ii) of this section and any hearing held pursuant to paragraph (b)(2) of this section of the Regional Administrator sets forth in writing objections to the approval of such Submission and the reasons for such objections. A copy of the regional Administrator's objections shall be provided to the applicant, and each person who has requested individual notice. The Regional Administrator shall provide an opportunity for written comments and may convene a public hearing on his or her objections. Unless retracted, the Regional Administrator's objections shall constitute a final ruling to deny approval of a POTW pretreatment program or authorization to grant removal allowances 90 days after the date the objections are issued

(e) Notice of decision. The Approval Authority shall notify those persons who submitted comments and participated in the public hearing, if held, of the **approval or disapproval of the *Submission. In addition, the Approval*** Authority shall cause to be published a *notice of approval or disapproval in the same newspapers as the original notice* **of request for approval of the** Submission was published. The Approval Authority shall identify in any notice of POTW Pretreatment Program approval any authorization to modify categorical Pretreatment Standards which the POTW may make, in accordance with §403.7, for removal of pollutants subject to Pretreatment Standards.

(f) Public access to submission. The Approval Authority shall ensure that the Submission and any comments upon such Submission are available to the public for inspection and copying.

§403.12 Reporting requirements for POTW's and industrial users.

(a) Definition. The term "Control Authority" as it used in this section refers to: (1) The POTW if the POTW's Submission for its pretreatment program (§403.3(t)(1)) has been approved in accordance with the requirements of §403.11; or (2) the Approval Authority if the Submission has not been approved.

(b) Reporting Requirement for industrial users upon effective date of categorical pretreatment standard--baseline report. Within 180 day after the effective date of a categorical Pretreatment Standard, or 180 days after the final administrative decision made upon a category determination submission under §403.6(a)(4). whichever is later, existing Industrial User s subject to such categorical Pretreatment Standards and currently discharging to or scheduled to discharge to POTW shall be required to submit to the Control Authority a report which contains the information listed in paragraph (b)(1)--(7) of this section. Where reports containing this information already have been submitted to the Director or Regional Administrator in compliance with the requirements of 40 CFR 128.140(b), the industrial user will not be required to submit this information again. New sources shall be required to submit to the Control Authority a report which contains the information listed in paragraphs (b)(1)--(5) of this section:

(1) Identifying information. The user shall submit the name and address of the facility including the name of the operator or owners.

(2) Permits. The user shall submit a list of any environmental control permits held by or for the facility.

(3) Description of operations. The User shall submit a brief description of the nature, average rate of production

and Standard Industrial Classification of the operation(s) carried out by such Industrial User. This description should include a schematic process diagram which indicates points of Discharge to the POTW from the regulated processes.

(4) *Flow measurement.* The User shall submit information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from each of the following:

(i) regulated process streams; and

(ii) other streams as necessary to allow use of the combined wastestream formula of § 403.6(e). (See paragraph (b)(5)(v) of this section.)

The Control Authority may allow for verifiable estimates of these flows where justified by cost or feasibility considerations.

(5) *Measurement of Pollutants.* (i) The user shall identify the Pretreatment Standards applicable to each regulated process.

(ii) In addition, the User shall submit the results of sampling and analysis identifying the nature and concentration (or mass, where required by the Standard or Control Authority) of regulated pollutants in the Discharge from each regulated process. Both daily maximum and average concentration (or mass, where required) shall be reported. The sample shall be representative of daily operations.

(iii) Where feasible, samples must be obtained through the flow-proportional composite sampling techniques specified in the applicable categorical Pretreatment Standard. Where composite sampling is not feasible, a grab sample is acceptable.

(iv) Where the flow of the stream being sampled is less than or equal to 950,000 liters/day (approximately 250,000 gpd), the User must take three samples within a two-week period. Where the flow of the stream being sampled is greater than 950,000 liters/day (approximately 250,000 gpd), the User must take six samples within a two-week period.

(v) Samples should be taken immediately downstream from pretreatment facilities if such exist or immediately downstream from the regulated process if no pretreatment exists. If other wastewaters are mixed with the regulated wastewater prior to pretreatment the User should measure the flows and concentrations necessary to allow use of the combined wastestream formula of § 403.6(e) in order to evaluate compliance with the Pretreatment Standards. Where an alternate concentration or mass limit has been calculated in accordance with § 403.6(e) this adjusted limit along with supporting data shall be submitted to the Control Authority.

(vi) Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto. Where 40 CFR Part 136 does not contain sampling or analytical techniques for the pollutant in question, or where the Administrator determines that the Part 136 sampling and analytical techniques are inappropriate for the pollutant in question, sampling and analysis shall be performed by using validated analytical methods or any other applicable sampling and analytical procedures, including procedures suggested by the POTW or other parties, approved by the Administrator.

(vii) The Control Authority may allow the submission of a baseline report which utilizes only historical data so long as the data provides information sufficient to determine the need for industrial pretreatment measures.

(viii) The baseline report shall indicate the time, date and place, of sampling, and methods of analysis, and shall certify that such sampling and analysis is representative of normal work cycles and expected pollutant Discharges to the POTW.

(6) *Certification.* A statement, reviewed by an authorized representative of the Industrial User (as defined in subparagraph (k) of this section) and certified to by a qualified professional, indicating whether Pretreatment Standards are being met on a consistent basis, and, if not, whether additional operation and maintenance (O and M) and/or additional pretreatment is required for the Industrial User to meet the Pretreatment Standards and Requirements; and

(7) *Compliance Schedule.* If additional pretreatment and/or O and M will be required to meet the Pretreatment Standards; the shortest schedule by which the Industrial User will provide such additional pretreatment and/or O and M. The completion date in this schedule shall not be later than the compliance date established for the applicable Pretreatment Standard.

(i) Where the Industrial User's categorical Pretreatment Standard has been modified by a removal allowance (§ 403.7), the combined wastestream formula (§ 403.6(e)), and/or a Fundamentally Different Factors variance (§ 403.13) at the time the User submits the report required by paragraph (b) of this section, the information required by paragraphs (b)(6) and (7) of this section shall pertain to the modified limits.

(ii) If the categorical Pretreatment Standard is modified by a removal allowance (§ 403.7), the combined wastestream formula (§ 403.6(e)), and/or a Fundamentally Different Factors variance (§ 403.13) after the User submits the report required by paragraph (b) of this section, any necessary amendments to the information requested by paragraphs (b)(6) and (7) of this section shall be submitted by the User to the Control Authority within 60 days after the modified limit is approved.

(c) *Compliance Schedule for Meeting Categorical Pretreatment Standards.* The following conditions shall apply to the schedule required by paragraph (b)(7) of this section:

(1) The schedule shall contain increments of progress in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the Industrial User to meet the applicable categorical Pretreatment Standards (e.g., hiring an engineer, completing preliminary plans, completing final plans, executing contract for major components, commencing construction, completing construction, etc.).

(2) No increment referred to in paragraph (c)(1) of this section shall exceed 9 months.

(3) Not later than 14 days following each date in the schedule and the final date for compliance, the Industrial User shall submit a progress report to the Control Authority including, at a minimum, whether or not it complied with the increment of progress to be met on such date and, if not, the date on which it expects to comply with this increment of progress, the reason for delay, and the steps being taken by the Industrial User to return the construction to the schedule established. In no event shall more than 9 months elapse between such progress reports to the Control Authority.

(d) *Report on compliance with categorical pretreatment standard deadline.* Within 90 days following the date for final compliance with applicable categorical Pretreatment Standards or in the case of a New Source following commencement of the introduction of wastewater into the POTW, any Industrial User subject to Pretreatment Standards and Requirements shall submit to the Control Authority a report indicating the nature and concentration of all pollutants in the Discharge from the regulated process which are limited by Pretreatment Standards and Requirements and the average and maximum daily flow for these process

units in the Industrial User which are limited by such Pretreatment Standards and Requirements. The report shall state whether the applicable Pretreatment Standards or Requirements are being met on a consistent basis and, if not, what additional O and M and/or pretreatment is necessary to bring the Industrial User into compliance with the applicable Pretreatment Standards or Requirements. This statement shall be signed by an authorized representative of the Industrial User, as defined in paragraph (k) of this section, and certified to by a qualified professional.

(e) *Periodic reports on continued compliance.* (1) Any Industrial User subject to a categorical Pretreatment Standard, after the compliance date of such Pretreatment Standard, or, in the case of a New Source, after commencement of the discharge into the POTW, shall submit to the Control Authority during the months of June and December, unless required more frequently in the Pretreatment Standard or by the Control Authority or the Approval Authority, a report indicating the nature and concentration of pollutants in the effluent which are limited by such categorical Pretreatment Standards. In addition, this report shall include a record of measured or estimated average and maximum daily flows for the reporting period for the Discharge reported in paragraph (b)(4) of this section except that the Control Authority may require more detailed reporting of flows. At the discretion of the Control Authority and in consideration of such factors as local high or low flow rates, holidays, budget cycles, etc., the Control Authority may agree to alter the months during which the above reports are to be submitted.

(2) Where the Control Authority has imposed mass limitations on Industrial Users as provided for by § 403.5(d), the report required by paragraph (e)(1) of this section shall indicate the mass of pollutants regulated by Pretreatment Standards in the Discharge from the Industrial User.

(f) *Notice of slug loading.* The Industrial User shall notify the POTW immediately of any slug loading, as defined by § 403.5(b)(4), by the Industrial User.

(g) *Monitoring and analysis to demonstrate continued compliance.* The reports required in paragraphs (b)(5), (d), and (e) of this section shall contain the results of sampling and analysis of the Discharge, including the flow and the nature and concentration, or production and mass where requested by the Control Authority, of pollutants contained therein which are limited by the applicable Pretreatment Standards. The frequency of monitoring shall be prescribed in the applicable Pretreatment Standard. All analyses shall be performed in accordance with procedures established by the Administrator pursuant to section 304(g) of the Act and contained in 40 CFR Part 136 and amendments thereto or with any other test procedures approved by the Administrator. Sampling shall be performed in accordance with the techniques approved by the Administrator. Where 40 CFR Part 136 does not include sampling or analytical techniques for the pollutants in question, or where the Administrator determines that the Part 136 sampling and analytical techniques are inappropriate for the pollutant in question, sampling and analyses shall be performed using validated analytical methods or any other sampling and analytical procedures, including procedures suggested by the POTW or other parties, approved by the Administrator.

(h) *Compliance schedule for POTW's.* The following conditions and reporting requirements shall apply to the compliance schedule for development of an approvable POTW Pretreatment Program required by § 403.8.

(1) The schedule shall contain increments of progress in the form of dates for the commencement and completion of major events leading to the development and implementation of a POTW Pretreatment Program (e.g., acquiring required authorities, developing funding mechanisms, acquiring equipment);

(2) No increment referred to in paragraph (h)(1) of this section shall exceed nine months;

(3) Not later than 14 days following each date in the schedule and the final date for compliance, the POTW shall submit a progress report to the Approval Authority including, as a minimum, whether or not it complied with the increment of progress to be met on such date and, if not, the date on which it expects to comply with this increment of progress, the reason for delay, and the steps taken by the POTW to return to the schedule established. In no event shall more than nine months elapse between such progress reports to the Approval Authority.

(i) *Initial POTW report on compliance with approved removal allowance.* A POTW which has received authorization to modify categorical Pretreatment Standards for pollutants removed by the POTW in accordance with the requirements of § 403.7 must submit to the Approval Authority within 90 days after the effective date of a Pretreatment Standard for which authorization to modify has been approved, a report which contains the information required by §§ 403.7(d)(2), 403.7(d)(3) and 403.7(d)(6). A minimum of one sample per month during the reporting period is required.

(j) *Periodic reports by POTW to demonstrate continued compliance with removal allowance.* The reports referred to in paragraph (i) of this section will be submitted to the Approval Authority at 6-month intervals beginning with the submission of the initial report referred to in paragraph (i) of this section unless required more frequently by the Approval Authority.

(k) *Signatory requirements for industrial user reports.* The reports required by paragraphs (b), (d), and (e), of this section must be signed by an authorized representative of the Industrial User. An authorized representative may be:

(1) A principal executive officer of at least the level of vice president, if the Industrial User submitting the reports required by paragraphs (b), (d) and (e) of this section is a corporation.

(2) A general partner or proprietor if the Industrial User submitting the report required by paragraphs (b), (d) and (e) of this section is a partnership or sole proprietorship respectively.

(3) A duly authorized representative of the individual designated in subparagraph (1) or (2) of this paragraph if such representative is responsible for the overall operation of the facility from which the Indirect Discharge originates.

(l) *Signatory requirements for POTW reports.* Reports submitted to the Approval Authority by the POTW in accordance with paragraphs (h), (i) and (j) of this section must be signed by a principal executive officer, ranking elected official or other duly authorized employee if such employee is responsible for overall operation of the POTW.

(m) *Provisions governing fraud and false statements.* The reports required by paragraphs (b), (d), (e), (h), (i) and (j) of this section shall be subject to the provisions of 18 U.S.C. section 1001 relating to fraud and false statements and the provisions of section 309(c)(2) of the Act governing false statements, representations or certifications in reports required under the Act.

(n) *Record-keeping requirements.*

(1) Any Industrial User and POTW subject to the reporting requirements established in this section shall maintain records of all information resulting from any monitoring activities required by this section. Such records shall include for all samples:

(i) The date, exact place, method, and time of sampling and the names of the person or persons taking the samples;

(ii) The dates analyses were performed;

(iii) Who performed the analyses;

(iv) The analytical techniques/methods use; and

(v) The results of such analyses.

(2) Any Industrial User or POTW subject to the reporting requirements established in this section shall be required to retain for a minimum of 3 years any records of monitoring activities and results (whether or not such monitoring activities are required by this section) and shall make such records available for inspection and copying by the Director and the Regional Administrator (and POTW in the case of an Industrial User). This period of retention shall be extended during the course of any unresolved litigation regarding the Industrial User or POTW or when requested by the Director or the Regional Administrator.

(3) Any POTW to which reports are submitted by an Industrial User pursuant to paragraphs (b), (d), and (e) of this section shall retain such reports for a minimum of 3 years and shall make such reports available for inspection and copying by the Director and the Regional Administrator. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Industrial User or the operation of the POTW Pretreatment Program or when requested by the Director or the Regional Administrator.

§ 403.13 Variances from categorical pretreatment standards for fundamentally different factors.

(a) *Definition.* The term "Requester" means an Industrial User or a POTW or other interested person seeking a variance from the limits specified in a categorical Pretreatment Standard.

(b) *Purpose and scope.* In establishing categorical Pretreatment Standards for existing sources, the EPA will take into account all the information it can collect, develop and solicit regarding the factors relevant to pretreatment standards under section 307(b). In some cases, information which may affect these Pretreatment Standards will not be available or, for other reasons, will not be considered during their development. As a result, it may be necessary on a case-by-case basis to adjust the limits in categorical Pretreatment Standards, making them either more or less stringent as they apply to a certain Industrial User within an industrial category or subcategory. This will only be done if data specific to that Industrial User indicates it presents factors fundamentally different from those considered by EPA in developing the limit at issue. Any interested person believing that factors relating to an Industrial User are fundamentally different from the factors considered during development of a categorical Pretreatment Standard applicable to that User and further, that the existence of those factors justifies a different discharge limit from that specified in the applicable categorical Pretreatment Standard, may request a fundamentally different factors variance under this section or such a variance request may be initiated by the EPA.

(c) *Criteria.*—(1) *General criteria.* A request for a variance based upon fundamentally different factors shall be approved only if:

(i) There is an applicable categorical Pretreatment Standard which specifically controls the pollutant for which alternative limits have been requested; and

(ii) Factors relating to the discharge controlled by the categorical Pretreatment Standard are fundamentally different from the factors considered by EPA in establishing the Standards; and

(iii) The request for a variance is made in accordance with the procedural requirements in paragraphs (g) and (h) of this section.

(2) *Criteria applicable to less stringent limits.* A variance request for the establishment of limits less stringent than required by the Standard shall be approved only if:

(i) The alternative limit requested is no less stringent than justified by the fundamental difference;

(ii) The alternative limit will not result in a violation of prohibitive discharge standards prescribed by or established under § 403.5;

(iii) The alternative limit will not result in a non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the Pretreatment Standards; and

(iv) Compliance with the Standards (either by using the technologies upon which the Standards are based or by using other control alternatives) would result in either:

(A) A removal cost (adjusted for inflation) wholly out of proportion to the removal cost considered during development of the Standards; or

(B) A non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the Standards.

(3) *Criteria applicable to more stringent limits.* A variance request for the establishment of limits more stringent than required by the Standards shall be approved only if:

(i) The alternative limit request is no more stringent than justified by the fundamental difference; and

(ii) Compliance with the alternative limit would not result in either:

(A) A removal cost (adjusted for inflation) wholly out of proportion to the removal cost considered during development of the Standards; or

(B) A non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the Standards.

(d) *Factors considered fundamentally different.* Factors which may be considered fundamentally different are:

(1) The nature or quality of pollutants contained in the raw waste load of the User's process wastewater;

(2) The volume of the User's process wastewater and effluent discharged;

(3) Non-water quality environmental impact of control and treatment of the User's raw waste load;

(4) Energy requirements of the application of control and treatment technology;

(5) Age, size, land availability, and configuration as they relate to the User's equipment or facilities; processes employed; process changes; and engineering aspects of the application of control technology;

(6) Cost of compliance with required control technology.

(e) *Factors which will not be considered fundamentally different.* A variance request or portion of such a request under this section may not be granted on any of the following grounds:

(1) The feasibility of installing the required waste treatment equipment within the time the Act allows;

(2) The assertion that the Standards cannot be achieved with the appropriate waste treatment facilities installed, if such assertion is not based on factors listed in paragraph (d) of this section;

(3) The User's ability to pay for the required waste treatment; or

(4) The impact of a Discharge on the quality of the POTW's receiving waters.

(f) *State or local law.* Nothing in this section shall be construed to impair the right of any state or locality under section 510 of the Act to impose more stringent limitations than required by Federal law.

(g) *Application deadline.*

(1) Requests for a variance and supporting information must be submitted in writing to the Director or to the Enforcement Division Director, as appropriate.

(2) In order to be considered, request for variances must be submitted within

APPENDIX B

ELECTROPLATING & METAL FINISHING CATEGORY:

List of Toxic Organic Compounds Regulated as a Component of Total Toxic Organics

APPENDIX B

TOXIC ORGANIC COMPOUNDS REGULATED
UNDER ELECTROPLATING & METAL FINISHING TTO PRETREATMENT STANDARD

Acenaphthene

Acrolein

Acrylonitrile

Benzene

Benzidine

Carbon tetrachloride
(tetrachloromethane)

Chlorobenzene

1,2,4-trichlorobenzene

Hexachlorobenzene

1,2-dichloroethane

1,1,1-trichloroethane

Hexachloroethane

1,1-dichloroethane

1,1,2-trichloroethane

1,1,2,2-tetrachloroethane

Chloroethane

Bis (2-chloroethyl) ether

2-chloroethyl vinyl ether (mixed)

2-chloronaphthalene

2,4,6-trichlorophenol

Parachlorometa cresol

chloroform (trichloromethane)

2-chlorophenol

1,2-dichlorobenzene

1,3-dichlorobenzene

1,4-dichlorobenzene

N-nitrosodi-n-propylamine

Pentachlorophenol

Phenol

Bis (2-ethylhexyl) phthalate

Butyl benzyl phthalate

Di-n-butyl phthalate

Di-n-octyl phtalate

Diethyl phthalate

Dimethyl phthalate

1,2-benzanthracene
(benzo(a)anthracene)

Benzo(a)pyrene (3,4-benzopyrene)

3,4-Benrofluoranthene
(benzo(b)fluoranthene)

11,12-benzofluoranthene
(benzo(k)fluoranthene)

Chrysene

Acenaphthylene

Anthracene

1,12-benzoperylene
(benzo(ghi)perylene)

Fluorene

Phenanthrene

1,2,5,6-dibenzanthracene
(dibenzo(a,h)anthracene)

Indeno (1,2,3-cd)pyrene
(2,3-o-phenylene pyrene)

Pyrene

Tetrachloroethylene

Toluene

Trichloroethylene

Vinyl Chloride (chloroethylene)

3,3-dichlorobenzidine

1,1-dichloroethylene

1,2-trans-dichloroethylene

2,4-dichlorophenol

1,2-dichloropropane
(1,3-dichloropropene)

2,4-dimethylphenol

4-chlorophenyl phenyl ether

4-bromophenyl phenyl ether

Bis (2-chloroisopropyl) ether

Bis (2-chlolroethoxy) methane

Methylene chloride (dichloronethane)

Methyl chloride (chloromethane)

Methyl bromide (bromomethane)

Bromoform (tribromomethane)

Dichlorobromomethane

Chlorodibromomethane

Hexachlorobutadiene

Hexachlorocyclopentadiene

Isophorone

Naphthalene

Nitrobenzene

2-nitrophenol

4-nitrophenol

2,4-dinitrophenol

N-nitrosodimethylamine

N-nitrosodiphenylamine

Aldrin

Dieldrin

Chlordane (technical mixture and metabolites)

4,4-DDT

4,4-DDE (p,p-DDX)

4,4-DDD (p,p-TDE)

Alpha-endosulfan

Beta-endosulfan

2,6-dinitrotoluene

1,2-diphenylhydrazine

Ethylbenzene

Fluoranthene

Heptachlor epoxide (BHC - hexachlorocyclohexane)

Alpha-BHC

Beta-BHC

Gamma-BHC

Delta-BHC

(PCB-polychlorinated biphenyls)
PCB-1242 (Arochlor 1242)

PCB-1254 (Arochlor 1254)

PCB-1221 (Arochlor 1221)

PCB-1232 (Arochlor 1232)

PCB-1248 (Arochlor 1248)

PCB-1260 (Arochlor 1260)

PCB-1016 (Arochlor 1016)

Toxaphene

2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

Endosulfan sulfate

Endrin

Endrin aldehyde

Heptachlor

4,6-dinitro-o-cresol

2,4-dinitrotoluene

APPENDIX C

ELECTRICAL AND ELECTRONIC COMPONENTS CATEGORY

List of Toxic Organic Compounds Regulated as a Component of Total Toxic Organics (By Subcategory)

APPENDIX C

TOXIC ORGANIC COMPOUNDS REGULATED UNDER ELECTRICAL AND ELECTRONIC COMPONENTS TTO PRETREATMENT STANDARDS

Subcategories A and B (Seminconductors and Electronic Crystals)

1,2,4 trichlorobenzene chloroform

1,2 dichlorobenzene

1,3 dichlorobenzene

1,4 dichlorobenzene ethylbenzene

1,1,1 trichloroethane methylene chloride napthalene

2 nitrophenol phenol bis (2-ethylhexyl) phthalate tetrachloroethylene toluene trichloroethylene

2 chlorophenol

2,4 dichlorophenol

4 notrophenol pentachlorophenol di-n-butyl

1,2 diphenylhydrazine isophorone butyl benzyl phthalate

1,1 dichloroethylene

2,4,6 trichlorophenol carbon tetrachloride

1,2 dichloroethane

1,1,2 trichloroethane dichlorobromoethane

Subcategory C (Cathode Ray Tubes)

chloroform

trichloroethane

methylene chloride

bis(2-ethylhexyl) phthalate

toluene

trichloroethylene

APPENDIX D

Analytical Procedure for Determining Oil and Grease Concentrations Under Coil Coating Regulation

APPENDIX D

TOXIC ORGANIC MANAGEMENT PLAN
ABC REFRIGERATION CORPORATION
HIGH POINT PLANT

I. Description of Facilities and Solvent Use

A. Process Description

The ABC Refrigeration Corporation, High Point Plant, manufactures automotive radiators, condensers, and compressors from metal coils and metal castings manufactured by other suppliers. The forming and assembly processes include metal forming, degreasing, chromating, and brazing in preparation for painting and final assembly. The metal castings are machined, washed, assembled, and degreased prior to final assembly.

Wastewater types and volumes and the current wastewater treatment system are depicted in Figure 1. The primary sources of process wastewater are the degreasing, chromating, fluxing, and parts washing operations. Other sources of wastewater are cooling tower blowdown and boiler blowdown. Wastewater from the degreasing operations is treated by dispersed air floatation for oil and grease removal and then discharged to a combined wastestream containing the wastewater from all other sources. The combined wastestream is then treated by coagulation/flocculation with chemical and polymer addition for solids and metals reduction. The treated effluent is discharged to the city sewer system.

B. Identification of Toxic Organic Chemicals Entering the Plant Wastewaters

1. Chemical Analysis of Treated Wastewaters

Samples were taken of the plant's treated wastewaters for analysis for the 110 toxic organics regulated under the metal finishing categorical pretreatment standards. Samples collected were 24-hour flow proportioned composite samples for acid extractible and base/neutral compounds. Grab samples for volatile organics were taken every four hours and were composited before analysis. Samples were taken over a period when all production lines were operating at peak production rates. Samples were analyzed by gas chromatography with compound identification and quantification by mass spectrophotometer (GC/MS). EPA procedures 624 and 625 were followed for GC/MS analysis. Toxic organic compounds detected at concentrations greater than 0.01 mg/l are listed in Table 1.

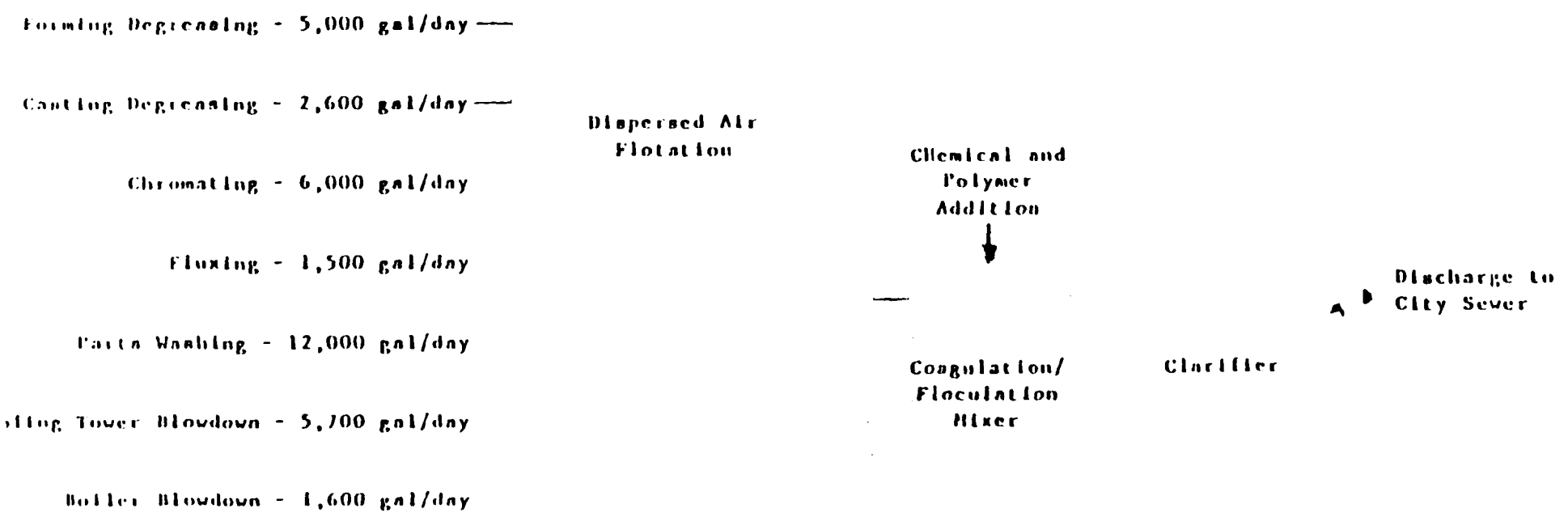


FIGURE 1

WASTEWATER GENERATION AND TREATMENT
ABC REFRIGERATION CORPORATION HIGH POINT PLANT

Table 1

Compound	Concentration (mg/l)
1,1,1-Trichloroethane	1.320
Napthalene	0.210
Chloroethane	0.131
Benzene	0.532
Phenol	0.681

2. Identification of Solvents Used in Manufacturing Operations

a. Greasefree is a degreasing solvent used in the forming process. Greasefree's principle ingredient is 1,1,1-trichloroethane. We have contacted the manufacturer of Greasefree, Doubt Chemical Corporation, who informs us that their analysis of Greasefree indicates that no other priority toxic pollutants are contained in Greasefree. Doubt's letter confirming its analysis is enclosed as Attachment 1.

b. Rinsewash is a degreasing solvent used in the metal castings process. Rinsewash is a multicomponent solvent we purchase from Pound Chemical Corporation. At our request Pound has analyzed Rinsewash and found it contains napthalene, benzene, and phenol. Pound represents that no other toxic organic pollutants were identified in its analysis of Rinsewash. Pound's letter documenting its analysis is enclosed as Attachment 2.

c. Rustaway is a corrosion inhibitor used during the metal castings washing process to prevent rust formation. We buy Rustaway from the Exit Chemicals Corporation. The primary ingredient of Rustaway is carbon disulfide. Exit refused our request for a chemical analysis of Rustaway. We, therefore, submitted an aliquot of Rustaway to Whatsinit Laboratories, Inc. for analysis. Whatsinit's report is enclosed as Attachment 3 and documents that Rustaway contains chloroethane. No other toxic organics were detected.

3. Identification of Other Potential Sources of Toxic Organic Pollutant Introduction to the Wastewater Treatment System

a. Durable Paints are used to finish the forming process items. Although not detected in the wastewater analysis, Durable Paints are known to contain toluene. The floor drains in the forming process painting area discharge to the wastewater treatment system. Therefore, any spilled paint would enter the process wastewater treatment system.

b. Degreasing Areas - Floor drains in both degreasing areas similarly are connected to the main wastewater system. Therefore, spills of degreasing agents could enter the treatment system.

c. Solvent Storage Areas - Solvents, paints, and corrosion inhibitors are stored in bulk quantities in four different areas of the plant--the two degreasing areas, the washing area, and the painting area. Spills could occur by accidental dumping, spillage during routine transfer, etc. Such spills would enter the wastewater treatmert system through the floor drains.

II. Description of Control Options Explored

A. Solvent Substitution

For the degreasing, corrosion inhibitor, and painting sources of toxic organics, ABC explored the feasibility of substituting another product that does not contain toxic organic materials. Obviously, this would be the most effective manner of eliminating toxic organic discharges both from process operations and from potential spillage into floor drains. ABC obtained samples of degreasing agents, corrosion inhibitors, and paints that do not contain toxic organics from vendors and conducted pilot tests of their effectiveness. ABC concluded after these tests that the alternative degreasing agents and paints could not be used without adversely affecting the process and final products. The alternative degreasing agents were not nearly as effective as the ones currently used and, therefore, would impair the effectiveness of subsequent operations. Alternative paints could not be applied evenly to our products. One alternative corrosion inhibitor, Chromisorb, appears to be an acceptable alternative to the Rustaway and contains the toxic metals zinc and chromium. Thus, the option of eliminating chloroethane discharges by substituting Chromasorb for Rustaway as a corrosion inhibitor was considered.

B. Process Modifications

The major alternative to the substitution of degreasing agents is to institute changes in the degreasing process that do not result in wastewater discharge. This would be accomplished by wiping parts rather than rinsing them. After a thorough wipedown, parts would be air dried in an area under a vacuum hood. The vacuum hood is integrated with the facility's air pollution control devices. Any material used for wiping would, of course, be treated as a hazardous material. It would be transferred to drums and disposed of to a licensed disposer or reclaimer. Thus, process changes could be made that would eliminate discharge of process wastewaters containing 1,1,1-trichloroethane, napthalene, benzene, and phenol. Solid waste generation would, of course, increase.

C. Segregated Drain System

Spills of toxic organics could be eliminated from the process wastewater stream if a segregated floor drain system were constructed. ABC investigated this option and found that, because of the location of some existing drain pipes, such modification would require a major disruption of the plant and would cost far more than routine TTO monitoring. Moreover, such an option would create a significant additional wastewater treatment problem for those cases in which drained water is not contaminated by spilled material.

D. Sealing Floor Drains

Introduction of toxic organics to wastewaters through floor drains could be eliminated if floor drains were sealed. In the process areas this option is not feasible because of State safety requirements. In storage areas, however, such an option may be practical.

E. Installing Sumps in the Floor Drains

Under this option sumps would be installed such that prior to entering the drain, floor waters would pass through a sump or holding tank. The sump would be as large as the largest spill of solvent reasonably expected plus a 10 percent freeboard allowance. Thus, if a solvent spilled, the discharge to the drain would be turned off. The solvent could, then, collect in the sump and be recovered.

III. Toxic Organic Management Plan

As a result of the above analyses, ABC believes that all of its toxic organic pollutant discharges can be controlled by a toxic organic management plan in lieu of routine toxic organic monitoring.

A. Solvent Substitution

Discharge of chloroethane will be eliminated by use of a substitute rust inhibitor. ABC will discontinue use of Rustaway as a rust inhibitor. Instead, ABC will use Chromasorb to prevent rust formation in its metal casting line. Chromasorb is a zinc-chromate rust inhibitor that can be used to prevent rust formation in place of Rustaway. Chromasorb contains the toxic metals chromium and zinc. The existing wastewater treatment system, however, is designed to remove metallic pollutants. By adjustment of the chemical and polymer feed, ABC anticipates that it can maintain current levels of metals discharge while eliminating chloroethane discharges.

B. Process Changes

ABC will eliminate discharge of process wastewaters containing 1,1,1-trichloroethane, napthalene, benzene, and phenol by instituting changes in the degreasing process. Solvent cleaning will be accomplished by immersion and manual wipedown. Parts will be allowed to air dry in an area covered by a vacuum hood prior to any water washing. Materials used for wipedown will be collected in drums, sealed, stored in a secure area and transferred to Usitagin Reclamation Company. Usitagin is a licensed hazardous waste disposer.

C. Solvent Storage Procedures

Storage procedures for all solvents containing toxic organic compounds will be changed. Storage will be in a central location for all such materials, including paints. The storage area will be diked to contain a volume equal to the largest container stored, 55 gallons, plus 50 percent. There will be no floor drains in this area.

All incoming containers of solvents or paints will be labeled upon receipt with the following information:

```
**********************************************************************
* Material Contains Regulated Organic Solvents                       *
*                                                                    *
* 1.  Use only in designated areas                                   *
*                                                                    *
* 2.  Do not permit this material to enter plant wastewater          *
*     stream                                                         *
*                                                                    *
* 3.  Dispose of only in designated and identified containers        *
*                                                                    *
**********************************************************************
```

All in-plant usage containers will also be marked with the above information.

D. Installation of Sumps in Process Areas

In all process areas where materials containing toxic organic compounds are used, sumps will be installed prior to any floor drains. The sumps will be designed to allow rapid shut-off of flow to the drain and to hold a volume equal to the largest container of solvent used in that area plus ten percent.

E. Spent Solvent Disposal Practices

Spent solvents are collected in 55 gallon drums, sealed, and stored in an existing, secured storage area. The storage area contains no floor drains. ABC sells spent solvent to the Usitagin Reclamation Company.

F. Training

All personnel involved in degreasing, chromating, painting, and clean-up activities will receive instruction in the proper handling and disposal of solvents and clean-up materials in order to keep regulated toxic organics out of industrial wastewater. New employees will be trained in these procedures immediately. All personnel working in these activities are familiar with this toxic organic management plan and will follow the procedure established in that standard to eliminate regulated organics from entering the water wash system.

Training consists of classroom instruction which reviews the following:

1. The organic solvents and cleaners known to be in use at the plant and the areas in which they are used.

2. The location of lift stations and drains with emphasis upon the location of pretreatment sewer systems for each area in the plant.

3. The Toxic Organic Management Plan and the proper procedures for handling and disposing of the respective solvents.

G. Inspections

1. Degreasers, spray booths, and cleaning operations will be inspected routinely by the area supervisor to verify cleaning procedures and adherence to this Toxic Organic Management Plan to insure that TTO does not spill or leak into plant sewers.

2. Centrally located cleaning and solvent handling, reuse, and collection areas, as well as raw material and waste solvent storage areas, will be inspected weekly by a designated environmental representative to verify proper solvent storage, handling, and collection. A log of inspections and sign-off will be maintained by the designated environmental representative.

H. Implementation

All provisions of this plan will be fully implemented by April 1, 1984.

IV. Certification

"Based on my inquiry of the person or persons directly responsible for managing compliance with the TTO limitations, I certify that, to the best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewaters has occurred since filing of the last report. I further certify that this facility is implementing this toxic organic pollutant management plan submitted to the Control Authority on January 2, 1984."

John Smith
Plant Manager
High Point Plant
Telephone: (617) 617-6176

APPENDIX E

Analytical Procedure for Determining Oil and Grease Concentrations Under Coil Coating Regulation

§465.03 Monitoring and reporting requirements

(c) The following determination method shall be used for the determination of the concentration of oil and grease in wastewater samples from all subcategories of coil coating (Based on Standards Methods, 15th Edition. methods 503A and 503E). In this method, a partition gravimetric procedure is used to determine hydrocarbon (petroleum based) oil and grease (O&G-E).

(1) Apparatus. (i) Separatory funnel. 1 liter, with TFE stopcock.

(ii) Glass stoppered flask, 125 ml.

(iii) Distilling flask, 125 ml.

(iv) Water bath.

(v) Filter paper, 11 cm diameter.[2]

(vi) Glass Funnel.

(vii) Magnetic stirrer and Teflon coated stir bar.

(2) Reagents. (i) Hydrochloric acid. HCl. 1+1.

(ii) Trichlorotrifluoroethane.[3] (1.1.2-trichloro-1.2.2-trifluoroethane), boiling point 47°C. The solvent should leave no measurable residue on evaporation: distill if necessary. Do not use any plastic tubing to transfer solvent between containers.

(iii) Sodium sulfate. Na_2SO_4 anhydrous crystal.

(iv) Silica gel, 60 to 200 mesh. Dry at 110°C for 24 hours and store in a tightly sealed container.

(3) Procedure. To determine hydrocarbon oil and grease, collect about 1 liter of sample and mark sample level in a bottle for later determination of sample volume. Acidify to pH 2 or lower; generally, 5 ml HCl is sufficient Transfer to separatory funnel. Carefully rinse sample bottle with 30 ml trichlorofluoroethane and add solvent washings to separatory funnel. Preferably shake vigorously for 2 minutes. However, if it is suspected that a stable emulsion will form, shake gently for 5 to 10 minutes. Let layers separate. Drain solvent layer through a funnel containing solvent-moistened filter paper into a tared clean flask. If a clear solvent layer cannot be obtained. add 1g Na_2SO_4 to the filter paper cone and slowly drain emulsified solvent onto the crystals. Add more Na_2SO_4 if necessary. Extract twice more with 30 ml solvent each but first rinse sample container with each solvent portion. Combine extracts in tared flask and wash filter with an additional 10 to 20 ml. solvent. Add 3.0 g silica gel. Stopper flask and stir on a magnetic stirrer for 5 minutes. Filter solution through filter paper and wash silica gel and filter paper with 10 ml solvent and combine with filtrate in tared distilling flask. Distill solvent from distilling flask in a water bath at 70°C. Place flask on a water bath at 70°C for 15 minutes and draw air through it with an applied vacuum for the final 1 minute. Cool in a desiccator for 30 minutes and weigh.

(4) Calculations.-Calculation of O&G-E: If the organic solvent is free of residue the gain in weight of the tared distilling flask is due to hydrocarbon oil and grease. Total gain in weight, E, is the amount of hydrocarbon oil and grease in the sample (mg):

mg (hydrocarbon oil and grease)/1 =

(3) Use of O&G-E: The value, O&G-E shall be used as the measure of compliance with oil and grease limitations and standards set forth in this regulation except where total O&G is specifically required.

[1]Teflon or equivalent.

[2]Whatman No. 40 or equivalent.

[3]Freon or equivalent.

[4]Davidson Grade 950 or equivalent.

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