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Subpart P—Wood Furniture and Fixture Production With Water Wash Spray Booth(s) or With Laundry Facilities Subcategory

§ 429.170 Applicability; description of the wood furniture and fixture production with water wash spray booth(s) or with laundry facilities subcategory.

This subpart applies to discharges to waters of the United States and to the introduction of process wastewater pollutants into publicly owned treatment works from the manufacture of wood furniture and fixtures at establishments that either (a) utilize water wash spray booth(s) to collect and contain the overspray from spray applications of finishing materials, or (b) utilize on-site laundry facilities for fabric utilized in various finishing operations.

§ 429.171 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology (BPT): Settleable solids shall be less than or equal to 0.2 ml/l and pH shall be between 6.0 and 9.0 at all times.

§ 429.172 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). [Reserved]

§ 429.173 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): There shall be no discharge of process wastewater pollutants.

§ 429.174 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS): There shall be no discharge of process wastewater pollutants.

§ 429.175 Pretreatment standards for existing sources (PSES).

Any existing source subject to this subpart which introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR part 403.

§ 429.176 Pretreatment standards for new sources (PSNS).

Any new source subject to this subpart which introduces process wastewater pollutants into a publicly owned treatment works must comply with 40 CFR part 403.

PART 430—THE PULP, PAPER, AND PAPERBOARD POINT SOURCE CATEGORY

GENERAL PROVISIONS

Sec.
430.00 Applicability.
430.01 General definitions.
430.02 Monitoring requirements.
430.03 Best management practices (BMPs) for spent pulping liquor, soap, and turpentine management, spill prevention, and control.

Subpart A—Dissolving Kraft Subcategory

430.10 Applicability; description of the dissolving kraft subcategory.
430.11 Specialized definitions.
430.12 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.14 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).

430.15 New source performance standards (NSPS).
430.16 Pretreatment standards for existing sources (PSES).
430.17 Pretreatment standards for new sources (PSNS).

Subpart B—Bleached Papergrade Kraft and Soda Subcategory

430.20 Applicability; description of the bleached papergrade kraft and soda subcategory.
430.21 Specialized definitions.
430.22 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.23 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.24 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.25 New source performance standards (NSPS).
430.26 Pretreatment standards for existing sources (PSES).
430.27 Pretreatment standards for new sources (PSNS).
430.28 Best management practices (BMPs).

Subpart C—Unbleached Kraft Subcategory

430.30 Applicability; description of the unbleached kraft subcategory.
430.31 Specialized definitions.
430.32 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.33 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.34 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.35 New source performance standards (NSPS).
430.36 Pretreatment standards for existing (PSES).
430.37 Pretreatment standards for new sources (PSNS).

Subpart D—Dissolving Sulfite Subcategory

430.40 Applicability; description of the dissolving sulfite subcategory.
430.41 Specialized definitions.
430.42 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.43 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.44 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.45 New source performance standards (NSPS).
430.46 Pretreatment standards for existing sources (PSES).
430.47 Pretreatment standards for new sources (PSNS).

Subpart E—Papergrade Sulfite Subcategory

430.50 Applicability; description of the papergrade sulfite subcategory.
430.51 Specialized definitions.
430.52 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.53 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.54 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.55 New source performance standards (NSPS).
430.56 Pretreatment standards for existing sources (PSES).
430.57 Pretreatment standards for new sources (PSNS).
430.58 Best management practices (BMPs).

Subpart F—Semi-Chemical Subcategory

430.60 Applicability; description of the semi-chemical subcategory.
430.61 Specialized definitions.
430.62 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.63 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.64 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.65 New source performance standards (NSPS).
430.66 Pretreatment standards for existing sources (PSES).

430.67 Pretreatment standards for new sources (PSNS).

Subpart G—Mechanical Pulp Subcategory

430.70 Applicability; description of the mechanical pulp subcategory.
430.71 Specialized definitions.
430.72 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.73 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.74 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.75 New source performance standards (NSPS).
430.76 Pretreatment standards for existing sources (PSES).
430.77 Pretreatment standards for new sources (PSNS).

Subpart H—Non-Wood Chemical Pulp Subcategory

430.80 Applicability; description of the non-wood chemical pulp subcategory.
430.81 Specialized definitions.
430.82 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT). [Reserved]
430.83 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT). [Reserved]
430.84 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT). [Reserved]
430.85 New source performance standards (NSPS). [Reserved]
430.86 Pretreatment standards for existing sources (PSES). [Reserved]
430.87 Pretreatment standards for new sources (PSNS). [Reserved]

Subpart I—Secondary Fiber Deink Subcategory

430.90 Applicability; description of the secondary fiber deink subcategory.
430.91 Specialized definitions.
430.92 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.93 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.94 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.95 New source performance standards (NSPS).
430.96 Pretreatment standards for existing sources (PSES).
430.97 Pretreatment standards for new sources (PSNS).

Subpart J—Secondary Fiber Non-Deink Subcategory

430.100 Applicability; description of the secondary fiber non-deink subcategory.
430.101 Specialized definitions.
430.102 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.103 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.104 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.105 New source performance standards (NSPS).
430.106 Pretreatment standards for existing sources (PSES).
430.107 Pretreatment standards for new sources (PSNS).

Subpart K—Fine and Lightweight Papers From Purchased Pulp Subcategory

430.110 Applicability; description of the fine and lightweight papers from purchased pulp subcategory.
430.111 Specialized definitions.
430.112 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.113 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.114 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.115 New source performance standards (NSPS).
430.116 Pretreatment standards for existing sources (PSES).

430.117 Pretreatment standards for new sources (PSNS).

Subpart L—Tissue, Filter, Non-Woven, and Paperboard From Purchased Pulp Subcategory

430.120 Applicability; description of the tissue, filter, non-woven, and paperboard from purchased pulp subcategory.
430.121 Specialized definitions.
430.122 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT).
430.123 Effluent limitations representing the degree of effluent reduction attainable by the best conventional pollutant control technology (BCT).
430.124 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).
430.125 New source performance standards (NSPS).
430.126 Pretreatment standards for existing sources (PSES).
430.127 Pretreatment standards for new sources (PSNS).

APPENDIX A TO PART 430—METHODS 1650 AND 1653

AUTHORITY: Sections 301, 304, 306, 307, 308, 402, and 501 of the Clean Water Act, as amended, (33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361), and Section 112 of the Clean Air Act, as amended (42 U.S.C. 7412).

SOURCE: 63 FR 18635, Apr. 15, 1998, unless otherwise noted.

GENERAL PROVISIONS

§ 430.00 Applicability.

(a) This part applies to any pulp, paper, or paperboard mill that discharges or may discharge process wastewater pollutants to the waters of the United States, or that introduces or may introduce process wastewater pollutants into a publicly owned treatment works.

(b) The following table presents the subcategorization scheme codified in this part, with references to former subpart designations contained in the 1997 edition of 40 CFR parts 425 through 699:

SUBCATEGORIZATION SCHEME WITH REFERENCES TO FORMER SUBPARTS CONTAINED IN THE JULY 1, 1997 EDITION OF 40 CFR PARTS 425 THROUGH 699

Final codified subpart	Final subcategorization scheme	Types of products covered in the subpart
A	Dissolving Kraft	Dissolving pulp at kraft mills (F[a])
B	Bleached Papergrade Kraft and Soda.	Market pulp at bleached kraft mills (G[a]); paperboard, coarse paper, and tissue paper at bleached kraft mills (H[a]); pulp and fine papers at bleached kraft mills (I[a]); and pulp and paper at soda mills (P[a]).
C	Unbleached Kraft	Pulp and paper at unbleached kraft mills including linerboard or bag paper and other mixed products (A[a]); pulp and paper using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process (D[a]); and pulp and paper at combined unbleached kraft and semi-chemical mills, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system (V[a]).
D	Dissolving Sulfite	Pulp at dissolving sulfite mills for the following grades: nitration, viscose, cellophane, and acetate (K[a]).
E	Papergrade Sulfite —Calcium-, Magnesium-, or Sodium-based pulps. —Ammonium-based pulps. —Specialty grade pulps.	Pulp and paper at papergrade sulfite mills where blow pit pulp washing techniques are used (J[a]) and pulp and paper at papergrade sulfite mills where vacuum or pressure drums are used to wash pulp (U[a]).
F	Semi-Chemical	Pulp and paper at semi-chemical mills using an ammonia base or a sodium base (B[a]).
G	Mechanical Pulp	Pulp and paper at groundwood chemi-mechanical mills (L[a]); pulp and paper at groundwood mills through the application of the thermo-mechanical process (M[a]); pulp and coarse paper, molded pulp products, and newsprint at groundwood mills (N[a]); and pulp and fine paper at groundwood mills (O[a]).
H	Non-Wood Chemical Pulp	Pulp and paper at non-wood chemical pulp mills.
I	Secondary Fiber Deink	Pulp and paper at deink mills including fine papers, tissue papers, or newsprint (Q[a]).
J	Secondary Fiber Non-Deink	Paperboard from wastepaper from noncorrugating medium furnish or from corrugating medium furnish (E[a]); tissue paper from wastepaper without deinking at secondary fiber mills (T[a]); molded products from wastepaper without deinking (W[a]); and builders' paper and roofing felt from wastepaper (40 CFR part 431, subpart A [a]).

SUBCATEGORIZATION SCHEME WITH REFERENCES TO FORMER SUBPARTS CONTAINED IN THE JULY 1, 1997 EDITION OF 40 CFR PARTS 425 THROUGH 699—Continued

Final codified subpart	Final subcategorization scheme	Types of products covered in the subpart
K	Fine and Lightweight Papers from Purchased Pulp.	Fine Papers at nonintegrated mills using wood fiber furnish or cotton fiber furnish (R[a]); and lightweight papers at nonintegrated mills or lightweight electrical papers at nonintegrated mills (X[a]).
L	Tissue, Filter, Non-woven, and Paperboard from Purchased Pulp.	Tissue papers at nonintegrated mills (S[a]); filter and non-woven papers at nonintegrated mills (Y[a]); and paperboard at nonintegrated mills (Z[a]).

[a] This subpart is contained in the 40 CFR parts 425 through 699, edition revised as of July 1, 1997.

§ 430.01 General definitions.

In addition to the definitions set forth in 40 CFR part 401 and 40 CFR 403.3, the following definitions apply to this part:

(a) *Adsorbable organic halides (AOX).* A bulk parameter that measures the total mass of chlorinated organic matter in water and wastewater. The approved method of analysis for AOX is Method 1650, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm.*

(b) *Annual average.* The mean concentration, mass loading or production-normalized mass loading of a pollutant over a period of 365 consecutive days (or such other period of time determined by the permitting authority to be sufficiently long to encompass expected variability of the concentration, mass loading, or production-normalized mass loading at the relevant point of measurement).

(c) *Bleach plant.* All process equipment used for bleaching beginning with the first application of bleaching agents (e.g., chlorine, chlorine dioxide, ozone, sodium or calcium hypochlorite, or peroxide), each subsequent extraction stage, and each subsequent stage where bleaching agents are applied to the pulp. For mills in subpart E of this part producing specialty grades of pulp, the bleach plant includes process equipment used for the hydrolysis or extraction stages prior to the first application of bleaching agents. Process equipment used for oxygen delignification prior to the application of bleaching agents is not part of the bleach plant.

(d) *Bleach plant effluent.* The total discharge of process wastewaters from the bleach plant from each physical bleach line operated at the mill, comprising separate acid and alkaline filtrates or the combination thereof.

(e) *Chemical oxygen demand (COD).* A bulk parameter that measures the oxygen-consuming capacity of organic and inorganic matter present in water or wastewater. It is expressed as the amount of oxygen consumed from a chemical oxidant in a specific test.

(f) *Elemental chlorine-free (ECF).* Any process for bleaching pulps in the absence of elemental chlorine and hypochlorite that uses exclusively chlorine dioxide as the only chlorine-containing bleaching agent.

(g) *End of the pipe.* The point at which final mill effluent is discharged to waters of the United States or introduced to a POTW.

(h) *Fiber line.* A series of operations employed to convert wood or other fibrous raw material into pulp. If the final product is bleached pulp, the fiber line encompasses pulping, de-knotting, brownstock washing, pulp screening, centrifugal cleaning, and multiple bleaching and washing stages.

(i) *Minimum level (ML).* The level at which the analytical system gives recognizable signals and an acceptable calibration point. The following minimum levels apply to pollutants in this part:

Pollutant	Method	Minimum level
2,3,7,8-TCDD	1613	10 pg/L[a]
2,3,7,8-TCDF	1613	10 pg/L[a]
Trichlorosyringol	1653	2.5 ug/L[b]
3,4,5-Trichlorocatechol	1653	5.0 ug/L[b]

Pollutant	Method	Minimum level
3,4,6-Trichlorocatechol	1653	5.0 ug/L[b]
3,4,5-Trichloroguaiacol	1653	2.5 ug/L[b]
3,4,6-Trichloroguaiacol	1653	2.5 ug/L[b]
4,5,6-Trichloroguaiacol	1653	2.5 ug/L[b]
2,4,5-Trichlorophenol	1653	2.5 ug/L[b]
2,4,6-Trichlorophenol	1653	2.5 ug/L[b]
Tetrachlorocatechol	1653	5.0 ug/L[b]
Tetrachloroguaiacol	1653	5.0 ug/L[b]
2,3,4,6-Tetrachlorophenol	1653	2.5 ug/L[b]
Pentachlorophenol	1653	5.0 ug/L[b]
AOX	1650	20 ug/L[b]

[a] Picograms per liter.
[b] Micrograms per liter.

(j) *New source.* (1) Notwithstanding the criteria codified at 40 CFR 122.29(b)(1), a source subject to subpart B or E of this part is a ''new source'' if it meets the definition of ''new source'' at 40 CFR 122.2 and:

(i) It is constructed at a site at which no other source is located; or

(ii) It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source, including the total replacement of a fiber line that causes the discharge of pollutants at an existing source, except as provided in paragraph (j)(2) of this section; or

(iii) Its processes are substantially independent of an existing source at the same site. In determining whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.

(2) The following are examples of changes made by mills subject to subparts B or E of this part that alone do not cause an existing mill to become a ''new source'':

(i) Upgrades of existing pulping operations;

(ii) Upgrades or replacement of pulp screening and washing operations;

(iii) Installation of extended cooking and/or oxygen delignification systems or other post-digester, pre-bleaching delignification systems;

(iv) Bleach plant modifications including changes in methods or amounts of chemical applications, new chemical applications, installation of new bleaching towers to facilitate replacement of sodium or calcium hypochlorite, and installation of new pulp washing systems; or

(v) Total replacement of process or production equipment that causes the discharge of pollutants at an existing source (including a replacement fiber line), but only if such replacement is performed for the purpose of achieving limitations that have been included in the discharger's NPDES permit pursuant to § 430.24(b).

(k) *Non-continuous discharger.* (1) Except as provided in paragraph (k)(2) of this section, a non-continuous discharger is a mill which is prohibited by the NPDES authority from discharging pollutants during specific periods of time for reasons other than treatment plant upset control, such periods being at least 24 hours in duration. A mill shall not be deemed a non-continuous discharger unless its permit, in addition to setting forth the prohibition described above, requires compliance with the effluent limitations established for non-continuous dischargers and also requires compliance with maximum day and average of 30 consecutive days effluent limitations. Such maximum day and average of 30 consecutive days effluent limitations for non-continuous dischargers shall be established by the NPDES authority in the form of concentrations which reflect wastewater treatment levels that are representative of the application of the best practicable control technology currently available, the best conventional pollutant control technology, or new source performance standards in lieu of the maximum day and average of 30 consecutive days effluent limitations for conventional pollutants set forth in each subpart.

(2) A mill is a non-continuous discharger for the purposes of determining applicable effluent limitations under subpart B or E of this part (other than conventional limits for existing sources) if, for reasons other than treatment plant upset control (e.g., protecting receiving water quality), the mill is prohibited by the NPDES authority from discharging pollutants during specific periods of time or if it is required to release its discharge on a variable flow or pollutant loading rate basis.

(l) *POTW.* Publicly owned treatment works as defined at 40 CFR 403.3(o).

(m) *Process wastewater.* For subparts B and E only, process wastewater is any water that, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. For purposes of subparts B and E of this part, process wastewater includes boiler blowdown; wastewaters from water treatment and other utility operations; blowdowns from high rate (e.g., greater than 98 percent) recycled non-contact cooling water systems to the extent they are mixed and co-treated with other process wastewaters; wastewater, including leachates, from landfills owned by pulp and paper mills subject to subpart B or E of this part if the wastewater is commingled with wastewater from the mill's manufacturing or processing facility; and storm waters from the immediate process areas to the extent they are mixed and co-treated with other process wastewaters. For purposes of this part, contaminated groundwaters from on-site or off-site groundwater remediation projects are not process wastewater.

(n) *Production.* (1) For all limitations and standards specified in this part except those pertaining to AOX and chloroform: Production shall be defined as the annual off-the-machine production (including off-the-machine coating where applicable) divided by the number of operating days during that year. Paper and paperboard production shall be measured at the off-the-machine moisture content, except for subpart C of this part (as it pertains to pulp and paperboard production at unbleached kraft mills including linerboard or bag paper and other mixed products, and to pulp and paperboard production using the unbleached kraft neutral sulfite semi-chemical (cross recovery) process), and subparts F and J of this part (as they pertain to paperboard production from wastepaper from noncorrugating medium furnish or from corrugating medium furnish) where paper and paperboard production shall be measured in air-dry-tons (10% moisture content). Market pulp shall be measured in air-dry tons (10% moisture). Production shall be determined for each mill based upon past production practices, present trends, or committed growth.

(2) For AOX and chloroform limitations and standards specified in subparts B and E of this part: Production shall be defined as the annual unbleached pulp production entering the first stage of the bleach plant divided by the number of operating days during that year. Unbleached pulp production shall be measured in air-dried-metric-tons (10% moisture) of brownstock pulp entering the bleach plant at the stage during which chlorine or chlorine-containing compounds are first applied to the pulp. In the case of bleach plants that use totally chlorine free bleaching processes, unbleached pulp production shall be measured in air-dried-metric tons (10% moisture) of brownstock pulp entering the first stage of the bleach plant from which wastewater is discharged. Production shall be determined for each mill based upon past production practices, present trends, or committed growth.

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

(p) *TCDF.* 2,3,7,8-tetrachlorodibenzofuran.

(q) *Totally chlorine-free (TCF) bleaching.* Pulp bleaching operations that are performed without the use of chlorine, sodium hypochlorite, calcium hypochlorite, chlorine dioxide, chlorine monoxide, or any other chlorine-containing compound.

(r) *Wet Barking.* Wet barking operations shall be defined to include hydraulic barking operations and wet drum barking operations which are those drum barking operations that use substantial quantities of water in

either water sprays in the barking drums or in a partial submersion of the drums in a ''tub'' of water.

(s) TCDD. 2,3,7,8-tetrachlorodibenzo-*p*-dioxin. The approved method of analysis for TCDD is Method 1613B, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

(t) TCDF. 2,3,7,8-tetrachlorodibenzofuran. The approved method of analysis for TCDF is Method 1613B, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

(u) *Chloroform*. The approved methods of analysis for chloroform are listed in Table IC at 40 CFR 136.3.

(v) The approved method of analysis for the following chlorinated phenolic compounds is Method 1653, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*:

(1) Trichlorosyringol.
(2) 3,4,5-Trichlorocatechol.
(3) 3,4,6-Trichlorocatechol.
(4) 3,4,5-Trichloroguaiacol.
(5) 3,4,6-Trichloroguaiacol.
(6) 4,5,6-Trichloroguaiacol.
(7) 2,4,5-Trichlorophenol.
(8) 2,4,6-Trichlorophenol.
(9) Tetrachlorocatechol.
(10) Tetrachloroguaiacol.
(11) 2,3,4,6–Tetrachlorophenol.
(12) Pentachlorophenol.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998, as amended at 29834, May 18, 2012]

§ 430.02 Monitoring requirements.

This section establishes minimum monitoring frequencies for certain pollutants. Where no monitoring frequency is specified in this section or where the duration of the minimum monitoring frequency has expired under paragraphs (b) through (e) of this section, the permit writer or pretreatment control authority shall determine the appropriate monitoring frequency in accordance with 40 CFR 122.44(i) or 40 CFR part 403, as applicable.

(a) *BAT, NSPS, PSES, and PSNS monitoring frequency for chlorinated organic pollutants*. The following monitoring frequencies apply to discharges subject to subpart B or subpart E of this part:

CAS number	Pollutant	Minimum monitoring frequency	
		Non-TCF[a]	TCF[b]
1198556	Tetrachlorocatechol	Monthly	(c)
2539175	Tetrachloroguaiacol	Monthly	(c)
2539266	Trichlorosyringol	Monthly	(c)
2668248	4,5,6-trichloroguaiacol	Monthly	(c)
32139723	3,4,6-trichlorocatechol	Monthly	(c)
56961207	3,4,5-trichlorocatechol	Monthly	(c)
57057837	3,4,5-trichloroguaiacol	Monthly	(c)
58902	2,3,4,6-tetrachlorophenol	Monthly	(c)
60712449	3,4,6-trichloroguaiacol	Monthly	(c)
87865	Pentachlorophenol[d]	Monthly	(c)
88062	2,4,6-trichlorophenol[d]	Monthly	(c)
95954	2,4,5-trichlorophenol[d]	Monthly	(c)
1746016	2,3,7,8-TCDD	Monthly	(c)
51207319	2,3,7,8-TCDF	Monthly	(c)
67663	chloroform[e]	Weekly	(c)
59473040	AOX[f]	Daily	None specified.

[a] Non-TCF: Pertains to any fiber line that does not use exclusively TCF bleaching processes.
[b] TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22 or, for indirect dischargers, as reported to the pretreatment control authority under 40 CFR 403.12 (b), (d), or (e).
[c] This regulation does not specify a limit for this pollutant for TCF bleaching processes.
[d] Monitoring frequency does not apply to this compound when used as a biocide. The permitting or pretreatment control authority must determine the appropriate monitoring frequency for this compound, when used as a biocide, under 40 CFR 122.44(i) or 40 CFR part 403, as applicable.
[e] This regulation does not specify a limit for this pollutant for subpart E mills.
[f] This regulation does not specify a limit for this pollutant for the ammonium-based or specialty grade sulfite pulp segments of subpart E.

(b) *Duration of required monitoring for BAT, NSPS, PSES, and PSNS*. The monitoring frequencies specified in paragraph (a) of this section apply for the following time periods:

(1) For direct dischargers, a duration of 5 years commencing on the date the applicable limitations or standards from subpart B or subpart E of this part are first included in the discharger's NPDES permit;

(2) For existing indirect dischargers, until April 17, 2006;

(3) For new indirect dischargers, a duration of 5 years commencing on the date the indirect discharger commences operation.

(c) *Reduced monitoring frequencies for bleach plant pollutants under the Voluntary Advanced Technology Incentives Program.* The following monitoring frequencies apply to mills enrolled in the Voluntary Advanced Technology Incentives Program established under subpart B of this part for a duration of 5 years commencing after achievement of the applicable BAT limitations specified in § 430.24(b)(3) or NSPS specified in § 430.25(c)(1) for the following pollutants, except as noted in footnote f:

CAS number	Pollutant	Minimum monitoring frequency		
		Non-ECF[a]	Advanced ECF[b f]	TCF[c]
1198556	Tetrachlorocatechol	Monthly	Monthly	[d]
2539175	Tetrachloroguiacol	Monthly	Monthly	[d]
2539266	Trichlorosyringol	Monthly	Monthly	[d]
2668248	4,5,6-trichloroguaiacol	Monthly	Monthly	[d]
32139723	3,4,6-trichlorocatechol	Monthly	Monthly	[d]
56961207	3,4,5-trichlorocatechol	Monthly	Monthly	[d]
57057837	3,4,5-trichloroguaiacol	Monthly	Monthly	[d]
58902	2,3,4,6-tetrachlorophenol	Monthly	Monthly	[d]
60712449	3,4,6-trichloroguaiacol	Monthly	Monthly	[d]
87865	Pentachlorophenol[e]	Monthly	Monthly	[d]
88062	2,4,6-trichlorophenol[e]	Monthly	Monthly	[d]
95954	2,4,5-trichlorophenol[e]	Monthly	Monthly	[d]
1746016	2,3,7,8-TCDD	Monthly	Monthly	[d]
51207319	2,3,7,8-TCDF	Monthly	Monthly	[d]
67663	Chloroform	Weekly	Monthly	[d]

[a] Non-ECF: Pertains to any fiber line that does not use exclusively ECF or TCF bleaching processes.

[b] Advanced ECF: Pertains to any fiber line that uses exclusively Advanced ECF bleaching processes, or exclusively ECF and TCF bleaching processes as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22. Advanced ECF consists of the use of extended delignification or other technologies that achieve at least the Tier I performance levels specified in § 430.24(b)(4)(i).

[c] TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.

[d] This regulation does not specify a limit for this pollutant for TCF bleaching processes.

[e] Monitoring frequency does not apply to this compound when used as a biocide. The permitting authority must determine the appropriate monitoring frequency for this compound, when used as a biocide, under 40 CFR 122.44(i).

[f] Monitoring requirements for these pollutants by mills certifying as Advanced ECF in their NPDES permit application or other communication to the permitting authority will be suspended after one year of monitoring. The permitting authority must determine the appropriate monitoring frequency for these pollutants beyond that time under 40 CFR 122.44(i).

(d) *Reduced monitoring frequencies for AOX under the Voluntary Advanced Technology Incentives Program (year one).* The following monitoring frequencies apply to direct dischargers enrolled in the Voluntary Advanced Technology Incentives Program established under subpart B of this part for a duration of one year after achievement of the applicable BAT limitations specified in § 430.24(b)(4)(i) or NSPS specified in § 430.25(c)(2):

CAS number	Pollutant	Non-ECF, any tier[a]	Advanced ECF, any tier[b]	TCF, any tier[c]
59473040	AOX	Daily	Weekly	None specified.

[a] Non-ECF: Pertains to any fiber line that does not use exclusively ECF or TCF bleaching processes.

[b] Advanced ECF: Pertains to any fiber line that uses exclusively Advanced ECF bleaching processes or exclusively ECF and TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22. Advanced ECF consists of the use of extended delignification or other technologies that achieve at least the Tier I performance levels specified in § 430.24(b)(4)(i).

[c] TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.

(e) *Reduced monitoring frequencies for AOX under the Voluntary Advanced Technology Incentives Program (years*

two through five). The following monitoring frequencies apply to mills enrolled in the Voluntary Advanced Technology Incentives Program established under subpart B of this part for a duration of four years starting one year after achievement of the applicable BAT limitations specified in § 430.24(b)(4)(i) or NSPS specified in § 430.25(c)(2):

CAS number	Pollutant	Non-ECF any tier[a]	Advanced ECF—tier I[b]	Advanced ECF—tier II[b]	Advanced ECF—tier III[b]	TCF—any tier[c]
59473040	AOX	Daily	Monthly	Quarterly	Annually	None specified.

[a] Non-ECF: Pertains to any fiber line that does not use exclusively ECF or TCF bleaching processes.
[b] Advanced ECF: Pertains to any fiber line that uses exclusively Advanced ECF bleaching processes or exclusively ECF and TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22. Advanced ECF consists of the use of extended delignification or other technologies that achieve at least the Tier I performance levels specified in § 430.24(b)(4)(i).
[c] TCF: Pertains to any fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.

(f) *Certification in Lieu of Monitoring for Chloroform*—(1) *Under what circumstances may a discharger be exempt from the minimum monitoring requirements of this section for chloroform?* A discharger subject to limitations or standards for chloroform under subpart B of this part is not subject to the minimum monitoring requirements specified in this section for chloroform at a fiber line to which the limitations or standards apply if the discharger meets the requirements of this section.

(2) *How do I qualify for the exemption?* At the time you request an exemption from the minimum monitoring requirements of this section for chloroform from your permitting authority or pretreatment control authority for a fiber line, you must:

(i) Demonstrate, based on 104 measurements taken over a period of not less than two years of monitoring conducted in accordance with paragraph (a) of this section, that you are complying with the applicable limitations or standards for chloroform;

(ii) Certify that you will maintain a record of the maximum value for each of the following process and operating conditions for the fiber line that was recorded during the collection of each of the samples used to make the demonstration required under paragraph (f)(2)(i) of this section.

(A) The pH of the first chlorine dioxide bleaching stage;

(B) The chlorine (Cl_2) content of chlorine dioxide (ClO_2) used on the bleach line;

(C) The kappa factor of the first chlorine dioxide bleaching stage; and

(D) The total bleach line chlorine dioxide application rate;

(iii) Identify the chlorine-containing compound used for bleaching during the collection of samples used to make the demonstration required under paragraph (f)(2)(i) of this section; and

(iv) Certify that the fiber line does not use either elemental chlorine or hypochlorite as bleaching agents.

(3) *What happens if I change the process and operating conditions on the fiber line so that one or more exceeds the maximum value recorded under paragraph (f)(2)(ii) of this section for that process and operating condition?* If you wish to continue your exemption from the minimum monitoring requirements of this section for chloroform, you must:

(i) Demonstrate, based on monitoring conducted at a frequency similar to that required in paragraph (a) of this section and for a duration determined by the permitting or pretreatment control authority, that you are complying with the applicable limitations or standards for chloroform;

(ii) Certify that you will maintain a record of the maximum value for each of the following process and operating conditions for the fiber line that was recorded during the collection of each of the samples used to make the demonstration required under paragraph (f)(6)(i) of this section:

(A) The pH of the first chlorine dioxide bleaching stage;

(B) The chlorine (Cl_2) content of chlorine dioxide (ClO_2) used on the bleach line;

(C) The kappa factor of the first chlorine dioxide bleaching stage; and

(D) The total bleach line chlorine dioxide application rate;

(iii) Identify the chlorine-containing compound used for bleaching during the collection of each sample used to make the demonstration required under paragraph (f)(3)(i) of this section; and

(iv) Certify that the fiber line does not use either elemental chlorine or hypochlorite as bleaching agents.

(4) *What are my reporting obligations?* You must certify in reports required under §122.41(l)(4) or §403.12(b) of this chapter, as appropriate, that the chlorine-containing compounds used for bleaching are unchanged from those identified under paragraph (f)(2)(iii) of this section and that the following process and operating conditions maintained on the fiber line during the reporting period have not exceeded the maximum value recorded for each such condition during the collection of the samples used to make the demonstration required under paragraphs (f)(2)(i) or (f)(3)(i) of this section:

(i) The pH of the first chlorine dioxide bleaching stage;

(ii) The chlorine (Cl_2) content of chlorine dioxide (ClO_2) used on the bleach line;

(iii) The kappa factor of the first chlorine dioxide bleaching stage; and

(iv) The total bleach line chlorine dioxide application rate.

(5) *What happens if I fail to maintain the records described in paragraphs (f)(2)(ii) and (f)(3)(ii) of this section?* You will be required to comply with the minimum monitoring requirements of this section for chloroform.

(6) *What happens if I exceed the maximum value recorded under paragraphs (f)(2)(ii) or (f)(3)(ii) of this section for any of the process and operating conditions identified in that section?*

(i) If for any reason (e.g., intentionally or due to process upset) you fail to maintain process and operating conditions at values equal to or less than the maximum value recorded under paragraphs (f)(2)(ii) or (f)(3)(ii) of this section for each such condition, you will be in violation of the applicable chloroform limitation or standard unless:

(A) Within 30 days, you notify your permitting or pretreatment control authority in writing of the exceedance; and

(B) You demonstrate compliance with the applicable chloroform limitation or standard by immediately monitoring the bleach plant effluent for chloroform at a frequency similar to that required in paragraph (a) of this section and for a duration determined by the permit or pretreatment control authority.

(ii) In order to continue your exemption from the minimum monitoring requirements of this section for chloroform, you must meet the requirements of paragraph (f)(6)(i) of this section and you must recertify that the fiber line process and operating conditions do not exceed the maximum value recorded under paragraphs (f)(2)(ii) or (f)(3)(ii) of this section for each of the parameters identified in those paragraphs.

(7) *Definitions:*

(i) *Kappa factor*—the ratio of available chlorine (total equivalent chlorine, as percent on oven dry pulp) to the kappa number of the pulp. Kappa number is the lignin content of pulp, as measured by a modified permanganate test corrected to 50 percent consumption of the chemical.

(ii) *Total bleach line chlorine dioxide application rate*—mass of chlorine dioxide applied in all stages of the bleach line per mass of unbleached pulp (*i.e.*, lb/ton or kg/kkg).

(iii) *Chlorine-containing compounds*—compounds containing chlorine used in the bleach plant for bleaching, brightening, whitening, or viscosity control. These compounds include but are not limited to chlorine (Cl_2), sodium hypochlorite (NaOCl), chlorine dioxide (ClO_2) and chlorine monoxide (Cl_2O).

(g) Analyst may use NCASI Method CP–86.07, ''Chlorinated Phenolics in Water by *In situ* Acetylation and GC/MS Determination'' (January 2002) for determination of certain chlorinated phenols, chlorinated guaiacols, chlorinated catechols, chlorinated benzaldehydes (*i.e.*, vanillins and syringaldehydes), and trichlorsyringol (analytes specified in the method) in bleach plant filtrate as an alternative to EPA Method 1653. NCASI Method CP–86.07 is available from the Publications Coordinator, NCASI, P.O. Box

13318, Research Triangle Park, NC 27709–3318. Telephone: 919–588–1987.

[63 FR 18635, Apr. 15, 1998, as amended at 67 FR 58997, Sept. 19, 2002; 72 FR 11248, Mar. 12, 2007]

§ 430.03 Best management practices (BMPs) for spent pulping liquor, soap, and turpentine management, spill prevention, and control.

(a) *Applicability*. This section applies to direct and indirect discharging pulp, paper, and paperboard mills with pulp production in subparts B (Bleached Papergrade Kraft and Soda) and E (Papergrade Sulfite).

(b) *Specialized definitions*—(1) *Action Level:* A daily pollutant loading that when exceeded triggers investigative or corrective action. Mills determine action levels by a statistical analysis of six months of daily measurements collected at the mill. For example, the lower action level may be the 75th percentile of the running seven-day averages (that value exceeded by 25 percent of the running seven-day averages) and the upper action level may be the 90th percentile of the running seven-day averages (that value exceeded by 10 percent of the running seven-day averages).

(2) *Equipment Items in Spent Pulping Liquor, Soap, and Turpentine Service:* Any process vessel, storage tank, pumping system, evaporator, heat exchanger, recovery furnace or boiler, pipeline, valve, fitting, or other device that contains, processes, transports, or comes into contact with spent pulping liquor, soap, or turpentine. Sometimes referred to as ''equipment items.''

(3) *Immediate Process Area:* The location at the mill where pulping, screening, knotting, pulp washing, pulping liquor concentration, pulping liquor processing, and chemical recovery facilities are located, generally the battery limits of the aforementioned processes. ''Immediate process area'' includes spent pulping liquor storage and spill control tanks located at the mill, whether or not they are located in the immediate process area.

(4) *Intentional Diversion:* The planned removal of spent pulping liquor, soap, or turpentine from equipment items in spent pulping liquor, soap, or turpentine service by the mill for any purpose including, but not limited to, maintenance, grade changes, or process shutdowns.

(5) *Mill:* The owner or operator of a direct or indirect discharging pulp, paper, or paperboard manufacturing facility subject to this section.

(6) *Senior Technical Manager:* The person designated by the mill manager to review the BMP Plan. The senior technical manager shall be the chief engineer at the mill, the manager of pulping and chemical recovery operations, or other such responsible person designated by the mill manager who has knowledge of and responsibility for pulping and chemical recovery operations.

(7) *Soap:* The product of reaction between the alkali in kraft pulping liquor and fatty acid portions of the wood, which precipitate out when water is evaporated from the spent pulping liquor.

(8) *Spent Pulping Liquor:* For kraft and soda mills ''spent pulping liquor'' means black liquor that is used, generated, stored, or processed at any point in the pulping and chemical recovery processes. For sulfite mills ''spent pulping liquor'' means any intermediate, final, or used chemical solution that is used, generated, stored, or processed at any point in the sulfite pulping and chemical recovery processes (e.g., ammonium-, calcium-, magnesium-, or sodium-based sulfite liquors).

(9) *Turpentine:* A mixture of terpenes, principally pinene, obtained by the steam distillation of pine gum recovered from the condensation of digester relief gases from the cooking of softwoods by the kraft pulping process. Sometimes referred to as sulfate turpentine.

(c) *Requirement to implement Best Management Practices*. Each mill subject to this section must implement the Best Management Practices (BMPs) specified in paragraphs (c)(1) through (10) of this section. The primary objective of the BMPs is to prevent leaks and spills of spent pulping liquors, soap, and turpentine. The secondary objective is to contain, collect, and recover at the immediate process area, or otherwise control, those leaks, spills, and intentional diversions of spent pulping liquor,

soap, and turpentine that do occur. BMPs must be developed according to best engineering practices and must be implemented in a manner that takes into account the specific circumstances at each mill. The BMPs are as follows:

(1) The mill must return spilled or diverted spent pulping liquors, soap, and turpentine to the process to the maximum extent practicable as determined by the mill, recover such materials outside the process, or discharge spilled or diverted material at a rate that does not disrupt the receiving wastewater treatment system.

(2) The mill must establish a program to identify and repair leaking equipment items. This program must include:

(i) Regular visual inspections (e.g., once per day) of process areas with equipment items in spent pulping liquor, soap, and turpentine service;

(ii) Immediate repairs of leaking equipment items, when possible. Leaking equipment items that cannot be repaired during normal operations must be identified, temporary means for mitigating the leaks must be provided, and the leaking equipment items repaired during the next maintenance outage;

(iii) Identification of conditions under which production will be curtailed or halted to repair leaking equipment items or to prevent pulping liquor, soap, and turpentine leaks and spills; and

(iv) A means for tracking repairs over time to identify those equipment items where upgrade or replacement may be warranted based on frequency and severity of leaks, spills, or failures.

(3) The mill must operate continuous, automatic monitoring systems that the mill determines are necessary to detect and control leaks, spills, and intentional diversions of spent pulping liquor, soap, and turpentine. These monitoring systems should be integrated with the mill process control system and may include, e.g., high level monitors and alarms on storage tanks; process area conductivity (or pH) monitors and alarms; and process area sewer, process wastewater, and wastewater treatment plant conductivity (or pH) monitors and alarms.

(4) The mill must establish a program of initial and refresher training of operators, maintenance personnel, and other technical and supervisory personnel who have responsibility for operating, maintaining, or supervising the operation and maintenance of equipment items in spent pulping liquor, soap, and turpentine service. The refresher training must be conducted at least annually and the training program must be documented.

(5) The mill must prepare a brief report that evaluates each spill of spent pulping liquor, soap, or turpentine that is not contained at the immediate process area and any intentional diversion of spent pulping liquor, soap, or turpentine that is not contained at the immediate process area. The report must describe the equipment items involved, the circumstances leading to the incident, the effectiveness of the corrective actions taken to contain and recover the spill or intentional diversion, and plans to develop changes to equipment and operating and maintenance practices as necessary to prevent recurrence. Discussion of the reports must be included as part of the annual refresher training.

(6) The mill must establish a program to review any planned modifications to the pulping and chemical recovery facilities and any construction activities in the pulping and chemical recovery areas before these activities commence. The purpose of such review is to prevent leaks and spills of spent pulping liquor, soap, and turpentine during the planned modifications, and to ensure that construction and supervisory personnel are aware of possible liquor diversions and of the requirement to prevent leaks and spills of spent pulping liquors, soap, and turpentine during construction.

(7) The mill must install and maintain secondary containment (*i.e.*, containment constructed of materials impervious to pulping liquors) for spent pulping liquor bulk storage tanks equivalent to the volume of the largest tank plus sufficient freeboard for precipitation. An annual tank integrity testing program, if coupled with other containment or diversion structures,

may be substituted for secondary containment for spent pulping liquor bulk storage tanks.

(8) The mill must install and maintain secondary containment for turpentine bulk storage tanks.

(9) The mill must install and maintain curbing, diking or other means of isolating soap and turpentine processing and loading areas from the wastewater treatment facilities.

(10) The mill must conduct wastewater monitoring to detect leaks and spills, to track the effectiveness of the BMPs, and to detect trends in spent pulping liquor losses. Such monitoring must be performed in accordance with paragraph (i) of this section.

(d) *Requirement to develop a BMP Plan*. (1) Each mill subject to this section must prepare and implement a BMP Plan. The BMP Plan must be based on a detailed engineering review as described in paragraphs (d)(2) and (3) of this section. The BMP Plan must specify the procedures and the practices required for each mill to meet the requirements of paragraph (c) of this section, the construction the mill determines is necessary to meet those requirements including a schedule for such construction, and the monitoring program (including the statistically derived action levels) that will be used to meet the requirements of paragraph (i) of this section. The BMP Plan also must specify the period of time that the mill determines the action levels established under paragraph (h) of this section may be exceeded without triggering the responses specified in paragraph (i) of this section.

(2) Each mill subject to this section must conduct a detailed engineering review of the pulping and chemical recovery operations—including but not limited to process equipment, storage tanks, pipelines and pumping systems, loading and unloading facilities, and other appurtenant pulping and chemical recovery equipment items in spent pulping liquor, soap, and turpentine service—for the purpose of determining the magnitude and routing of potential leaks, spills, and intentional diversions of spent pulping liquors, soap, and turpentine during the following periods of operation:

(i) Process start-ups and shut downs;

(ii) Maintenance;

(iii) Production grade changes;

(iv) Storm or other weather events;

(v) Power failures; and

(vi) Normal operations.

(3) As part of the engineering review, the mill must determine whether existing spent pulping liquor containment facilities are of adequate capacity for collection and storage of anticipated intentional liquor diversions with sufficient contingency for collection and containment of spills. The engineering review must also consider:

(i) The need for continuous, automatic monitoring systems to detect and control leaks and spills of spent pulping liquor, soap, and turpentine;

(ii) The need for process wastewater diversion facilities to protect end-of-pipe wastewater treatment facilities from adverse effects of spills and diversions of spent pulping liquors, soap, and turpentine;

(iii) The potential for contamination of storm water from the immediate process areas; and

(iv) The extent to which segregation and/or collection and treatment of contaminated storm water from the immediate process areas is appropriate.

(e) *Amendment of BMP Plan*. (1) Each mill subject to this section must amend its BMP Plan whenever there is a change in mill design, construction, operation, or maintenance that materially affects the potential for leaks or spills of spent pulping liquor, turpentine, or soap from the immediate process areas.

(2) Each mill subject to this section must complete a review and evaluation of the BMP Plan five years after the first BMP Plan is prepared and, except as provided in paragraph (e)(1) of this section, once every five years thereafter. As a result of this review and evaluation, the mill must amend the BMP Plan within three months of the review if the mill determines that any new or modified management practices and engineered controls are necessary to reduce significantly the likelihood of spent pulping liquor, soap, and turpentine leaks, spills, or intentional diversions from the immediate process areas, including a schedule for implementation of such practices and controls.

(f) *Review and certification of BMP Plan.* The BMP Plan, and any amendments thereto, must be reviewed by the senior technical manager at the mill and approved and signed by the mill manager. Any person signing the BMP Plan or its amendments must certify to the permitting or pretreatment control authority under penalty of law that the BMP Plan (or its amendments) has been prepared in accordance with good engineering practices and in accordance with this regulation. The mill is not required to obtain approval from the permitting or pretreatment control authority of the BMP Plan or any amendments thereto.

(g) *Record keeping requirements.* (1) Each mill subject to this section must maintain on its premises a complete copy of the current BMP Plan and the records specified in paragraph (g)(2) of this section and must make such BMP Plan and records available to the permitting or pretreatment control authority and the Regional Administrator or his or her designee for review upon request.

(2) The mill must maintain the following records for 3 years from the date they are created:

(i) Records tracking the repairs performed in accordance with the repair program described in paragraph (c)(2) of this section;

(ii) Records of initial and refresher training conducted in accordance with paragraph (c)(4) of this section;

(iii) Reports prepared in accordance with paragraph (c)(5) of this section; and

(iv) Records of monitoring required by paragraphs (c)(10) and (i) of this section.

(h) *Establishment of wastewater treatment system influent action levels.* (1) Each mill subject to this section must conduct a monitoring program, described in paragraph (h)(2) of this section, for the purpose of defining wastewater treatment system influent characteristics (or action levels), described in paragraph (h)(3) of this section, that will trigger requirements to initiate investigations on BMP effectiveness and to take corrective action.

(2) Each mill subject to this section must employ the following procedures in order to develop the action levels required by paragraph (h) of this section:

(i) *Monitoring parameters.* The mill must collect 24-hour composite samples and analyze the samples for a measure of organic content (e.g., Chemical Oxygen Demand (COD) or Total Organic Carbon (TOC)). Alternatively, the mill may use a measure related to spent pulping liquor losses measured continuously and averaged over 24 hours (e.g., specific conductivity or color).

(ii) *Monitoring locations.* For direct dischargers, monitoring must be conducted at the point influent enters the wastewater treatment system. For indirect dischargers monitoring must be conducted at the point of discharge to the POTW. For the purposes of this requirement, the mill may select alternate monitoring point(s) in order to isolate possible sources of spent pulping liquor, soap, or turpentine from other possible sources of organic wastewaters that are tributary to the wastewater treatment facilities (e.g., bleach plants, paper machines and secondary fiber operations).

(3) By the date prescribed in paragraph (j)(1)(iii) of this section, each existing discharger subject to this section must complete an initial six-month monitoring program using the procedures specified in paragraph (h)(2) of this section and must establish initial action levels based on the results of that program. A wastewater treatment influent action level is a statistically determined pollutant loading determined by a statistical analysis of six months of daily measurements. The action levels must consist of a lower action level, which if exceeded will trigger the investigation requirements described in paragraph (i) of this section, and an upper action level, which if exceeded will trigger the corrective action requirements described in paragraph (i) of this section.

(4) By the date prescribed in paragraph (j)(1)(vi) of this section, each existing discharger must complete a second six-month monitoring program using the procedures specified in paragraph (h)(2) of this section and must establish revised action levels based on the results of that program. The initial

action levels shall remain in effect until replaced by revised action levels.

(5) By the date prescribed in paragraph (j)(2) of this section, each new source subject to this section must complete a six-month monitoring program using the procedures specified in paragraph (h)(2) of this section and must develop a lower action level and an upper action level based on the results of that program.

(6) Action levels developed under this paragraph must be revised using six months of monitoring data after any change in mill design, construction, operation, or maintenance that materially affects the potential for leaks or spills of spent pulping liquor, soap, or turpentine from the immediate process areas.

(i) *Monitoring, corrective action, and reporting requirements.* (1) Each mill subject to this section must conduct daily monitoring of the influent to the wastewater treatment system in accordance with the procedures described in paragraph (h)(2) of this section for the purpose of detecting leaks and spills, tracking the effectiveness of the BMPs, and detecting trends in spent pulping liquor losses.

(2) Whenever monitoring results exceed the lower action level for the period of time specified in the BMP Plan, the mill must conduct an investigation to determine the cause of such exceedance. Whenever monitoring results exceed the upper action level for the period of time specified in the BMP Plan, the mill must complete corrective action to bring the wastewater treatment system influent mass loading below the lower action level as soon as practicable.

(3) Although exceedances of the action levels will not constitute violations of an NPDES permit or pretreatment standard, failure to take the actions required by paragraph (i)(2) of this section as soon as practicable will be a permit or pretreatment standard violation.

(4) Each mill subject to this section must report to the NPDES permitting or pretreatment control authority the results of the daily monitoring conducted pursuant to paragraph (i)(1) of this section. Such reports must include a summary of the monitoring results, the number and dates of exceedances of the applicable action levels, and brief descriptions of any corrective actions taken to respond to such exceedances. Submission of such reports shall be at the frequency established by the NPDES permitting or pretreatment control authority, but in no case less than once per year.

(j) *Compliance deadlines*—(1) *Existing direct and indirect dischargers.* Except as provided in paragraph (j)(2) of this section for new sources, indirect discharging mills subject to this section must meet the deadlines set forth below. Except as provided in paragraph (j)(2) of this section for new sources, NPDES permits must require direct discharging mills subject to this section to meet the deadlines set forth below. If a deadline set forth below has passed at the time the NPDES permit containing the BMP requirement is issued, the NPDES permit must require immediate compliance with such BMP requirement(s).

(i) Prepare BMP Plans and certify to the permitting or pretreatment authority that the BMP Plan has been prepared in accordance with this regulation not later than April 15, 1999;

(ii) Implement all BMPs specified in paragraph (c) of this section that do not require the construction of containment or diversion structures or the installation of monitoring and alarm systems not later than April 15, 1999.

(iii) Establish initial action levels required by paragraph (h)(3) of this section not later than April 15, 1999.

(iv) Commence operation of any new or upgraded continuous, automatic monitoring systems that the mill determines to be necessary under paragraph (c)(3) of this section (other than those associated with construction of containment or diversion structures) not later than April 17, 2000.

(v) Complete construction and commence operation of any spent pulping liquor, collection, containment, diversion, or other facilities, including any associated continuous monitoring systems, necessary to fully implement BMPs specified in paragraph (c) of this section not later than April 16, 2001.

(vi) Establish revised action levels required by paragraph (h)(4) of this section as soon as possible after fully implementing the BMPs specified in paragraph (c) of this section, but not later than January 15, 2002.

(2) *New sources.* Upon commencing discharge, new sources subject to this section must implement all of the BMPs specified in paragraph (c) of this section, prepare the BMP Plan required by paragraph (d) of this section, and certify to the permitting or pretreatment authority that the BMP Plan has been prepared in accordance with this regulation as required by paragraph (f) of this section, except that the action levels required by paragraph (h)(5) of this section must be established not later than 12 months after commencement of discharge, based on six months of monitoring data obtained prior to that date in accordance with the procedures specified in paragraph (h)(2) of this section.

(k) The provisions of paragraphs (c) through (j) of this section do not apply to the bleached papergrade kraft mill, commonly known as the Androscoggin Mill, that is owned by International Paper and located in Jay, Maine. In lieu of imposing the requirements specified in those paragraphs, the permitting authority shall establish conditions for the discharge of COD and color for this mill on the basis of best professional judgment.

[63 FR 18635, Apr. 15, 1998, as amended at 65 FR 46108, July 27, 2000]

Subpart A—Dissolving Kraft Subcategory

§ 430.10 Applicability; description of the dissolving kraft subcategory.

The provisions of this subpart apply to discharges resulting from the production of dissolving pulp at kraft mills.

§ 430.11 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

§ 430.12 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART A

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	23.6	12.25	6.88
TSS	37.3	20.05	11.02
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject

to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to annual average effluent limitations:

SUBPART A

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.2	1.7	0.95
TSS	6.9	3.75	2.0
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to the annual average effluent limitations:

SUBPART A

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.35	0.2	0.1
TSS	0.70	0.4	0.2
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to the annual average effluent limitations:

SUBPART A

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.6	0.35	0.2
TSS	1.45	0.8	0.4
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.12 of this subpart for the best practicable control technology currently available (BPT).

§ 430.14 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb) but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART A

[BAT effluent limitations]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0025	(0.011)(55.1)/y
Trichlorophenol	0.016	(0.068)(55.1)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.15 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS,

but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART A
[NSPS]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	15.6	8.4	4.4
TSS	27.3	14.3	7.5
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0025	(0.012)(50.7)/y
Trichlorophenol	0.016	(0.074)(50.7)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.16 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART A
[PSES]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.011)(55.1)/y	0.0025
Trichlorophenol	(0.082)(55.1)/y	0.019
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

§ 430.17 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART A
[PSNS]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.012)(50.7)/y	0.0025
Trichlorophenol	(0.089)(50.7)/y	0.019
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Subpart B—Bleached Papergrade Kraft and Soda Subcategory

§ 430.20 Applicability; description of the bleached papergrade kraft and soda subcategory.

The provisions of this subpart apply to discharges resulting from: The production of market pulp at bleached kraft mills; the integrated production of paperboard, coarse paper, and tissue paper at bleached kraft mills; the integrated production of pulp and fine papers at bleached kraft mills; and the integrated production of pulp and paper at soda mills.

§ 430.21 Specialized definitions.

(a) The general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part apply to this subpart.

(b) *Baseline BAT limitations or NSPS* means the BAT limitations specified in § 430.24(a) (1) or (2), as applicable, and the NSPS specified in § 430.25(b) (1) or (2), as applicable, that apply to any direct discharger that is not ''enrolled'' in the ''Voluntary Advanced Technology Incentives Program.''

(c) *Enroll* means to notify the permitting authority that a mill intends to participate in the ''Voluntary Advanced Technology Incentives Program.'' A mill can enroll by indicating its intention to participate in the program either as part of its application for a National Pollutant Discharge Elimination System (NPDES) permit, or through separate correspondence to the permitting authority as long as the mill signs the correspondence in accordance with 40 CFR 122.22.

(d) *Existing effluent quality* means the level at which the pollutants identified in § 430.24(a)(1) are present in the effluent of a mill ''enrolled'' in the ''Voluntary Advanced Technology Incentives Program.''

(e) *Kappa number* is a measure of the lignin content in unbleached pulp, determined after pulping and prior to bleaching.

(f) *Voluntary Advanced Technology Incentives Program* is the program established under § 430.24(b) (for existing direct dischargers) and § 430.25(c) (for new direct dischargers) whereby participating mills agree to accept enforceable effluent limitations and conditions in their NPDES permits that are more stringent than the ''baseline BAT limitations or NSPS'' that would otherwise apply, in exchange for regulatory- and enforcement-related rewards and incentives.

§ 430.22 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	15.45	8.05	4.52
TSS	30.4	16.4	9.01
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.65	7.1	3.99
TSS	24.0	12.9	7.09
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	10.6	5.5	3.09
TSS	22.15	11.9	6.54
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for soda facilities where pulp and paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.7	7.1	3.99
TSS	24.5	13.2	7.25
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations:

SUBPART B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.3	1.2	0.70
TSS	5.3	2.85	1.55
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.25	1.2	0.65
TSS	5.75	3.1	1.70
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.95	1.0	0.55
TSS	5.3	2.85	1.55
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for soda facilities where pulp and papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.05	1.1	0.60
TSS	5.25	2.8	1.55
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations:

SUBPART B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.2	0.1	0.1
TSS	0.6	0.3	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.25	0.15	0.05
TSS	0.65	0.35	0.20
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.2	0.1	0.05
TSS	0.55	0.3	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for soda facilities where pulp and papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.1	0.05
TSS	0.5	0.25	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations:

SUBPART B

[BPT effluent limitations for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.4	0.2	0.15
TSS	1.15	0.6	0.35
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.45	0.25	0.10
TSS	1.25	0.7	0.35
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for bleached kraft facilities where pulp and fine papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.35	0.2	0.10
TSS	1.15	0.6	0.30
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[BPT effluent limitations for soda facilities where pulp and papers are produced]

Pollutant or pollutant parameter	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.3	0.2	0.10
TSS	1.1	0.55	0.35
pH	(1)	(1)	(1)

1Within the range of 5.0 to 9.0 at all times.

§ 430.23 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). The limitations shall be the same as those specified in § 430.22 of this subpart for the best practicable control technology currently available (BPT).

§ 430.24 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) Except as provided in paragraph (b) of this section—

(1) The following effluent limitations apply with respect to each fiber line that does not use an exclusively TCF bleaching process, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART B

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	[b]
TCDF	31.9[c]	[b]
Chloroform	6.92[d]	4.14[d]
Trichlorosyringol	<ML[a]	[b]
3,4,5-trichlorocatechol	<ML[a]	[b]
3,4,6-trichlorocatechol	<ML[a]	[b]
3,4,5-trichloroguaiacol	<ML[a]	[b]
3,4,6-trichloroguaiacol	<ML[a]	[b]
4,5,6-trichloroguaiacol	<ML[a]	[b]
2,4,5-trichlorophenol	<ML[a]	[b]
2,4,6-trichlorophenol	<ML[a]	[b]
Tetrachlorocatechol	<ML[a]	[b]
Tetrachloroguaiacol	<ML[a]	[b]
2,3,4,6-tetrachlorophenol	<ML[a]	[b]
Pentachlorophenol	<ML[a]	[b]

	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day (kg/kkg)	Monthly average (kg/kkg)	Annual average (kg/kkg)
AOX	0.951	0.623	0.512
COD	[e]	[e]	[e]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] Picograms per liter.
[d] Grams per 1,000 kilograms (g/kkg).
[e] [Reserved]

(2) The following effluent limitations apply with respect to each fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART B

Pollutant or pollutant property	BAT effluent limitations (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML[a]	[b]	<ML[a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(b) The following limitations apply with respect to each fiber line enrolled in the Voluntary Advanced Technology Incentives Program:

(1) Stage 1 Limitations: Numeric limitations that are equivalent to the discharger's existing effluent quality or the discharger's current effluent limitations established under CWA section 301(b)(2), whichever are more stringent, for the pollutants identified in paragraph (a)(1) of this section (with the exception of COD). For AOX, the permitting authority must determine existing effluent quality for each fiber line enrolled in the Voluntary Advanced Technology Incentives Program at the end of the pipe based on loadings attributable to that fiber line. For the remaining pollutants, with the exception of COD, the permitting authority must determine existing effluent quality for each fiber line enrolled in the Voluntary Advanced Technology Incentives Program at the point where the wastewater containing those pollutants leaves the bleach plant. These limitations must be recalculated each time the NPDES permit of a discharger enrolled in the Voluntary Advanced Technology Incentives Program is reissued, up to:

(i) April 15, 2004 for all pollutants in paragraph (a)(1) of this section except AOX; and

(ii) The date specified in paragraph (b)(4)(ii) of this section for achieving the applicable AOX limitation specified in paragraph (b)(4)(i).

(2) Best Professional Judgment Milestones: Narrative or numeric limitations and/or special permit conditions, as appropriate, established by the permitting authority on the basis of his or her best professional judgment that reflect reasonable interim milestones toward achievement of the effluent limitations specified in paragraphs (b)(3) and (b)(4) of this section, as applicable, after consideration of the Milestones Plan submitted by the discharger in accordance with paragraph (c) of this section.

(3) Six-year Milestones: By April 15, 2004 all dischargers enrolled in the Voluntary Advanced Technology Incentives Program must achieve the following:

(i) The effluent limitations specified in paragraph (a)(1) of this section, except that, with respect to AOX, dischargers subject to Tier I effluent limitations specified in paragraph (b)(4)(i) of this section must achieve the AOX limitation specified in that paragraph; or

(ii) For dischargers that use exclusively TCF bleaching processes as of April 15, 2004, the effluent limitations specified in paragraph (a)(2) of this section.

(4)(i) Stage 2 Limitations:

ULTIMATE VOLUNTARY ADVANCED TECHNOLOGY INCENTIVES PROGRAM BAT LIMITATIONS

Tier	Kappa number (annual average)	Filtrate recycling	Total pulping area condensate, evaporator condensate, and bleach plant wastewater flow (annual average)	AOX (kg/kkg)			
				Non-TCF[a]		TCF	
				Maximum for any 1 day	Annual average	Maximum for any 1 day	Annual average
Tier I ...	20 (softwood furnish) ... 13 (Hardwood furnish)	[b]	N/A	0.58	0.26	<ML[c]	[d]
Tier II ..	NA	[b]	10 cubic meters/kkg	0.23	0.10	<ML[c]	[d]
Tier III	N/A	[b]	5 cubic meters/kkg	0.11	0.05	<ML[c]	[d]

[a] Non-TCF: Pertains to any fiber line that does not use exclusively TCF bleaching processes.
[b] Complete recycling to the chemical recovery system of all filtrates generated prior to bleaching. Under Tier I, this includes all filtrates up to the point where kappa number is measured.
[c] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[d] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
N/A means "not applicable."

(ii) Deadlines.

(A) A discharger enrolled in Tier I of the Voluntary Advanced Technology Incentives Program must achieve the Tier I limitations in paragraph (b)(4)(i) of this section by April 15, 2004.

(B) A discharger enrolled in Tier II of the Voluntary Advanced Technology Incentives Program must achieve the Tier II limitations in paragraph (b)(4)(i) of this section by April 15, 2009.

(C) A discharger enrolled in Tier III of the Voluntary Advanced Technology Incentives Program must achieve the Tier III limitations in paragraph (b)(4)(i) of this section by April 15, 2014.

(c) All dischargers enrolled or intending to enroll in the Voluntary Advanced Technology Incentives Program must submit to the NPDES permitting authority a Milestones Plan covering all fiber lines enrolled or intended to be enrolled in that program at their mill by October 5, 1999 or the date the discharger applies for an NPDES permit containing limitations and conditions based on paragraph (b) of this section, whichever is later. Mills may claim all or part of the Milestones Plan as confidential business information (CBI) in accordance with 40 CFR part 2 and 40 CFR 122.7. If a mill claims all or part of the plan as CBI, the mill must prepare and submit to the NPDES permitting authority a summary of the plan for public release. The Milestones Plan must include the following information:

(1) A description of each anticipated new technology component or process modification that the discharger intends to implement in order to achieve the limitations in paragraphs (b)(3) and (b)(4) of this section;

(2) A master schedule showing the sequence of implementing the new technology components or process modifications and identifying critical path relationships within the sequence;

(3) A schedule for each individual new technology component or process modification that includes:

(i) The anticipated initiation and completion dates of construction, installation and operational ''shakedown'' period associated with the technology components or process modifications and, when applicable, the anticipated dates of initiation and completion of associated research, process development, and mill trials;

(ii) The anticipated dates that the discharger expects the technologies and process modifications selected to achieve the limitations specified in paragraphs (b)(3) and (b)(4) of this section to be operational on a full-scale basis; and

(iii) The anticipated magnitude of reductions in effluent quantity and the anticipated improvements in effluent quality associated with each technology and process modification implemented as measured at the bleach plant (for bleach plant, pulping area and evaporator condensates flow and BAT parameters other than Adsorbable Organic Halides (AOX)) and at the end of the pipe (for AOX), and the dates the discharger expects those reductions and improvements to be achieved;

(4) Contingency plans in the event that any technology or process specified in the Milestones Plan need to be adjusted or alternative approaches developed to ensure that the limitations specified in paragraphs (b)(3)and (b)(4) of this section are met; and

(5) A signature by the responsible corporate officer as defined in 40 CFR 122.22.

(d) The following additional effluent limitations apply to all dischargers subject to this section in accordance with the previous subcategorization scheme unless the discharger certifies to the permitting authority that it is not using these compounds as biocides. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply. Concentration limitations will only apply to non-continuous dischargers:

SUBPART B

[Supplemental BAT effluent limitations for bleached kraft facilities where market pulp is produced]

Pullutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.011)(41.6)/y
Trichlorophenol	0.012	(0.068)(41.6)/y
y = wastewater discharged in kgal per ton product.		

SUBPART B

[Supplemental BAT effluent limitations for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximun for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.11)(35.4)/y
Trichlorophenol	0.010	(0.068)(35.4)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental BAT effluent limitations for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.011) (30.9)/y
Trichlorophenol	0.0088	(0.068) (30.9)/y
y = wastewater discharged in kgal per ton of product.		

(e) Pursuant to 40 CFR 122.44(i) and 122.45(h), a discharger must demonstrate compliance with the effluent limitations in paragraph (a)(1) or (b)(3) of this section, as applicable, by monitoring for all pollutants (except for AOX and COD) at the point where the wastewater containing those pollutants leaves the bleach plant. The permitting authority may impose effluent limitations and/or monitoring requirements on internal wastestreams for any other pollutants covered in this section as appropriate under 40 CFR 122.44(i) and 122.45(h). In addition, a discharger subject to a limitation on total pulping area condensate, evaporator condensate, and bleach plant wastewater flow under paragraph (b)(4)(i) of this section, for Tier II and Tier III,

must demonstrate compliance with that limitation by establishing and maintaining flow measurement equipment to monitor these flows at the point or points where they leave the pulping area, evaporator area, and bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998, as amended at 64 FR 36586, July 7, 1999]

§ 430.25 New source performance standards (NSPS).

New sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) The following standards apply to each new source that commenced discharge after June 15, 1988 and before June 15, 1998, provided that the new source was constructed to meet these standards:

SUBPART B

[1982 New Source Performance Standards for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	Annual average
	kg/kkg (or pounds per 1,000 lb) of product		
BOD5	10.3	5.5	2.88
TSS	18.2	9.5	5.00
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[1982 New Source Performance Standards for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	Annual average
	kg/kkg (or pounds per 1,000 lb) of product		
BOD5	8.5	4.6	2.41
TSS	14.6	7.6	4.00
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART B

[1982 New Source Performance Standards for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day	Average of daily values for 30 consecutive days	Annual average
	kg/kkg (or pounds per 1,000 lb) of product		
BOD5	5.7	3.1	1.62
TSS	9.1	4.8	2.53
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(b) Except as provided in paragraph (c) of this section—

(1) The following standards apply with respect to each new source fiber line that does not use an exclusively TCF bleaching process, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22, and that commences discharge after June 15, 1998:

SUBPART B

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Monthly average
TCDD	<ML [a]	[b]
TCDF	31.9 [c]	[b]
Chloroform	6.92 [d]	4.14 [d]
Trichlorosyringol	<ML [a]	[b]
3,4,5-trichlorocatechol	<ML [a]	[b]
3,4,6-trichlorocatechol	<ML [a]	[b]
3,4,5-trichloroguaiacol	<ML [a]	[b]
3,4,6-trichloroguaiacol	<ML [a]	[b]
4,5,6-trichloroguaiacol	<ML [a]	[b]
2,4,5-trichlorophenol	<ML [a]	[b]
2,4,6-trichlorophenol	<ML [a]	[b]
Tetrachlorocatechol	<ML [a]	[b]
Tetrachloroguaiacol	<ML [a]	[b]
2,3,4,6-tetrachlorophenol	<ML [a]	[b]
Pentachlorophenol	<ML [a]	[b]

	Continuous dischargers		Non-continuous dischargers
	Maximum for any 1 day (kg/kkg)	Monthly average (kg/kkg)	Annual average (kg/kkg)
AOX	0.476	0.272	0.208
BOD5	4.52	2.41	1.73
TSS	8.47	3.86	2.72
pH	[1]	[1]	[1]
COD	[e]	[e]	[e]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] Picograms per liter.
[d] Grams per 1,000 kilograms(g/kkg).
[e] [Reserved]
[1] Within the range of 5.0 to 9.0 at all times.

(2) The following standards apply with respect to each new source fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22, and that commences discharge after June 15, 1998:

SUBPART B

Pollutant or pollutant property	NSPS (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
AOX	<ML [a]	[b]	<ML [a]	[b]
BOD5	4.52 [d]	2.41	N/A	1.73
TSS	8.47 [d]	3.86	N/A	2.72
pH	[1]	[1]	[1]	[1]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.

[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]
[d] Kilograms per 1,000 kilograms (kg/kkg).
[1] Within the range of 5.0 to 9.0 at all times.

(c) With respect to each new source fiber line that is enrolled in the Voluntary Advanced Technology Incentives Program, dischargers subject to this section must achieve:

(1) The standards specified in paragraph (b)(1) of this section (except for AOX) or paragraph (b)(2) of this section, as applicable; and

(2) Standards for filtrates, flow, and AOX:

ULTIMATE VOLUNTARY ADVANCED TECHNOLOGY INCENTIVES PROGRAM NSPS

Tier	Filtrate recycling	Total pulping area condensate, evaporator condensate, and bleach plant wastewater flow (annual average)	AOX (kg/kkg)			
			Non-TCF [a]		TCF	
			Maximum for any 1 day	Annual average	Maximum for any 1 day	Annual average
Tier II	[b]	10 cubic meters/kkg	0.23	0.10	<ML [c]	[d]
Tier III	[b]	5 cubic meters/kkg	0.11	0.05	<ML [c]	[d]

[a] Non-TCF: Pertains to any fiber line that does not use exclusively TCF bleaching processes.
[b] Complete recycling to the chemical recovery system of all filtrates generated prior to bleaching.
[c] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[d] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.

(d) These additional standards apply to all new sources, regardless of when they commenced discharge, in accordance with the previous subcategorization scheme unless the discharger certifies to the permitting authority that it is not using these compounds as biocides. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply. Concentration limitations will only apply to non-continuous dischargers:

SUBPART B

[Supplemental NSPS for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.013)(36.6)/y
Trichlorophenol	0.012	(0.077)(36.6)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental NSPS for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.012)(31.7)/y
Trichlorophenol	0.010	(0.076)(31.7)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental NSPS for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.014)(25.1)/y
Trichlorophenol	0.0088	(0.084)(25.1)/y
y = wastewater discharged in kgal per ton of product.		

(e) Pursuant to 40 CFR 122.44(i) and 122.45(h), a discharger must demonstrate compliance with the limitations in paragraph (b)(1) or (c)(1) of this section, as applicable, by monitoring for all pollutants (except for AOX, COD, BOD5, TSS, and pH) at the point where the wastewater containing those pollutants leaves the bleach plant. The permitting authority may impose effluent limitations and/or monitoring requirements on internal wastestreams for any other pollutants covered in this section as appropriate under 40 CFR 122.44(i) and 122.45(h). In addition, a discharger subject to a limitation on total pulping area condensate, evaporator condensate, and bleach plant wastewater flow under paragraph (c)(2) of this section must demonstrate compliance with that limitation by establishing and maintaining flow measurement equipment monitoring these flows at the point or points where they leave the pulping area, evaporator area, and the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998]

§ 430.26 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and must achieve the following pretreatment standards for existing sources (PSES).

(a)(1) The following pretreatment standards apply with respect to each fiber line operated by an indirect discharger subject to this section, unless the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b) that it uses exclusively TCF bleaching processes at that fiber line. These pretreatment standards must be attained on or before April 16, 2001:

SUBPART B

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	[b]
TCDF	31.9[c]	[b]
Chloroform	6.92[d]	[d] 4.14
Trichlorosyringol	<ML[a]	[b]
3,4,5-trichlorocatechol	<ML[a]	[b]
3,4,6-trichlorocatechol	<ML[a]	[b]
3,4,5-trichloroguaiacol	<ML[a]	[b]
3,4,6-trichloroguaiacol	<ML[a]	[b]
4,5,6-trichloroguaiacol	<ML[a]	[b]
2,4,5-trichlorophenol	<ML[a]	[b]
2,4,6-trichlorophenol	<ML[a]	[b]
Tetrachlorocatechol	<ML[a]	[b]
Tetrachloroguaiacol	<ML[a]	[b]
2,3,4,6-tetrachlorophenol	<ML[a]	[b]
Pentachlorophenol	<ML[a]	[b]
AOX	2.64[e]	[e] 1.41

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.

[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.
[c] Picograms per liter.
[d] Grams per 1,000 kilograms (g/kkg).
[e] Kilograms per 1,000 kilograms (kg/kkg).

(2) The following pretreatment standards apply with respect to each fiber line operated by an indirect discharger subject to this section if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line. These pretreatment standards must be attained on or before April 16, 2001:

SUBPART B

Pollutant or pollutant parameter	PSES (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML [a]	([b])

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(b) The following pretreatment standards apply to all indirect dischargers, in accordance with the previous subcategorization scheme. An indirect discharger is not required to meet these pretreatment standards if it certifies to the pretreatment control authority that it is not using these compounds as biocides. In cases when POTWs find it necessary to impose mass effluent limitations, equivalent mass limitations are provided as guidance:

SUBPART B

[Supplemental PSES for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.011)(41.6)/y
Trichlorophenol	0.014	(0.082)(41.6)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSES for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.011)(35.4)/y
Trichlorophenol	0.012	(0.082)(35.4)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSES for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.011)(30.9)/y
Trichlorophenol	0.011	(0.082)(30.9)/y
y = wastewater discharged in kgal per ton of product		

(c) An indirect discharger must demonstrate compliance with the pretreatment standards in paragraph (a)(1) of this section by monitoring at the point where the wastewater containing those pollutants leaves the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998]

§ 430.27 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and must achieve the following pretreatment standards for new sources (PSNS).

(a)(1) The following pretreatment standards apply with respect to each fiber line that is a new source, unless the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12 that it uses exclusively TCF bleaching processes at that fiber line:

SUBPART B

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	Monthly average
TCDD	<ML[a]	[b]
TCDF	31.9[c]	[b]
Chloroform	6.92[d]	4.14[d]
Trichlorosyringol	<ML[a]	[b]
3,4,5-trichlorocatechol	<ML[a]	[b]
3,4,6-trichlorocatechol	<ML[a]	[b]
3,4,5-trichloroguaiacol	<ML[a]	[b]
3,4,6-trichloroguaiacol	<ML[a]	[b]
4,5,6-trichloroguaiacol	<ML[a]	[b]
2,4,5-trichlorophenol	<ML[a]	[b]
2,4,6-trichlorophenol	<ML[a]	[b]
Tetrachlorocatechol	<ML[a]	[b]
Tetrachloroguaiacol	<ML[a]	[b]
2,3,4,6-tetrachlorophenol	<ML[a]	[b]
Pentachlorophenol	<ML[a]	[b]
AOX	1.16[e]	0.814[e]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.
[c] Picograms per liter.
[d] Grams per 1,000 kilograms (g/kkg).
[e] Kilograms per 1,000 kilograms (kg/kkg).

(2) The following pretreatment standards apply with respect to each new source fiber line operated by an indirect discharger subject to this section if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line:

SUBPART B

Pollutant or pollutant parameter	PSNS (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML [a]	([b])

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(b) The following pretreatment standards apply to all new source indirect dischargers, regardless of when they commenced discharge, in accordance with the previous subcategorization scheme. An indirect discharger is not required to meet these pretreatment standards if it certifies to the pretreatment control authority that it is not using these compounds as biocides. In cases when POTWs find it necessary to impose mass-based effluent limitations, equivalent mass limitations are provided as guidance:

SUBPART B

[Supplemental PSNS for bleached kraft facilities where market pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0019	(0.013)(36.6)/y
Trichlorophenol	0.014	(0.093)(36.6)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSNS for bleached kraft facilities where paperboard, coarse paper, and tissue paper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.012)(31.7)/y
Trichlorophenol	0.012	(0.092)(31.7)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART B

[Supplemental PSNS for bleached kraft facilities where pulp and fine papers are produced and soda facilities where pulp and paper are produced]

Pollutant or pollutant parameter	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0014	(0.014)(25.1)/y
Trichlorophenol	0.011	(0.101)(25.1)/y
y = wastewater discharged in kgal per ton of product.		

(c) An indirect discharger must demonstrate compliance with the pretreatment standards in paragraph (a)(1) of this section by monitoring at the point where the wastewater containing those pollutants leaves the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239, Aug. 7, 1998]

§ 430.28 Best management practices (BMPs).

The definitions and requirements set forth in 40 CFR 430.03 apply to facilities in this subpart.

Subpart C—Unbleached Kraft Subcategory

§ 430.30 Applicability; description of the unbleached kraft subcategory.

The provisions of this subpart are applicable to discharges resulting from: the production of pulp and paper at unbleached kraft mills; the production of pulp and paper at unbleached kraft-neutral sulfite semi-chemical (cross recovery) mills; and the production of pulp and paper at combined unbleached kraft and semi-chemical mills, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system.

§ 430.31 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

§ 430.32 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART C

[BPT effluent limitations for unbleached kraft facilities]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.6	2.8
TSS	12.0	6.0
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0 at all times.

SUBPART C

[BPT effluent limitations for unbleached kraft facilities producing pulp and paper using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	8.0	4.0
TSS	12.5	6.25
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0 at all times.

SUBPART C

[BPT effluent limitations for unbleached kraft facilities where pulp and paper are produced using a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	[a]	[a]
TSS	[a]	[a]
pH	[a]	[a]

[a] [Reserved]

§ 430.33 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT), except that non-continuous dischargers shall not be subject to the maximum day and average-of-30-consecutive-days limitations, but shall be subject to annual average effluent limitations:

SUBPART C

[BCT effluent limitations for unbleached kraft facilities]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers	Non-continuous dischargers (annual average)	
		Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.6	2.8	1.9
TSS	12.0	6.0	3.6
pH	[1]	[1]	[1]

[1] Within the range of 6.0 to 9.0 at all times.

SUBPART C

[BCT effluent limitations for unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	8.0	4.0	2.9
TSS	12.5	6.25	3.57
pH	[1]	[1]	[1]

[1] Within the range of 6.0 to 9.0 at all times.

§ 430.34 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb), but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART C

[BAT effluent limitations for unbleached kraft facilities]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058	(0.011)(12.6)/y
Trichlorophenol	0.00053	(0.010)(12.6)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART C

[BAT effluent limitations for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00064	(0.011)(14.0)/y
Trichlorophenol	0.00059	(0.010)(14.0)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.35 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART C

[NSPS for unbleached kraft facilities where linerboard is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.4	1.8	0.94
TSS	5.8	3.0	1.6
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058	(0.015)(9.4)/y
Trichlorophenol	0.00053	(0.013)(9.4)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART C

[NSPS for unbleached kraft facilities where bag paper and other mixed products are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	5.0	2.71	1.4
TSS	9.1	4.8	2.5
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058	(0.012)(11.4)/y
Trichlorophenol	0.00053	(0.011)(11.4)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART C

[NSPS for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.9	2.1	1.1
TSS	7.3	3.8	1.9

SUBPART C—Continued

[NSPS for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00064	(0.013)(11.5)/y
Trichlorophenol	0.00059	(0.012)(11.5)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.36 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using those biocides. PSES must be attained on or before July 1, 1984:

SUBPART C

[PSES for unbleached kraft facilities]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.011)(12.6)/y	0.00058
Trichlorophenol	(0.010)(12.6)/y	0.00053
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases where POTWs find it necessary to impose mass effluent limitations.

SUBPART C

[PSES for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.011)(14.0)/y	0.00064
Trichlorophenol	(0.010)(14.0)/y	0.00059
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases where POTWs find it necessary to impose mass effluent limitations.

§ 430.37 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART C

[PSNS for unbleached kraft facilities where linerboard is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.015)(9.4)/y	0.00058
Trichlorophenol	(0.013)(9.4)/y	0.00053
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases where POTWs find it necessary to impose mass effluent limitations.

SUBPART C

[PSNS for unbleached kraft facilities where bag paper and other mixed products are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.012)(11.4)/y	0.00058
Trichlorophenol	(0.011)(11.4)/y	0.00053
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases where POTWs find it necessary to impose mass effluent limitations.

SUBPART C

[PSNS for unbleached kraft facilities where pulp and paper are produced using the unbleached kraft-neutral sulfite semi-chemical (cross recovery) process and/or a combined unbleached kraft and semi-chemical process, wherein the spent semi-chemical cooking liquor is burned within the unbleached kraft chemical recovery system]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.013)(11.5)/y	0.00064
Trichlorophenol	(0.012)(11.5)/y	0.00059
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases where POTWs find it necessary to impose mass effluent limitations.

Subpart D—Dissolving Sulfite Subcategory

§ 430.40 Applicability; description of the dissolving sulfite subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of pulp at dissolving sulfite mills.

§ 430.41 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

§ 430.42 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART D

[BPT effluent limitations for dissolving sulfite pulp facilities where nitration grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	41.4	21.5	12.1
TSS	70.65	38.05	20.9
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART D

[BPT effluent limitations for dissolving sulfite pulp facilities where viscose grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	44.3	23.0	12.9
TSS	70.65	38.05	20.9
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART D

[BPT effluent limitations for dissolving sulfite pulp facilities where cellophane grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	48.05	24.95	14.0
TSS	70.65	38.05	20.9
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART D

[BPT effluent limitations for dissolving sulfite pulp facilities where acetate grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	[1]50.80	[1]26.40	[1]14.83
TSS	70.65	38.05	20.9
pH	([2])	([2])	([2])

[1] BOD5 effluent limitations were remanded (Weyerhaeuser Company, et al v. Costle, 590 F. 2nd 1011; D.C. Circuit 1978).
[2] Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to annual average effluent limitations:

SUBPART D

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.7	0.35	0.2
TSS	0.15	0.1	0.05
pH	([1])	([1])	([1])

[1] Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to the annual average effluent limitations:

SUBPART D

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.1	0.05
TSS	0.15	0.1	0.05
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to the annual average effluent limitations:

SUBPART D

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.1	0.05
TSS	0.15	0.1	0.05
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

§ 430.43 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.42 of this subpart for the best practicable control technology currently available (BPT).

§ 430.44 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb) but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART D

[BAT effluent limitations for dissolving sulfite pulp facilities where nitration, viscose, or cellophane pulps are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.011)(66.0)/y
Trichlorophenol	0.019	(0.068)(66.0)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART D

[BAT effluent limitations for dissolving sulfite pulp facilities where acetate grade pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0033	(0.011)(72.7)/y
Trichlorophenol	0.021	(0.068)(72.7)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.45 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART D

[NSPS for dissolving sulfite pulp facilities where nitration grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	26.9	14.5	7.59
TSS	40.8	21.3	11.2
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.012)(59.0)/y
Trichlorophenol	0.019	(0.012)(59.0)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART D

[NSPS for dissolving sulfite pulp facilities where viscose grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	28.7	15.5	8.12
TSS	40.8	21.3	11.2
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.012)(59.0)/y
Trichlorophenol	0.019	(0.012)(59.0)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART D

[NSPS for dissolving sulfite pulp facilities where cellophane grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	31.2	16.8	8.80
TSS	40.8	21.3	11.2
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.012)(59.0)/y
Trichlorophenol	0.019	(0.076)(59.0)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART D

[NSPS for dissolving sulfite pulp facilities where acetate grade pulp is produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	39.6	21.4	11.2
TSS	41.1	21.5	11.3
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0033	(0.012)(65.7)/y
Trichlorophenol	0.021	(0.075)(65.7)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.46 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART D

[PSES for dissolving sulfite pulp facilities where nitration, viscose, or cellophane grade pulps are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.011)(66.0)/y	0.0030
Trichlorophenol	(0.082)(66.0)/y	0.023
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART D

[PSES for dissolving sulfite pulp facilities where acetate grade pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.011)(72.7)/y	0.0033
Trichlorophenol	(0.082)(72.7)/y	0.025
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

§ 430.47 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART D

[PSNS for dissolving sulfite pulp facilities where nitration, viscose, or cellophane grade pulps are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.012)(59.0)/y	0.0030
Trichlorophenol	(0.092)(59.0)/y	0.023
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART D

[PSNS for dissolving sulfite pulp facilities where acetate grade pulp is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.012)(65.7)/y	0.0033
Trichlorophenol	(0.091)(65.7)/y	0.025
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Subpart E—Papergrade Sulfite Subcategory

§ 430.50 Applicability; description of the papergrade sulfite subcategory.

The provisions of this subpart apply to discharges resulting from the: Integrated production of pulp and paper at papergrade sulfite mills, where blow pit pulp washing techniques are used; and the integrated production of pulp and paper at papergrade sulfite mills where vacuum or pressure drums are used to wash pulp.

§ 430.51 Specialized definitions.

(a) Except as provided in paragraphs (b) and (c) of this section, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part apply to this subpart.

(b) *Sulfite cooking liquor* is defined as bisulfite cooking liquor when the pH of the liquor is between 3.0 and 6.0 and as acid sulfite cooking liquor when the pH is less than 3.0.

(c) For this subpart, the segments for the papergrade sulfite subcategory are defined as follows:

(1) The calcium-, magnesium-, or sodium-based sulfite pulp segment consists of papergrade sulfite mills where pulp and paper are produced using an acidic cooking liquor of calcium, magnesium, or sodium sulfite, unless those mills are specialty grade sulfite mills;

(2) The ammonium-based sulfite pulp segment consists of papergrade sulfite mills where pulp and paper are produced using an acidic cooking liquor of ammonium sulfite, unless those mills are specialty grade sulfite mills;

(3) The specialty grade sulfite pulp segment consists of those papergrade

sulfite mills where a significant portion of production is characterized by pulp with a high percentage of alpha cellulose and high brightness sufficent to produce end products such as plastic molding compounds, saturating and laminating products, and photographic papers. The specialty grade segment also includes those mills where a major portion of production is 91 ISO brightness and above.

§ 430.52 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART E

[Bisulfite liquor/surface condensers; BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	31.8	16.55	9.30
TSS	43.95	23.65	12.99
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART E

[Bisulfite liquor/barometric condensers; BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	34.7	18.05	10.14
TSS	52.2	28.1	15.44
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART E

[Acid sulfite liquor/surface condensers; BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	32.3	16.8	9.44
TSS	43.95	23.65	12.99
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART E

[Acid sulfite liquor/barometric condensers; BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	35.55	18.5	10.39
TSS	52.2	28.1	15.44
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART E

[Bisulfite liquor/surface condensers; BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	26.7	13.9	7.81
TSS	43.95	23.65	12.99
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.
NOTE: Limitations above do not apply to mills using continuous digesters.

SUBPART E

[Bisulfite liquor/barometric condensers; BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	29.4	15.3	8.60
TSS	52.2	28.1	15.44
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.
NOTE: Limitations above do not apply to mills using continuous digesters.

SUBPART E

[Acid sulfite liquor/surface condensers; BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	29.75	15.5	8.71
TSS	43.95	23.65	12.99

SUBPART E—Continued

[Acid sulfite liquor/surface condensers; BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.
NOTE: Limitations above do not apply to mills using continuous digesters.

SUBPART E

[Acid sulfite liquor/barometric condensers; BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	32.5	16.9	9.49
TSS	52.2	28.1	15.44
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.
NOTE: Limitations above do not apply to mills using continuous digesters.

SUBPART E

[Continuous digesters; BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	38.15	19.85	11.15
TSS	53.75	28.95	15.91
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations:

SUBPART E

[BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.7	1.45	0.80
TSS	7.5	3.95	2.19
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART E

[BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.05	1.6	0.90
TSS	7.5	3.95	2.19
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations:

SUBPART E

[BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.1	0.05
TSS	2.55	1.35	0.75
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART E

[BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.35	0.2	0.1
TSS	2.55	1.35	0.75
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations:

SUBPART E

[BPT effluent limitations for papergrade sulfite facilities where blow pit washing techniques are used]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.35	0.2	0.1
TSS	1.7	0.9	0.5
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART E

[BPT effluent limitations for papergrade sulfite facilities where vacuum or pressure drums are used to wash pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.7	0.35	0.2
TSS	1.70	0.9	0.5
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

§ 430.53 Effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT). The limitations shall be the same as those specified for conventional pollutants in § 430.52 of this subpart for the best practicable control technology currently available (BCT).

§ 430.54 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a)(1) The following effluent limitations apply to all dischargers in the calcium-, magnesium-, or sodium-based sulfite pulp segment:

SUBPART E

[Production of Calcium-, Magnesium-, or Sodium-based Sulfite Pulps]

Pollutant or pollutant property	BAT effluent limitations			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML [a]	[b]	<ML [a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(2)(i) The following effluent limitations apply to all dischargers in the ammonium-based sulfite pulp segment:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	Monthly average
TCDD [a]	<ML [b]	[c]
TCDF [a]	<ML [b]	[c]
Chloroform [a]	[d]	[c]
Trichlorosyringol [a]	<ML [b]	[c]
3,4,5-trichlorocatechol [a]	<ML [b]	[c]
3,4,6-trichlorocatechol [a]	<ML [b]	[c]
3,4,5-trichloroguaiacol [a]	<ML [b]	[c]
3,4,6-trichloroguaiacol [a]	<ML [b]	[c]
4,5,6-trichloroguaiacol [a]	<ML [b]	[c]
2,4,5-trichlorophenol [a]	<ML [b]	[c]
2,4,6-trichlorophenol [a]	<ML [b]	[c]
Tetrachlorocatechol [a]	<ML [b]	[c]
Tetrachloroguaiacol [a]	<ML [b]	[c]
2,3,4,6-tetrachlorophenol [a]	<ML [b]	[c]
Pentachlorophenol [a]	<ML [b]	[c]

	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	[d]	[d]	[d]	[d]
COD	[d]	[d]	[d]	[d]

[a] These limitations do not apply with respect to fiber lines that use a TCF bleaching process as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[d] [Reserved]

(ii) The following effluent limitations apply to all dischargers in the ammonium-based sulfite pulp segment with respect to each fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant property	BAT effluent limitations (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML [a]	[b]	<ML [a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(3)(i) The following effluent limitations apply to all dischargers in the specialty grade pulp segment:

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	Monthly Average
TCDD [a]	<ML [b]	[c]
TCDF [a]	<ML [b]	[c]
Chloroform [a]	[d]	[c]
Trichlorosyringol [a]	<ML [b]	[c]
3,4,5-trichlorocatechol [a]	<ML [b]	[c]
3,4,6-trichlorocatechol [a]	<ML [b]	[c]
3,4,5-trichloroguaiacol [a]	<ML [b]	[c]
3,4,6-trichloroguaiacol [a]	<ML [b]	[c]
4,5,6-trichloroguaiacol [a]	<ML [b]	[c]
2,4,5-trichlorophenol [a]	<ML [b]	[c]
2,4,6-trichlorophenol [a]	<ML [b]	[c]
Tetrachlorocatechol [a]	<ML [b]	[c]
Tetrachloroguaiacol [a]	<ML [b]	[c]
2,3,4,6-tetrachlorophenol [a]	<ML [b]	[c]
Pentachlorophenol [a]	<ML [b]	[c]

	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	[d]	[d]	[d]	[d]
COD	[d]	[d]	[d]	[d]

[a] These limitations do not apply with respect to fiber lines that use a TCF bleaching process as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[d] [Reserved]

(ii) The following effluent limitations apply to dischargers in the specialty grade pulp segment with respect to each fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART E—PRODUCTION OF SPECIALTY GRADE PULPS

Pollutant or pollutant property	BAT effluent limitations (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML [a]	[b]	<ML [a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(b) The following additional effluent limitations apply to each discharger subject to this section in accordance with the previous subcatgorization scheme unless it certifies to the permitting authority that it is not using these compounds as biocides. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply. Concentration limitations will only apply to non-continuous dischargers:

SUBPART E

[Supplemental BAT effluent limitations]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058exp(0.017x)	((0.011)(12.67)exp(0.017x))/y
Trichlorophenol	0.0036exp(0.017x)	((0.068)(12.67)exp(0.017x))/y
x = percent sulfite pulp in final product.		
y = wastewater discharged in kgal per ton of product.		

(c) Pursuant to 40 CFR 122.44(i) and 122.45(h), a discharger must demonstrate compliance with the limitations in paragraphs (a)(2) or (a)(3) of this section, as applicable, by monitoring for all pollutants (except for AOX and COD) at the point where the wastewater containing those pollutants leaves the bleach plant. The permitting authority may impose effluent limitations and/or monitoring requirements on internal wastestreams for

any other pollutants covered in this section as appropriate under 40 CFR 122.44(i) and 122.45(h).

§ 430.55 New source performance standards (NSPS).

New sources subject to this subpart must achieve the following new source performance standards (NSPS), as applicable.

(a) The following standards apply to each new source regardless of when it commenced discharge:

SUBPART E

[1982 NSPS]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.38exp(0.017x) ...	2.36exp(0.017x)	Average of daily values for 30 consecutive days divided by 1.91.
TSS	5.81exp(0.017x) ...	3.03exp(0.017x)	Average of daily values for 30 consecutive days divided by 1.90.
pH	(1)	(1)	(1)

x = percent sulfite pulp in final product

[1] Within the range of 5.0 to 9.0 at all times.

(b) The following standards apply with respect to each new source fiber line that commences discharge after June 15, 1998.

(1) The following standards apply to all new sources in the calcium-, magnesium-, or sodium-based sulfite pulp segment:

SUBPART E

[Production of Calcium-, Magnesium-, or Sodium-based Sulfite Pulps]

Pollutant or pollutant property	NSPS			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML[a]	[b]	<ML[a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(2)(i) The following standards apply to all new sources in the ammonium-based sulfite pulp segment:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Monthly average
TCDD[a]	<ML[b]	[c]
TCDF[a]	<ML[b]	[c]
Chloroform[a]	[d]	[d]
Trichlorosyringol[a]	<ML[b]	[c]
3,4,5-trichlorocatechol[a]	<ML[b]	[c]
3,4,6-trichlorocatechol[a]	<ML[b]	[c]
3,4,5-trichloroguaiacol[a]	<ML[b]	[c]
3,4,6-trichloroguaiacol[a]	<ML[b]	[c]

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS—Continued

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Monthly average
4,5,6-trichloroguaiacol [a]	<ML [b]	[c]
2,4,5-trichlorophenol [a]	<ML [b]	[c]
2,4,6-trichlorophenol [a]	<ML [b]	[c]
Tetrachlorocatechol [a]	<ML [b]	[c]
Tetrachloroguaiacol [a]	<ML [b]	[c]
2,3,4,6-tetrachlorophenol [a]	<ML [b]	[c]
Pentachlorophenol [a]	<ML [b]	[c]

	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	[d]	[d]	[d]	[d]
COD	[d]	[d]	[d]	[d]

[a] These limitations do not apply with respect to fiber lines that use a TCF bleaching process as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[d] [Reserved]

(ii) The following standards apply to all new sources in the ammonium-based sulfite pulp segment with respect to each fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant property	NSPS (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML [a]	[b]	<ML [a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(3)(i) The following standards apply to all new sources in the specialty grade sulfite pulp segment:

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Monthly average
TCDD [a]	<ML [b]	[c]
TCDF [a]	<ML [b]	[c]
Chloroform [a]	[d]	[d]
Trichlorosyringol [a]	<ML [b]	[c]
3,4,5-trichlorocatechol [a]	<ML [b]	[c]
3,4,6-trichlorocatechol [a]	<ML [b]	[c]
3,4,5-trichloroguaiacol [a]	<ML [b]	[c]
3,4,6-trichloroguaiacol [a]	<ML [b]	[c]
4,5,6-trichloroguaiacol [a]	<ML [b]	[c]

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS—Continued

Pollutant or pollutant property	NSPS	
	Maximum for any 1 day	Monthly average
2,4,5-trichlorophenol [a]	<ML [b]	[c]
2,4,6-trichlorophenol [a]	<ML [b]	[c]
Tetrachlorocatechol [a]	<ML [b]	[c]
Tetrachloroguaiacol	<ML [b]	[c]
2,3,4,6-tetrachlorophenol [a]	<ML [b]	[c]
Pentachlorophenol [a]	<ML [b]	[c]

	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	[d]	[d]	[d]	[d]
COD	[d]	[d]	[d]	[d]

[a] These limitations do not apply with respect to fiber lines that use a TCF bleaching process as disclosed by the discharger in its permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[d] [Reserved]

(ii) The following standards apply to all new sources within the specialty grade sulfite pulp segment with respect to each fiber line that uses exclusively TCF bleaching processes, as disclosed by the discharger in its NPDES permit application under 40 CFR 122.21(g)(3) and certified under 40 CFR 122.22:

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS

Pollutant or pollutant property	NSPS (TCF)			
	Continuous dischargers		Non-continuous dischargers	
	Maximum for any 1 day	Monthly average	Maximum for any 1 day	Annual average
	kg/kkg (or pounds per 1,000 lb) of product			
AOX	<ML [a]	[b]	<ML [a]	[b]
COD	[c]	[c]	[c]	[c]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, permitting authorities may do so as appropriate.
[c] [Reserved]

(c) The following standards apply to each new source regardless of when it commenced discharge, unless it certifies to the permitting authority that it is not using these compounds as biocides. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply. Concentration limitations will only apply to non-continuous dischargers:

SUBPART E

[Supplemental NSPS]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058exp(0.017x)	((0.015)(9.12)exp(0.017x))/y
Trichlorophenol	0.0036exp(0.017x)	((0.094)(9.12)exp(0.017x))/y

SUBPART E—Continued

[Supplemental NSPS]

Pollutant or pollutant property	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
x = percent sulfite pulp in final product. y = wastewater discharged in kgal per ton of product.		

(d) Pursuant to 40 CFR 122.44(i) and 122.45(h), a discharger must demonstrate compliance with the standards in paragraphs (b)(2) or (b)(3) of this section, as applicable, by monitoring for all pollutants (except for AOX, COD, BOD5, TSS, and pH) at the point where the wastewater containing those pollutants leaves the bleach plant. The permitting authority may impose effluent limitations and/or monitoring requirements on internal wastestreams for any other pollutants covered in this section as appropriate under 40 CFR 122.44(i) and 122.45(h).

§ 430.56 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and must achieve the following pretreatment standards for existing sources (PSES).

(a) The following pretreatment standards must be attained on or before April 16, 2001.

(1) The following pretreatment standards apply to all indirect dischargers in the calcium-, magnesium-, or sodium-based sulfite pulp segment:

SUBPART E

[Production of Calcium-, Magnesium-, or Sodium-based Sulfite Pulps]

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Monthly average
	kg/kkg (or pounds per 1,000 lb) of product	
AOX	<ML[a]	[b]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(2)(i) The following pretreatment standards apply to all indirect dischargers in the ammonium-based sulfite pulp segment:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Monthly average
TCDD[a]	<ML[b]	[c]
TCDF[a]	<ML[b]	[c]
Trichlorosyringol[a]	<ML[b]	[c]
3,4,5-trichlorocatechol[a]	<ML[b]	[c]
3,4,6-trichlorocatechol[a]	<ML[b]	[c]
3,4,5-trichloroguaiacol[a]	<ML[b]	[c]
3,4,6-trichloroguaiacol[a]	<ML[b]	[c]
4,5,6-trichloroguaiacol[a]	<ML[b]	[c]
2,4,5-trichlorophenol[a]	<ML[b]	[c]
2,4,6-trichlorophenol[a]	<ML[b]	[c]
Tetrachlorocatechol[a]	<ML[b]	[c]
Tetrachloroguaiacol[a]	<ML[b]	[c]
2,3,4,6-tetrachlorophenol[a]	<ML[b]	[c]

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS—Continued

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Monthly average
Pentachlorophenol [a]	<ML [b]	[c]

[a] These limitations do not apply with respect to fiber lines operated by any indirect discharger that discloses to the pretreatment control authority, at the time it submits the report required under 40 CFR 403.12(b), (d), or (e), that it uses a TCF bleaching process at that fiber line.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(ii) The following pretreatment standards apply with respect to each new source fiber line operated by an indirect discharger producing ammonium-based sulfite pulps if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b) that it uses exclusively TCF bleaching processes at that fiber line:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant parameter	PSES (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML [a]	[b]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(3)(i) The following pretreatment standards apply to all indirect dischargers in the specialty grade sulfite pulp segment:

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	Monthly average
TCDD [a]	<ML [b]	[c]
TCDF [a]	<ML [b]	[c]
Trichlorosyringol [a]	<ML [b]	[c]
3,4,5-trichlorocatechol [a]	<ML [b]	[c]
3,4,6-trichlorocatechol [a]	<ML [b]	[c]
3,4,5-trichloroguaiacol [a]	<ML [b]	[c]
3,4,6-trichloroguaiacol [a]	<ML [b]	[c]
4,5,6-trichloroguaiacol [a]	<ML [b]	[c]
2,4,5-trichlorophenol [a]	<ML [b]	[c]
2,4,6-Trichlorophenol [a]	<ML [b]	[c]
Tetrachlorocatechol [a]	<ML [b]	[c]
Tetrachloroguaiacol [a]	<ML [b]	[c]
2,3,4,6-tetrachlorophenol [a]	<ML [b]	[c]
Pentachlorophenol [a]	<ML [b]	[c]

[a] These limitations do not apply with respect to fiber lines operated by any indirect discharger that discloses to the pretreatment control authority, at the time it submits the report required under 40 CFR 403.12(b), (d), or (e), that it uses a TCF bleaching process at that fiber line.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(ii) The following pretreatment standards apply with respect to each fiber line operated by an indirect discharger producing specialty grade sulfite pulps if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line. These pretreatment standards must be attained on or before April 16, 2001:

SUBPART E

Pollutant or pollutant parameter	PSES (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML [a]	[b]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(b) The following pretreatment standards apply to each indirect discharger, in accordance with the previous subcategorization scheme, unless it certifies to the pretreatment control authority that it is not using these compounds as biocides. In cases when POTWs find it necessary to impose mass effluent limitations, equivalent mass limitations are provided as guidance:

SUBPART E

Pollutant or pollutant property	Supplemental PSES	
	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058exp(0.017x)	((0.011)(12.67)exp(0.017x))/y
Trichlorophenol	0.0043exp(0.017x)	((0.082)(12.67)exp(0.017x))/y
x = percent sulfite pulp in final product.		
y = wastewater discharged in kgal per ton of product.		

(c) An indirect discharger must demonstrate compliance with the pretreatment standards in paragraphs (a)(2) or (a)(3) of this section, as applicable, by monitoring for all pollutants at the point where the wastewater containing those pollutants leaves the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42239 Aug. 7, 1998]

§ 430.57 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS).

(a) (1) The following pretreatment standards apply to each indirect discharger in the calcium-,

magnesium-, or sodium-based sulfite pulp segment that is a new source:

SUBPART E

[Production of Calcium-, Magnesium-, or Sodium-Based Sulfite Pulps]

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	Monthly average
	kg/kkg (or pounds per 1,000 lb) of product	
AOX	<ML [a]	[b]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(2)(i) The following standards apply to each indirect discharger in the ammonium-based sulfite pulp segment that is a new source:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	Monthly average
TCDD[a]	<ML[b]	[c]
TCDF[a]	<ML[b]	[c]
Trichlorosyringol[a]	<ML[b]	[c]
3,4,5-trichlorocatechol[a]	<ML[b]	[c]
3,4,6-trichlorocatechol[a]	<ML[b]	[c]
3,4,5-trichloroguaiacol[a]	<ML[b]	[c]
3,4,6-trichloroguaiacol[a]	<ML[b]	[c]
4,5,6-trichloroguaiacol[a]	<ML[b]	[c]
2,4,5-trichlorophenol[a]	<ML[b]	[c]
2,4,6-trichlorophenol[a]	<ML[b]	[c]
Tetrachlorocatechol[a]	<ML[b]	[c]
Tetrachloroguaiacol[a]	<ML[b]	[c]
2,3,4,6-tetrachlorophenol[a]	<ML[b]	[c]
Pentachlorophenol[a]	<ML[b]	[c]

[a] These limitations do not apply with respect to fiber lines operated by any indirect discharger that discloses to the pretreatment control authority, at the time it submits the report required under 40 CFR 403.12 (b), (d), or (e), that it uses a TCF bleaching process at that fiber line.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(ii) The following pretreatment standards apply with respect to each new source fiber line operated by an indirect discharger producing ammonium-based sulfite pulps if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line:

SUBPART E—PRODUCTION OF AMMONIUM-BASED SULFITE PULPS

Pollutant or pollutant parameter	PSNS (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML[a]	[b]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(3)(i) The following pretreatment standards apply to each indirect discharger in the specialty grade sulfite pulp segment that is a new source:

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	Monthly average
TCDD[a]	<ML[b]	[c]
TCDF[a]	<ML[b]	[c]
Trichlorosyringol[a]	<ML[b]	[c]
3,4,5-trichlorocatechol[a]	<ML[b]	[c]
3,4,6-trichlorocatechol[a]	<ML[b]	[c]
3,4,5-trichloroguaiacol[a]	<ML[b]	[c]
3,4,6-trichloroguaiacol[a]	<ML[b]	[c]
4,5,6-trichloroguaiacol[a]	<ML[b]	[c]
2,4,5-trichlorophenol[a]	<ML[b]	[c]
2,4,6-trichlorophenol[a]	<ML[b]	[c]
Tetrachlorocatechol[a]	<ML[b]	[c]
Tetrachloroguaiacol[a]	<ML[b]	[c]
2,3,4,6-tetrachlorophenol[a]	<ML[b]	[c]

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS—Continued

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	Monthly average
Pentachlorophenol [a]	<ML [b]	[c]

[a] These limitations do not apply with respect to fiber lines operated by any indirect discharger that discloses to the pretreatment control authority, at the time it submits the report required under 40 CFR 403.12 (b), (d), or (e), that it uses a TCF bleaching process at that fiber line.
[b] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[c] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(ii) The following pretreatment standards apply with respect to each new source fiber line operated by an indirect discharger producing specialty grade sulfite pulps if the indirect discharger discloses to the pretreatment control authority in a report submitted under 40 CFR 403.12(b), (d), or (e) that it uses exclusively TCF bleaching processes at that fiber line:

SUBPART E—PRODUCTION OF SPECIALTY GRADE SULFITE PULPS

Pollutant or pollutant parameter	PSNS (TCF)	
	Maximum for any 1 day	Monthly average
AOX	<ML [a]	[b]

[a] "<ML" means less than the minimum level specified in § 430.01(i) for the particular pollutant.
[b] This regulation does not specify this type of limitation for this pollutant; however, pretreatment control authorities may do so as appropriate.

(b) The following pretreatment standards shall apply to each new source indirect dischargers unless the indirect discharger certifies to the pretreatment control authority that it is not using these compounds as biocides. In cases when POTWs find it necessary to impose mass effluent standards, equivalent mass standards are provided as guidance:

SUBPART E

Pollutant or pollutant property	Supplemental PSNS	
	Maximum for any 1 day	
	kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00058exp (0.017x)	((0.015)(9.12)exp(0.017x))/y
Trichlorophenol	0.0043exp (0.017x)	((0.114)(9.12)exp(0.017x))/y
x = percent sulfite pulp in final product.		
y = wastewater discharged in kgal per ton of product.		

(c) An indirect discharger must demonstrate compliance with the pretreatment standards in paragraphs (a)(2) or (a)(3) of this section, as applicable, by monitoring for all pollutants at the point where the wastewater containing those pollutants leaves the bleach plant.

[63 FR 18635, Apr. 15, 1998; 63 FR 42240, Aug. 7, 1998]

§ 430.58 Best management practices (BMPs).

The definitions and requirements set forth in 40 CFR 430.03 apply to facilities in this subpart.

Subpart F—Semi-Chemical Subcategory

§ 430.60 Applicability; description of the semi-chemical subcategory.

The provisions of this subpart are applicable to discharges resulting from the integrated production of pulp and paper at semi-chemical mills.

§ 430.61 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

§ 430.62 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART F

[BPT effluent limitations for ammonia base mills]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	8.0	4.0
TSS	10.0	5.0
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0 at all times.

SUBPART F

[BPT effluent limitations for sodium base mills]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	8.7	4.35
TSS	11.0	5.5
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0 at all times.

§ 430.63 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.62 of this subpart for the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average-of-30-consecutive-days limitations, but shall be subject to annual average effluent limitations determined by dividing the average-of-30-consecutive-days limitations for BOD5 by 1.36 and TSS by 1.36.

§ 430.64 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1,000 lb), but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART F

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0012	(0.029)(10.3)/y
Trichlorophenol	0.00043	(0.010)(10.3)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.65 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART F

[NSPS]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.0	1.6	0.84
TSS	5.8	3.0	1.6
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0012	(0.041)(7.3)/y

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Trichlorophenol	0.00043	(0.014)(7.3)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.66 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART F

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(10.3)/y	0.0014
Trichlorophenol	(0.010)(10.3)/y	0.00043
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

§ 430.67 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART F

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	
	Milligrams/liter	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.045)(7.3)/y	0.0014
Trichlorophenol	(0.014)(7.3)/y	0.00043
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

Subpart G—Mechanical Pulp Subcategory

§ 430.70 Applicability; description of the mechanical pulp subcategory.

The provisions of this subpart are applicable to discharges resulting from: the production of pulp and paper at groundwood chemi-mechanical mills; the production of pulp and paper at groundwood mills through the application of the thermo-mechanical process; the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills; and the integrated production of pulp and fine paper at groundwood mills.

§ 430.71 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

§ 430.72 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.5	7.05	3.96
TSS	19.75	10.65	5.85
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	10.6	5.55	3.12
TSS	15.55	8.35	4.59
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	7.45	3.9	2.19
TSS	12.75	6.85	3.76
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	6.85	3.6	2.0
TSS	11.75	6.3	3.5
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

(b) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of wet barking operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.9	0.45	0.25
TSS	2.6	1.45	0.80
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.9	0.45	0.3
TSS	2.7	1.45	0.75
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.15	0.55	0.30
TSS	2.0	1.1	0.60
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.1	0.55	0.35
TSS	1.95	1.1	0.60
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(c) The following limitations establish the quantity or quality of pollutants or pollutant parameters, controlled by this section, resulting from the use of log washing or chip washing operations, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs and/or chips which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations, but shall be subject to the annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.05	0.05	0.05
TSS	0.25	0.15	0.10
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.05	0.05	0.05
TSS	0.30	0.15	0.05
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.05	0.05
TSS	0.20	0.15	0.10
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.05	0.05
TSS	0.2	0.15	0.10

SUBPART G—Continued

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(d) The following limitations establish the quantity or quality of pollutants or pollutant properties, controlled by this section, resulting from the use of log flumes or log ponds, which may be discharged by a point source subject to the provisions of this subpart. These limitations are in addition to the limitations set forth in paragraph (a) of this section and shall be calculated using the proportion of the mill's total production due to use of logs which are subject to such operations. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to the annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.05	0.05
TSS	0.55	0.3	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.15	0.15	0.05
TSS	0.60	0.35	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.25	0.1	0.05
TSS	0.45	0.25	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	0.2	0.05	0.05
TSS	0.4	0.25	0.15
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

(e) For those mills using zinc hydrosulfite as a bleaching agent in the manufacturing process, the following effluent limitations are to be added to the base limitations set forth in paragraph (a) of this section. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound. Non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations, but shall be subject to annual average effluent limitations:

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood chemi-mechanical mills are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.34	0.17	0.11

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.26	0.13	0.09

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.30	0.15	0.10

SUBPART G

[BPT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
Zinc	0.275	0.135	0.090

§ 430.73 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

(a)(1) The following applies to: mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs:

(2) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.72 of this subpart for the best practicable control technology currently available (BPT).

(b) [Reserved]

§ 430.74 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) The following applies to mechanical pulp facilities where pulp and

paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT), except that non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb), but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound:

SUBPART G

[BAT effluent limitations for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00097	(0.011)(21.1)/y
Trichlorophenol	0.00088	(0.010)(21.1)/y
Zinc	0.26	(3.0)(21.1)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART G

[BAT effluent limitations for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0011	(0.011)(23.8)/y
Trichlorophenol	0.00099	(0.010)(23.8)/y
Zinc	0.30	(3.0)(23.8)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART G

[BAT effluent limitations for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0010	(0.011)(21.9)/y
Trichlorophenol	0.00092	(0.010)(21.9)/y
Zinc	0.27	(3.0)(21.9)/y
y = wastewater discharged in kgal per ton of product.		

(b) [Reserved]

§ 430.75 New source performance standards (NSPS).

(a) The following applies to mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound:

SUBPART G

[NSPS for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.6	2.5	1.3
TSS	8.7	4.6	2.4
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00097	(0.017)(13.8)/y
Trichlorophenol	0.00088	(0.015)(13.8)/y
Zinc	0.17	(3.0)(13.8)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[NSPS for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.6	2.5	1.3

SUBPART G—Continued

[NSPS for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
TSS	7.3	3.8	2.0
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0011	(0.016)(16.8)/y
Trichlorophenol	0.00099	(0.014)(16.8)/y
Zinc	0.21	(3.0)(16.8)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART G

[NSPS mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.5	1.9	0.99
TSS	5.8	3.0	1.58
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0010	(0.016) (15.4)/y
Trichlorophenol	0.00092	(0.014) (15.4)/y
Zinc	0.19	(3.0) (15.4)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

(b) [Reserved]

§ 430.76 Pretreatment standards for existing sources (PSES).

(a) The following applies to mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works

must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES). Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit-issuing authority that they are not using this bleaching compound. PSES must be attained on or before July 1, 1984:

SUBPART G

[PSES for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/1)	Kg/kkg (or pounds per 1,000 1b) of product [a]
Pentachlorophenol	(0.011) (21.1)/y	0.00097
Trichlorophenol	(0.010) (21.1)/y	0.00088
Zinc	(3.0) (21.1)/y	0.26
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART G

[PSES for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/1)	Kg/kkg (or pounds per 1,000 1b) of product [a]
Pentachlorophenol	(0.011) (23.8)/y	0.0011
Trichlorophenol	(0.010) (23.8)/y	0.00099
Zinc	(3.0) (23.8)/y	0.30
y = wasterwater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART G

[PSNS for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.011)(21.9)/y	0.0010
Trichlorophenol	(0.010)(21.9)/y	0.00092
Zinc	(3.0)(21.9)/y	0.27
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

(b) [Reserved]

§ 430.77 Pretreatment standards for new sources (PSNS).

(a) The following applies to mechanical pulp facilities where pulp and

paper at groundwood mills are produced through the application of the thermo-mechanical process; mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs; and mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs: except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for new sources (PSNS). Pentachlorophenol and trichlorophenol limitations are only applicable at facilities where chlorophenolic-containing biocides are used. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. Zinc limitations are only applicable at facilities where zinc hydrosulfite is used as a bleaching agent. Permittees not using zinc hydrosulfite as a bleaching agent must certify to the permit issuing authority that they are not using this bleaching compound:

SUBPART G

[PSNS for mechanical pulp facilities where pulp and paper at groundwood mills are produced through the application of the thermo-mechanical process]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.017)(13.8)/y	0.00097
Trichlorophenol	(0.015)(13.8)/y	0.00088
Zinc	(3.0)(13.8)/y	0.17
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART G

[PSNS for mechanical pulp facilities where the integrated production of pulp and coarse paper, molded pulp products, and newsprint at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.016)(16.8)/y	0.0011
Trichlorophenol	(0.014)(16.8)/y	0.00099
Zinc	(3.0)(16.8)/y	0.21
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART G

[PSNS for mechanical pulp facilities where the integrated production of pulp and fine paper at groundwood mills occurs]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.016)(15.4)/y	0.0010
Trichlorophenol	(0.014)(15.4)/y	0.00092
Zinc	(3.0)(15.4)/y	0.19
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

(b) [Reserved]

Subpart H—Non-Wood Chemical Pulp Subcategory

§ 430.80 Applicability; description of the non-wood chemical pulp subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of pulp and paper at non-wood chemical pulp mills. This subcategory includes, but is not limited to, mills producing non-wood pulps from chemical pulping processes such as kraft, sulfite, or soda.

§ 430.81 Specialized definitions.

The general definitions, abbreviations, and methods of analysis set forth in 40 CFR 401 and §430.01 of this part shall apply to this subpart.

§ 430.82 Effluent limitations representing the degree of effluent reduction attainable by the application of best practicable control technology currently available (BPT). [Reserved]

§ 430.83 Effluent limitations representing the degree of effluent reduction attainable by the application of best conventional pollutant control technology (BCT). [Reserved]

§ 430.84 Effluent limitations representing the degree of effluent reduction attainable by the application of best available technology economically achievable (BAT). [Reserved]

§ 430.85 New source performance standards (NSPS). [Reserved]

§ 430.86 Pretreatment standards for existing sources (PSES). [Reserved]

§ 430.87 Pretreatment standards for new sources (PSNS). [Reserved]

Subpart I—Secondary Fiber Deink Subcategory

§ 430.90 Applicability; description of the secondary fiber deink subcategory.

The provisions of this subpart are applicable to discharges resulting from the integrated production of pulp and paper at deink mills.

§ 430.91 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and §430.01 of this part shall apply to this subpart.

§ 430.92 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART I

[BPT effluent limitations]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	18.1	9.4	5.3
TSS	24.05	12.95	7.12
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.93 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.92 of this subpart for the best practicable control technology currently available (BPT).

§ 430.94 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb) but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART I

[Facilities where fine or tissue paper is produced]

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.029)(24.4)/y
Trichlorophenol	0.0069	(0.068)(24.4)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART I

[Facilities where newsprint is produced]

Pollutant or pollutant property	BAT effluent limitations	
	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.029)(24.4)/y
Trichlorophenol	0.0010	(0.010)(24.4)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.95 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART I

[Facilities where fine paper is produced]

[NSPS]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	5.7	3.1	1.6
TSS	8.7	4.6	2.4
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.045)(15.9)/y
Trichlorophenol	0.0069	(0.104)(15.9)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART I

[Facilities where tissue paper is produced]

[NSPS]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	9.6	5.2	2.72
TSS	13.1	6.8	3.58
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.036)(19.5)/y
Trichlorophenol	0.0069	(0.085)(19.5)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART I

[Facilities where newsprint is produced]

[NSPS]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	6.0	3.2	1.7
TSS	12.0	6.3	3.3
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.044)(16.2)/y
Trichlorophenol	0.0010	(0.015)(16.2)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.96 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART I

[Facilities where fine or tissue paper is produced]

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(24.4)/y	0.0033
Trichlorophenol	(0.082)(24.4)/y	0.0084
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

SUBPART I

[Facilities where newsprint is produced]

Pollutant or pollutant property	PSES	
	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(24.4)/y	0.0033
Trichlorophenol	(0.010)(24.4)/y	0.0010
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

§ 430.97 Pretreatment standards for new sources (PSNS).

(a) Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART I

[Facilities where fine paper is produced]

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.049)(15.9)/y	0.0033
Trichlorophenol	(0.126)(15.9)/y	0.0084
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

SUBPART I

[Facilities where tissue paper is produced]

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.040)(19.5)/y	0.0033
Trichlorophenol	(0.103)(19.5)/y	0.0084
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

SUBPART I

[Facilities where newsprint is produced]

Pollutant or pollutant property	PSNS	
	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.048)(16.2)/y	0.0033
Trichlorophenol	(0.015)(16.2)/y	0.0010
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass equivalent limitations.

Subpart J—Secondary Fiber Non-Deink Subcategory

§ 430.100 Applicability; description of the secondary fiber non-deink subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of: Paperboard from wastepaper; tissue paper from wastepaper without deinking at secondary fiber mills; molded products from wastepaper without deinking at secondary fiber mills; and builders' paper and roofing felt from wastepaper.

§ 430.101 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided below, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

(b) Noncorrugating medium furnish subdivision mills are mills where recycled corrugating medium is not used in the production of paperboard.

(c) Corrugating medium furnish subdivision mills are mills where only recycled corrugating medium is used in the production of paperboard.

§ 430.102 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT):

SUBPART J

[BPT effluent limitations for secondary fiber non-deink facilities where paperboard from wastepaper is produced—noncorrugating medium finish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	3.0	1.5
TSS	5.0	2.5
pH	(1)	(1)

[1] 1Within the range of 6.0 to 9.0 at all times.

SUBPART J

[BPT effluent limitations for secondary fiber non-deink facilities where paperboard from wastepaper is produced—corrugating medium finish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.7	2.8
TSS	9.2	4.6
pH	(1)	(1)

[1] Within the range of 6.0 to 9.0 at all times.

SUBPART J

[BPT effluent limitations for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	5.0	3.0
TSS	5.0	3.0
pH	(1)	(1)
Setteable Solids	(2)	(2)

[1] Within the range of 6.0 to 9.0 at all times.
[2] Not to exceed 0.2 ml/l.

(b) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART J

[BPT effluent limitations for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average days)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.7	7.1	4.0
TSS	17.05	9.2	5.1
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART J

[BPT effluent limitations for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average days)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.4	2.3	1.3
TSS	10.8	5.8	3.2
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.103 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.102 of this subpart for the best practicable control technology currently available (BPT).

(b) For secondary fiber non-deink facilities where paperboard from wastepaper is produced, non-continuous dischargers shall not be subject to the maximum day and average-of-30-consecutive-days limitations, but shall be subject to annual average effluent limitations determined by dividing the average-of-30-consecutive-days limitations for BOD5 and TSS by 1.77 and 2.18.

(c) For secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced, non-continuous dischargers shall not be subject to the maximum day and average-of-30-consecutive-days limitations, but shall be subject to annual average effluent limitations determined by dividing the average-of-30-consecutive-days limitations for BOD5 and TSS by 1.90 and 1.90.

§ 430.104 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the

application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb) but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART J

[BAT effluent limitations for secondary fiber non-deink facilities where paperboard from wastepaper is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00087	(0.029)(7.2)/y
Trichlorophenol	0.00030	(0.010)(7.2)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART J

[BAT effluent limitations for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0017	(0.029)(14.4)/y
Trichlorophenol	0.00060	(0.010)(14.4)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART J

[BAT effluent limitations for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.029)(25.2)/y
Trichlorophenol	0.0011	(0.010)(25.2)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART J

[BAT effluent limitations for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0026	(0.029)(21.1)/y
Trichlorophenol	0.00088	(0.010)(21.1)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.105 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART J

[NSPS for secondary fiber non-deink facilities where paperboard from wastepaper is produced—noncorrugating medium furnish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.6	1.4	0.73
TSS	3.5	1.8	0.95
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00087	(0.065)(3.2)/y
Trichlorophenol	0.00030	(0.023)(3.2)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART J

[NSPS for secondary fiber non-deink facilities where paperboard from wastepaper is produced—corrugating medium finish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.9	2.1	1.1
TSS	4.4	2.3	1.2
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.00087	(0.065)(3.2)/y
Trichlorophenol	0.00030	(0.023)(3.2)/y

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART J

[NSPS for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	1.7	0.94	0.49
TSS	2.7	1.40	0.74
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0017	(0.155)(2.7)/y
Trichlorophenol	0.00060	(0.053)(2.7)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART J

[NSPS for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.6	2.5	1.3
TSS	10.2	5.3	2.8
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0030	(0.045)(16.3)/y
Trichlorophenol	0.0011	(0.015)(16.3)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART J

[NSPS for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	2.1	1.1	0.58
TSS	4.4	2.3	1.21
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0026	(0.107)(5.7)/y
Trichlorophenol	0.00088	(0.037)(5.7)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.106 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: Comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART J

[PSES for secondary fiber non-deink facilities where paperboard from wastepaper is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(7.2)/y	0.00096
Trichlorophenol	(0.010)(7.2)/y	0.00030
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART J

[PSES for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(14.4)y	0.0019
Trichlorophenol	(0.010)(14.4)y	0.00060
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART J

[PSES for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(25.2)y	0.0034
Trichlorophenol	(0.010)(25.2)/y	0.0011
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART J

[PSES for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(21.1)y	0.0028
Trichlorophenol	(0.010)(21.1)y	0.00088
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

§ 430.107 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: Comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART J

[PSNS for secondary fiber non-deink facilities where paperboard from wastepaper is produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.072)(3.2)/y	0.00096
Trichlorophenol	(0.023)(3.2)/y	0.00030
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART J

[PSNS for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.171)(2.7)/y	0.0019
Trichlorophenol	(0.053)(2.7)/y	0.00060

SUBPART J—Continued

[PSNS for secondary fiber non-deink facilities where builders' paper and roofing felt from wastepaper are produced]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART J

[PSNS for secondary fiber non-deink facilities where tissue from wastepaper is produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.049)(16.3)/y	0.0034
Trichlorophenol	(0.015)(16.3)/y	0.0011
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART J

[PSNS for secondary fiber non-deink facilities where molded products from wastepaper are produced without deinking]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.118)(5.7)/y	0.0028
Trichlorophenol	(0.037)(5.7)/y	0.00088
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Subpart K—Fine and Lightweight Papers from Purchased Pulp Subcategory

§ 430.110 Applicability; description of the fine and lightweight papers from purchased pulp subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of: fine paper at nonintegrated mills; and lightweight paper at nonintegrated mills.

§ 430.111 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided in paragraphs (b) and (c) of this section, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

(b) Cotton fiber furnish subdivision mills are those mills where significant quantities of cotton fibers (equal to or greater than 4 percent of the total product) are used in the production of fine papers.

(c) Wood fiber furnish subdivision mills are those mills where cotton fibers are not used in the production of fine papers.

§ 430.112 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must

achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART K

[BPT effluent limitations for non-integrated mills where fine paper is produced from purchased pulp—wood fiber furnish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	8.2	4.25	2.4
TSS	11.0	5.9	3.2
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART K

[BPT effluent limitations for non-integrated mills where fine paper is produced from purchased pulp—cotton fiber furnish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	17.4	9.1	5.1
TSS	24.3	13.1	7.2
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART K

[BPT effluent limitations for non-integrated mills where lightweight papers are produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	24.1	13.2	7.37
TSS	21.6	10.6	6.0
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART K

[BPT effluent limitations for non-integrated mills where lightweight papers are produced from purchased pulp—electrical grade papers subdivision

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	38.0	20.9	11.7
TSS	34.2	16.7	9.5
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.113 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.102 of this subpart for the best practicable control technology currently available (BPT).

§ 430.114 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb) but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART K

[BAT effluent limitations for non-integrated mills where fine paper is produced from purchased pulp—wood fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0018	(0.029)(15.2)/y
Trichlorophenol	0.00064	(0.010)(15.2)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART K

[BAT effluent limitations for non-integrated mills where fine paper is produced from purchased pulp—cotton fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0051	(0.029)(42.3)/y
Trichlorophenol	0.0018	(0.010)(42.3)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART K

[BAT effluent limitations for non-integrated mills where lightweight papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0059	(0.029)(48.7)/y
Trichlorophenol	0.0020	(0.010)(48.7)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART K

[BAT effluent limitations for non-integrated mills where lightweight papers are produced from purchased pulp—electrical grade papers subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0093	(0.029)(76.9)/y
Trichlorophenol	0.0032	(0.010)(76.9)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.115 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART K

[NSPS for non-integrated mills where fine paper is produced from purchased pulp—wood fiber furnish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (Annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	3.5	1.9	1.0
TSS	4.4	2.3	1.2
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0018	(0.047)(9.4)/y
Trichlorophenol	0.00064	(0.016)(9.4)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART K

[NSPS for non-integrated mills where fine paper is produced from purchased pulp—cotton fiber furnish subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	7.8	4.2	2.2
TSS	9.5	4.9	2.6
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0051	(0.039)(31.1)/y
Trichlorophenol	0.0018	(0.014)(31.1)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART K

[NSPS for non-integrated mills where lightweight papers are produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	13.7	6.7	4.5
TSS	12.0	5.2	3.2
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0059	(0.037)(38.2)/y
Trichlorophenol	0.0020	(0.013)(38.2)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART K

[NSPS for non-integrated mills where lightweight papers are produced from purchased pulp—electrical grade papers subdivision]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	24.1	11.7	7.9
TSS	21.1	9.2	5.6
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0093	(0.033)(66.8)/y
Trichlorophenol	0.0032	(0.012)(66.8)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.116 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: Comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART K

[PSES for non-integrated mills where fine paper is produced from purchased pulp—wood fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(15.2)/y	0.0020
Trichlorophenol	(0.010)(15.2)/y	0.00064
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART K

[PSES for non-integrated mills where fine paper is produced from purchased pulp—cotton fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(42.3)/y	0.0056
Trichlorophenol	(0.010)(42.3)/y	0.0018
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART K

[PSES for non-integrated mills where lightweight papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(48.7)/y	0.0065
Trichlorophenol	(0.010)(48.7)/y	0.0032
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART K

[PSES for non-integrated mills where lightweight papers are produced from purchased pulp—electrical grade papers subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(76.9)/y	0.010
Trichlorophenol	(0.010)(76.9)/y	0.0032
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

§ 430.117 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: Comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART K

[PSNS for non-integrated mills where fine paper is produced from purchased pulp—wood fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.052)(9.4)/y	0.0020
Trichlorophenol	(0.016)(9.4)/y	0.0064

SUBPART K—Continued

[PSNS for non-integrated mills where fine paper is produced from purchased pulp—wood fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART K

[PSNS for non-integrated mills where fine paper is produced from purchased pulp—cotton fiber furnish subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.044)(31.1)/y	0.0056
Trichlorophenol	(0.014)(31.1)/y	0.0018
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART K

[PSNS for non-integrated mills where lightweight papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.041)(38.2)/y	0.0065
Trichlorophenol	(0.013)(38.2)/y	0.0020
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART K

[PSNS for non-integrated mills where lightweight papers are produced from purchased pulp—electrical grade papers subdivision]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.037)(66.8)/y	0.010
Trichlorophenol	(0.012)(66.8)/y	0.0032
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

Subpart L—Tissue, Filter, Non-Woven, and Paperboard From Purchased Pulp Subcategory

§ 430.120 Applicability; description of the tissue, filter, non-woven, and paperboard from purchased pulp subcategory.

The provisions of this subpart are applicable to discharges resulting from the production of tissue papers at non-integrated mills, filter and non-woven papers at non-integrated mills, and paperboard at non-integrated mills. The production of electrical grades of board and matrix board is not included in this subpart.

§ 430.121 Specialized definitions.

For the purpose of this subpart, the general definitions, abbreviations, and methods of analysis set forth in 40 CFR part 401 and § 430.01 of this part shall apply to this subpart.

§ 430.122 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days limitations but shall be subject to annual average effluent limitations:

SUBPART L

[BPT effluent limitations for non-integrated mills where tissue papers are produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	11.4	6.25	3.49
TSS	10.25	5.0	2.84
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART L

[BPT effluent limitations for non-integrated mills where filter and non-woven papers are produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	29.6	16.3	9.1
TSS	26.6	13.0	7.4
pH	(1)	(1)	(1)

1 Within the range of 5.0 to 9.0 at all times.

SUBPART L

[BPT effluent limitations for non-integrated mills where paperboard is produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers	Non-continuous dischargers (Annual average)	
		Maximum for any 1 day	Average of daily values for 30 consecutive days
BOD5	6.5	3.6	2.0
TSS	5.8	2.8	1.6
pH	(1)	(1)	(1)

[1] Within the range of 5.0 to 9.0 at all times.

§ 430.123 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart shall achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT): The limitations shall be the same as those specified for conventional pollutants (which are defined in 40 CFR 401.16) in § 430.122 of this subpart for the best practicable control technology currently available (BPT).

§ 430.124 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart where chlorophenolic-containing biocides are used must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT). Non-continuous dischargers shall not be subject to the maximum day mass limitations in kg/kkg (lb/1000 lb) but shall be subject to concentration limitations. Concentration limitations are only applicable to non-continuous dischargers. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART L

[BAT effluent limitations for non-integrated mills where tissue papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0028	(0.029)(22.9)/y
Trichlorophenol	0.00096	(0.010)(22.9)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART L

[BAT effluent limitations for non-integrated mills where filter and non-woven papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0072	(0.029)(59.9)/y
Trichlorophenol	0.0025	(0.010)(59.9)/y
y = wastewater discharged in kgal per ton of product.		

SUBPART L

[BAT effluent limitations for non-integrated mills where paperboard is produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.029)(12.9)/y
Trichlorophenol	0.00054	(0.010)(12.9)/y
y = wastewater discharged in kgal per ton of product.		

§ 430.125 New source performance standards (NSPS).

Any new source subject to this subpart must achieve the following new source performance standards (NSPS), except that non-continuous dischargers shall not be subject to the maximum day and average of 30 consecutive days effluent limitations for BOD5 and TSS, but shall be subject to annual average effluent limitations. Also, for non-continuous dischargers, concentration limitations (mg/l) shall apply, where provided. Concentration limitations will only apply to non-continuous dischargers. Only facilities where chlorophenolic-containing biocides are used shall be subject to pentachlorophenol and trichlorophenol limitations. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART L

[NSPS for non-integrated mills where tissue papers are produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	7.0	3.4	2.3
TSS	6.0	2.6	1.6
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0028	(0.035)(19.1)/y
Trichlorophenol	0.00096	(0.012)(19.1)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART L

[NSPS for non-integrated mills where filter and non-woven papers are produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	17.1	8.3	5.6
TSS	15.0	6.6	4.0
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0072	(0.037)(47.5)/y
Trichlorophenol	0.0025	(0.013)(47.5)/y
y = wastewater discharged in kgal per ton at all times.		

[1] Within the range of 5.0 to 9.0 at all times.

SUBPART L

[NSPS for non-integrated mills where paperboard is produced from purchased pulp]

Pollutant or pollutant property	Kg/kkg (or pounds per 1,000 lb) of product		
	Continuous dischargers		Non-continuous dischargers (annual average)
	Maximum for any 1 day	Average of daily values for 30 consecutive days	
BOD5	4.0	1.9	1.3
TSS	3.5	1.5	0.9
pH	(1)	(1)	(1)

	Maximum for any 1 day	
	Kg/kkg (or pounds per 1,000 lb) of product	Milligrams/liter
Pentachlorophenol	0.0016	(0.033)(11.2)/y
Trichlorophenol	0.00054	(0.012)(11.2)/y
y = wastewater discharged in kgal per ton at all times.		

(1) Within the range of 5.0 to 9.0 at all times.

§ 430.126 Pretreatment standards for existing sources (PSES).

Except as provided in 40 CFR 403.7 and 403.13, any existing source subject to this subpart that introduces pollutants into a publicly owned treatment works must: Comply with 40 CFR part 403; and achieve the following pretreatment standards for existing sources (PSES) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides. PSES must be attained on or before July 1, 1984:

SUBPART L

[PSES for non-integrated mills where tissue papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(22.9)/y	0.0031
Trichlorophenol	(0.010)(22.9)/y	0.00096
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART L

[PSES for non-integrated mills where filter and non-woven papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(59.9)/y	0.0080
Trichlorophenol	(0.010)(59.9)/y	0.0025
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART L

[PSES for non-integrated mills where paperboard is produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.032)(12.9)/y	0.0017
Trichlorophenol	(0.010)(12.9)/y	0.00054
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

§ 430.127 Pretreatment standards for new sources (PSNS).

Except as provided in 40 CFR 403.7, any new source subject to this subpart that introduces pollutants into a publicly owned treatment works must: Comply with 40 CFR part 403; and achieve the following pretreatment standards for new sources (PSNS) if it uses chlorophenolic-containing biocides. Permittees not using chlorophenolic-containing biocides must certify to the permit-issuing authority that they are not using these biocides:

SUBPART L

[PSNS for non-integrated mills where tissue papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.038)(19.1)/y	0.0031
Trichlorophenol	(0.012)(19.1)/y	0.00096

SUBPART L—Continued

[PSNS for non-integrated mills where tissue papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART L

[PSNS for non-integrated mills where filter and non-woven papers are produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.040)(47.5)/y	0.0080
Trichlorophenol	(0.013)(47.5)/y	0.0025
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

SUBPART L

[PSNS for non-integrated mills where paperboard is produced from purchased pulp]

Pollutant or pollutant property	Maximum for any 1 day	
	Milligrams/liter (mg/l)	Kg/kkg (or pounds per 1,000 lb) of product [a]
Pentachlorophenol	(0.037)(11.2)/y	0.0017
Trichlorophenol	(0.012)(11.2)/y	0.00054
y = wastewater discharged in kgal per ton of product.		

[a] The following equivalent mass limitations are provided as guidance in cases when POTWs find it necessary to impose mass effluent limitations.

APPENDIX A TO PART 430—METHODS 1650 AND 1653

METHOD 1650—ADSORBABLE ORGANIC HALIDES BY ADSORPTION AND COULOMETRIC TITRATION

1.0 Scope and Application

1.1 This method is for determination of adsorbable organic halides (AOX) associated with the Clean Water Act; the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation, and Liability Act; and other organic halides amenable to combustion and coulometric titration. The method is designed to meet the survey and monitoring requirements of the Environmental Protection Agency (EPA).

1.2 The method is applicable to the determination of AOX in water and wastewater. This method is a combination of several existing methods for organic halide measurements (References 1 through 7).

1.3 The method can be used to measure organically-bound halides (chlorine, bromine, iodine) present in dissolved or suspended form. Results are reported as organic chloride (Cl^-). The detection limit of the method is usually dependent on interferences rather than instrumental limitations. A method detection limit (MDL; Reference 8) of 6.6 µg/L, and a minimum level (ML; Section 18) of 20 µg/L, can be achieved with no interferences present.

1.4 This method is for use by or under the supervision of analysts experienced in the use of a combustion/micro-coulometer. Each laboratory that uses this method must demonstrate the ability to generate acceptable results using the procedures described in Section 9.2.

1.5 Any modification of the method beyond those expressly permitted (Section 9.1.2) is subject to application and approval

of an alternate test procedure under 40 CFR 136.4 and 136.5.

2.0 Summary of Method

2.1 Sample preservation: Residual chlorine that may be present is removed by the addition of sodium thiosulfate. Samples are adjusted to a pH <2 and maintained at 0 to 4 °C until analysis.

2.2 Sample analysis: Organic halide in water is determined by adsorption onto granular activated carbon (GAC), washing the adsorbed sample and GAC to remove inorganic halide, combustion of the sample and GAC to form the hydrogen halide, and titration of the hydrogen halide with a microcoulometer, as shown in Figure 1.

2.3 Micro-coulometer.

2.3.1 This detector operates by maintaining a constant silver-ion concentration in a titration cell. An electric potential is applied to a solid silver electrode to produce silver ions in the cell. As hydrogen halide produced from the combustion of organic halide enters the cell, it is partitioned into an acetic acid electrolyte where it precipitates as silver halide. The current produced is integrated over the combustion period. The electric charge is proportional to the number of moles of halogen captured in the cell (Reference 6).

2.3.2 The mass concentration of organic halides is reported as an equivalent concentration of organically bound chloride (Cl^-).

3.0 Definitions

3.1 Adsorbable organic halides is defined as the analyte measured by this method. The nature of the organo-halides and the presence of semi-extractable material will influence the amount measured and interpretation of results.

3.2 Definitions for terms used in this method are given in the glossary at the end of the method (Section 18).

4.0 Interferences

4.1 Solvents, reagents, glassware, and other sample processing hardware may yield elevated readings from the micro-coulometer. All materials used in the analysis shall be demonstrated to be free from interferences under the conditions of analysis by running method blanks initially and with each sample batch (samples started through the adsorption process in a given eight-hour shift, to a maximum of 20 samples). Specific selection of reagents and purification of solvents may be required.

4.2 Glassware is cleaned by detergent washing in hot water, rinsing with tap water and distilled water, capping with aluminum foil, and baking at 450 °C for at least one hour. For some glassware, immersion in a chromate cleaning solution prior to detergent washing may be required. If blanks from glassware without cleaning or with fewer cleaning steps show no detectable organic halide, the cleaning steps that do not eliminate organic halide may be omitted.

4.3 Most often, contamination results from methylene chloride vapors in laboratories that perform organic extractions. Heating, ventilating, and air conditioning systems that are shared between the extraction laboratory and the laboratory in which organic halide measurements are performed transfer the methylene chloride vapors to the air in the organic halide laboratory. Exposure of the activated carbon used in the analysis results in contamination. Separate air handling systems, charcoal filters, and glove boxes can be used to minimize this exposure.

4.4 Activated carbon.

4.4.1 The purity of each lot of activated carbon must be verified before each use by measuring the adsorption capacity and the background level of halogen (Section 9.5). The stock of activated carbon should be stored in its granular form in a glass container that is capped tightly. Protect carbon at all times from sources of halogen vapors.

4.4.2 Inorganic substances such as chloride, chlorite, bromide, and iodide will adsorb on activated carbon to an extent dependent on their original concentration in the aqueous solution and the volume of sample adsorbed. Treating the activated carbon with a solution of nitrate causes competitive desorption of inorganic halide species. However, if the inorganic halide concentration is greater than 2,000 times the organic halide concentration, artificially high results may be obtained.

4.4.3 Halogenated organic compounds that are weakly adsorbed on activated carbon are only partially recovered from the sample. These include certain alcohols and acids such as chloroethanol and chloroacetic acid that can be removed from activated carbon by the nitrate wash.

4.5 Polyethylene gloves should be worn when handling equipment surfaces in contact with the sample to prevent transfer of contaminants that may be present on the hands.

5.0 Safety

5.1 The toxicity or carcinogenicity of each reagent used in this method has not been precisely determined; however, each chemical substance should be treated as a potential health hazard. Exposure to these substances should be reduced to the lowest possible level. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of material safety data sheets (MSDSs) should be made available to all personnel involved in the chemical analysis. Additional information on laboratory

safety can be found in References 9 through 11.

5.2 This method employs strong acids. Appropriate clothing, gloves, and eye protection should be worn when handling these substances.

5.3 Field samples may contain high concentrations of toxic volatile compounds. Sample containers should be opened in a hood and handled with gloves that will prevent exposure.

6.0 Equipment and Supplies

NOTE: Brand names, suppliers, and part numbers are for illustrative purposes only. No endorsement is implied. Equivalent performance may be achieved using apparatus and materials other than those specified here, but demonstration of equivalent performance that meets the requirements of this method is the responsibility of the laboratory.

6.1 Sampling equipment.

6.1.1 Bottles: 100- to 4000-mL, amber glass, sufficient for all testing (Section 8.2). Detergent water wash, chromic acid rinse, rinse with tap and distilled water, cover with aluminum foil, and heat to 450 °C for at least one hour before use.

6.1.2 PTFE liner: Cleaned as above and baked at 100 to 200 °C for at least one hour.

6.1.3 Bottles and liners must be lot certified to be free of organic halide by running blanks according to this method.

6.2 Scoop for granular activated carbon (GAC): Capable of precisely measuring 40 mg (±5 mg) GAC (Dohrmann Measuring Cup 521–021, or equivalent).

6.3 Batch adsorption and filtration system.

6.3.1 Adsorption system: Rotary shaker, wrist action shaker, ultrasonic system, or other system for assuring thorough contact of sample with activated carbon. Systems different from the one described below must be demonstrated to meet the performance requirements in Section 9 of this method.

6.3.1.1 Erlenmeyer flasks: 250- to 1500-mL with ground-glass stopper, for use with rotary shaker.

6.3.1.2 Shake table: Sybron Thermolyne Model LE ''Big Bill'' rotator/shaker, or equivalent.

6.3.1.3 Rack attached to shake table to permit agitation of 16 to 25 samples simultaneously.

6.3.2 Filtration system (Figure 2).

6.3.2.1 Vacuum filter holder: Glass, with fritted-glass support (Fisher Model 09–753E, or equivalent).

6.3.2.2 Polycarbonate filter: 0.40 to 0.45 micron, 25-mm diameter (Micro Separations Inc, Model K04CP02500, or equivalent).

6.3.2.3 Filter forceps: Fisher Model 09–753–50, or equivalent, for handling filters. Two forceps may better aid in handling filters. Clean by washing with detergent and water, rinsing with tap and deionized water, and air drying on aluminum foil.

6.3.2.4 Vacuum flask: 500- to 1500-mL (Fisher 10–1800, or equivalent).

6.3.2.5 Vacuum Source: A pressure/vacuum pump, rotary vacuum pump, or other vacuum source capable of providing at least 610 mm (24 in.) Hg vacuum at 30 L/min free air displacement.

6.3.2.6 Stopper and tubing to mate the filter holder to the flask and the flask to the pump.

6.3.2.7 Polyethylene gloves: (Fisher 11–394–110–B, or equivalent).

6.4 Column adsorption system.

6.4.1 Adsorption module: Dohrmann AD–2, Mitsubishi TXA–2, or equivalent with pressurized sample and nitrate-wash reservoirs, adsorption columns, column housings, gas and gas pressure regulators, and receiving vessels. For each sample reservoir, there are two adsorption columns connected in series. A small steel funnel for filling the columns and a rod for pushing out the carbon are also required. A schematic of the column adsorption system is shown in Figure 3.

6.4.2 Adsorption columns: Pyrex, 5 ±0.2 cm long × 2 mm ID, to hold 40 mg of granular activated carbon (GAC).

6.4.3 Cerafelt: Johns-Manville, or equivalent, formed into plugs using stainless steel borer (2 mm ID) with ejection rod (available from Dohrmann or Mitsubishi) to hold 40 mg of granular activated carbon (GAC). Caution: Handle Cerafelt with gloves.

6.4.4 Column holders: To support adsorption columns.

6.5 Combustion/micro-coulometer system: Commercially available as a single unit or assembled from parts. At the time of the writing of this method, organic halide units were commercially available from the Dohrmann Division of Rosemount Analytical, Santa Clara, California; Euroglas BV, Delft, the Netherlands; and Mitsubishi Chemical Industries, Ltd., Tokyo, Japan.

6.5.1 Combustion system: Older systems may not have all of the features shown in Figure 4. These older systems may be used provided the performance requirements (Section 9) of this method are met.

6.5.1.1 Combustion tube: Quartz, capable of being heated to 800 to 1000 °C and accommodating a boat sampler. The tube must contain an air lock for introduction of a combustion boat, connections for purge and combustion gas, and connection to the micro-coulometer cell.

6.5.1.2 Tube furnace capable of controlling combustion tube in the range of 800 to 1000 °C.

6.5.1.3 Boat sampler: Capable of holding 35 to 45 mg of activated carbon and a polycarbonate filter, and fitting into the

combustion tube (Section 6.5.1.1). Some manufacturers offer an enlarged boat and combustion tube for this purpose. Under a time-controlled sequence, the boat is first moved into an evaporation zone where water and other volatiles are evaporated, and then into the combustion zone where the carbon and all other organic material in the boat are burned in a flowing oxygen stream. The evolved gases are transported by a non-reactive carrier gas to the micro-coulometer cell.

6.5.1.4 Motor driven boat sampler: Capable of advancing the combustion boat into the furnace in a reproducible time sequence. A suggested time sequence is as follows:

A. Establish initial gas flow rates: 160 mL/min CO_2; 40 mL/min O_2.

B. Sequence start.

C. Hold boat in hatch for five seconds to allow integration for baseline subtraction.

D. Advance boat into vaporization zone.

E. Hold boat in vaporization zone for 110 seconds.

F. Establish gas flow rates for combustion: 200 mL/min O_2; 0 mL/min CO_2; advance boat into pyrolysis zone (800 °C).

G. Hold boat in pyrolysis zone for six minutes.

H. Return gas flow rates to initial values; retract boat into hatch to cool and to allow remaining HX to be swept into detector (approximately two minutes).

I. Stop integration at 10 minutes after sequence start.

NOTE: If the signal from the detector does not return to baseline, it may be necessary to extend the pyrolysis time. The sequence above may need to be optimized for each instrument.

6.5.1.5 Absorber: Containing sulfuric acid to dry the gas stream after combustion to prevent backflush of electrolyte is highly recommended.

6.5.2 Micro-coulometer system: Capable of detecting the equivalent of 0.2 µg of Cl^- at a signal-to-noise ratio of 2; capable of detecting the equivalent of 1 µg of Cl^- with a relative standard deviation less than 10%, and capable of accumulating a minimum of the equivalent of 500 µg of Cl^- before a change of electrolyte is required.

6.5.2.1 Micro-coulometer cell: The three cell designs presently in use are shown in Figure 1. Cell operation is described in Section 2.

6.5.2.2 Cell controller: Electronics capable of measuring the small currents generated in the cell and accumulating and displaying the charge produced by hydrogen halides entering the cell. A strip-chart recorder is desirable for display of accumulated charge.

6.6 Miscellaneous glassware: nominal sizes are specified below; other sizes may be used, as necessary.

6.6.1 Volumetric flasks: 5-, 10-, 25-, 50-, 100-, and 1000-mL.

6.6.2 Beakers: 100-, 500-, and 1000-mL.

6.6.3 Volumetric pipets: 1- and 10-mL with pipet bulbs.

6.6.4 Volumetric micro-pipets: 10-, 20-, 50-, 100-, 200-, and 500-µL with pipet control (Hamilton 0010, or equivalent).

6.6.5 Graduated cylinders: 10-, 100-, and 1000-mL.

6.7 Micro-syringes: 10-, 50-, and 100-µL.

6.8 Balances.

6.8.1 Top-loading, capable of weighing 0.1 g.

6.8.2 Analytical, capable of weighing 0.1 mg.

6.9 pH meter.

6.10 Wash bottles: 500- to 1000-mL, PTFE or polyethylene.

6.11 Strip-chart recorder: suggested but not required—useful for determining end of integration (Section 11.4.2).

7.0 Reagents and Standards

7.1 Granular activated carbon (GAC): 75 to 150 µm (100 to 200 mesh); (Dohrmann, Mitsubishi, Carbon Plus, or equivalent), with chlorine content less than 1 µg Cl^- per scoop (<25 µg Cl^- per gram), adsorption capacity greater than 1000 µg Cl^- (as 2,4,6-trichlorophenol) per scoop (≤25,000 µg/g), inorganic halide retention of less than 1 µg Cl^- per scoop in the presence of 10 mg of inorganic halide (<20 µg Cl^- per gram in the presence of 2500 mg of inorganic halide), and that meets the other test criteria in this method.

7.2 Reagent water: Water in which organic halide is not detected by this method.

7.2.1 Preparation: Reagent water may be generated by:

7.2.1.1 Activated carbon: Pass tap water through a carbon bed (Calgon Filtrasorb-300, or equivalent).

7.2.1.2 Water purifier: Pass tap water through a purifier (Millipore Super Q, or equivalent).

7.2.2 pH adjustment: Adjust the pH of the reagent water to <2 with nitric acid for all reagent water used in this method, except for the acetic acid solution (Section 7.13).

7.3 Nitric acid (HNO_3): Concentrated, analytical grade.

7.4 Sodium chloride (NaCl) solution (100 µg/mL of Cl^-): Dissolve 0.165g NaCl in 1000 mL reagent water. This solution is used for cell testing and for the inorganic halide rejection test.

7.5 Ammonium chloride (NH_4Cl) solution (100 µg/mL of Cl^-): Dissolve 0.1509 g NH_4Cl in 1000 mL reagent water.

7.6 Sulfuric acid: Reagent grade (specific gravity 1.84).

7.7 Oxygen: 99.9% purity.

7.8 Carbon Dioxide: 99.9% purity.

7.9 Nitrate stock solution: In a 1000-mL volumetric flask, dissolve 17g of $NaNO_3$ in approximately 100 mL of reagent water, add 1.4 mL nitric acid (Section 7.3) and dilute to the mark with reagent water.

7.10 Nitrate wash solution: Dilute 50 mL of nitrate stock solution (Section 7.9) to 1000 mL with reagent water.

7.11 Sodium thiosulfate ($Na_2S_2O_3$) solution (1 N): Weigh 79 grams of $Na_2S_2O_3$ in a 1-L volumetric flask and dilute to the mark with reagent water.

7.12 Trichlorophenol solutions.

NOTE: The calibration solutions in this section employ 100-mL volumes. For determinations requiring a larger or smaller volume, increase or decrease the size of the volumetric flasks commensurately. For example, if a 1-L sample is to be analyzed, use 1000-mL flasks (Sections 7.12.3.1 and 7.12.4) and 10 times the volume of reagent water (Sections 7.12.3.1 and 7.12.4). The volume of stock solution added to the calibration solutions and precision and recovery (PAR) test solution remain as specified (Sections 7.12.3.2 and 7.12.4) so that the same amount of chloride is delivered to the coulometric cell regardless of the volume of the calibration and PAR solutions.

7.12.1 Methanol: HPLC grade.

7.12.2 Trichlorophenol stock solution (1.0 mg/mL of Cl^-): Dissolve 0.186 g of 2,4,6-trichlorophenol in 100 mL of halide-free methanol.

7.12.3 Trichlorophenol calibration solutions.

7.12.3.1 Place approximately 90 mL of reagent water in each of five 100-mL volumetric flasks.

7.12.3.2 Using a calibrated micro-syringe or micro-pipets, add 2, 5, 10, 30, and 80 µL of the trichlorophenol stock solution (Section 7.12.2) to the volumetric flasks and dilute each to the mark with reagent water to produce calibration solutions of 2, 5, 10, 30, and 80 µg Cl^- per 100 mL of solution (20, 50, 100, 300, and 800 µg/L).

7.12.3.3 Some instruments may have a calibration range that does not extend to 800 µg/L (80 µg of Cl^-). For those instruments, a narrower dynamic range may be used. However, if the concentration of halide in a sample exceeds that range, the sample must be diluted to bring the concentration within the range calibrated.

7.12.4 Trichlorophenol precision and recovery (PAR) test solution (10 µg/L of Cl^-): Partially fill a 100-mL volumetric flask, add 10 µL of the stock solution (Section 7.12.2), and dilute to the mark with reagent water.

7.13 Acetic acid solution: Containing 30 to 70% acetic acid in deionized water, per the instrument manufacturer's instructions.

8.0 Sample Collection, Preservation, and Storage

8.1 Sample preservation.

8.1.1 Residual chlorine: If the sample is known or suspected to contain free chlorine, the chlorine must be reduced to eliminate positive interference that may result from continued chlorination reactions. A knowledge of the process from which the sample is collected may be of value in determining whether dechlorination is necessary. Immediately after sampling, test for residual chlorine using the following method or an alternative EPA method (Reference 12):

8.1.1.1 Dissolve a few crystals of potassium iodide in the sample and add three to five drops of a 1% starch solution. A blue color indicates the presence of residual chlorine.

8.1.1.2 If residual chlorine is found, add 1 mL of sodium thiosulfate solution (Section 7.11) for each 2.5 ppm of free chlorine or until the blue color disappears. Do not add an excess of sodium thiosulfate. Excess sodium thiosulfate may cause decomposition of a small fraction of the OX.

8.1.2 Acidification: Adjust the pH of aqueous samples to <2 with nitric acid. Acidification inhibits biological activity and stabilizes chemical degradation, including possible dehalogenation reactions that may occur at high pH. Acidification is necessary to facilitate thorough adsorption.

8.1.3 Refrigeration: Maintain samples at a temperature of 0 to 4 °C from time of collection until analysis.

8.2 Collect the amount of sample necessary for analysis (Section 11) and all QC tests (Section 9) in an amber glass bottle of the appropriate size (Section 6.1.1).

8.3 Analyze samples no less than three days nor more than six months after collection.

9.0 Quality Control

9.1 Each laboratory that uses this method is required to operate a formal quality assurance program. The minimum requirements of this program consist of an initial demonstration of laboratory capability, an ongoing analysis of standards and blanks as tests of continued performance, and analysis of matrix spike and matrix spike duplicate (MS/MSD) samples to assess accuracy and precision. Laboratory performance is compared to established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1.1 The laboratory shall make an initial demonstration of the ability to produce acceptable results with this method. This ability is demonstrated as described in Section 9.2.

9.1.2 The laboratory is permitted to modify this method to improve separations or lower the costs of measurements, provided that all performance specifications are met. Each time a modification is made to the method, the laboratory is required to repeat the procedures in Sections 9.2.2 and 10 to demonstrate continued method performance. If the detection limit of the method will be affected by the modification, the laboratory should demonstrate that the MDL (40 CFR

136, appendix B) is less than or equal to the MDL in this method or one-third the regulatory compliance level, whichever is higher.

9.1.3 The laboratory shall spike 10% of the samples with known concentrations of 2,4,6-trichlorophenol to monitor method performance and matrix interferences (interferences caused by the sample matrix). This test is described in Section 9.3. When results of these spikes indicate atypical method performance for samples, the samples are diluted to bring method performance within acceptable limits.

9.1.4 Analyses of blanks are required to demonstrate freedom from contamination. The procedures and criteria for analysis of blanks are described in Section 9.4.

9.1.5 The laboratory shall, on an ongoing basis, demonstrate through the analysis of the precision and recovery (PAR) standard that the analysis system is in control. These procedures are described in Section 9.10.

9.1.6 The laboratory shall perform quality control tests on the granular activated carbon. These procedures are described in Section 9.5.

9.1.7 Samples are analyzed in duplicate to demonstrate precision. These procedures are described in Section 9.6.

9.2 Initial demonstration of laboratory capability.

9.2.1 Method Detection Limit (MDL): To establish the ability to detect AOX, the laboratory should determine the MDL per the procedure in 40 CFR 136, appendix B using the apparatus, reagents, and standards that will be used in the practice of this method. An MDL less than or equal to the MDL in Section 1.3 should be achieved prior to the practice of this method.

9.2.2 Initial precision and recovery (IPR): To establish the ability to generate acceptable precision and recovery, the laboratory shall perform the following operations:

9.2.2.1 Analyze four aliquots of the PAR standard (Section 7.12.4) and a method blank according to the procedures in Sections 9.4 and 11.

9.2.2.2 Using the blank-subtracted results of the set of four analyses, compute the average percent recovery (X) and the standard deviation of the percent recovery (s) for the results.

9.2.2.3 The average percent recovery shall be in the range of 81 to 114 μg/L and the standard deviation shall be less than 8 μg/L. If X and s meet these acceptance criteria, system performance is acceptable and analysis of blanks and samples may begin. If, however, s exceeds the precision limit or X falls outside the range for recovery, system performance is unacceptable. In this case, correct the problem and repeat the test.

9.3 Matrix spikes: The laboratory shall spike a minimum of 10% of samples from a given matrix type (e.g., C-stage filtrate, produced water, treated effluent) in duplicate (MS/MSD). If only one sample from a given matrix type is analyzed, an additional two aliquots of that sample shall be spiked.

9.3.1 The concentration of the analytes spiked into the MS/MSD shall be determined as follows:

9.3.1.1 If, as in compliance monitoring, the concentration of OX is being checked against a regulatory concentration limit, the spiking level shall be at that limit or at one to five times higher than the background concentration determined in Section 9.3.2, whichever concentration is higher.

9.3.1.2 If the concentration of OX is not being checked against a regulatory limit, the spike shall be at the concentration of the precision and recovery standard (PAR; Section 7.12.4) or at one to five times higher than the background concentration determined in Section 9.3.2, whichever concentration is higher.

9.3.2 Analyze one sample out of each batch of 10 samples from each site to determine the background concentration of AOX. If necessary, prepare a solution of 2,4,6-trichlorophenol appropriate to produce a level in the sample one to five times the background concentration. Spike two additional sample aliquots with spiking solution and analyze them to determine the concentration after spiking.

9.3.2.1 Compute the percent recovery of each analyte in each aliquot:

$$\%\ \text{Recovery} = \frac{100\ (\text{Found} - \text{Background})}{\text{T}}$$

where:

T is the true value of the spike

9.3.2.2 Compute the relative percent difference (RPD) between the two results (not between the two recoveries) as described in Section 12.4.

9.3.2.3 If the RPD is less than 20%, and the recoveries for the MS and MSD are within the range of 78 to 116%, the results are acceptable.

9.3.2.4 If the RPD is greater than 20%, analyze two aliquots of the precision and recovery standard (PAR).

9.3.2.4.1 If the RPD for the two aliquots of the PAR is greater than 20%, the analytical system is out of control. In this case, repair the problem and repeat the analysis of the sample batch, including the MS/MSD.

9.3.2.4.2 If, however, the RPD for the two aliquots of the PAR is less than 20%, dilute the sample chosen for the MS/MSD by a factor of 2–10 (to remain within the working range of the analytical system) and repeat the MS/MSD test. If the RPD is still greater than 20%, the result may not be reported for regulatory compliance purposes. In this case, choose another sample for the MS/MSD and repeat analysis of the sample batch.

9.3.2.5 If the percent recovery for both the MS and MSD are less than 78% or greater

than 116%, analyze the precision and recovery (PAR) standard.

9.3.2.5.1 If the recovery of the PAR is outside the 78 to 116% range, the analytical system is out of control. In this case, repair the problem and repeat the analysis of the sample batch, including the MS/MSD.

9.3.2.5.2 If the recovery of the PAR is within the range of 78 to 116%, dilute the sample, MS, and MSD by a factor of 2–10 (to remain within the working range of the analytical system) and re-analyze. If the results of the dilute analyses remain outside of the acceptable range, these results may not be reported for regulatory compliance purposes. In this case, choose another sample for the MS/MSD and repeat the analysis of the sample batch.

9.4 Blanks.

9.4.1 Reagent water blanks: Analyzed to demonstrate freedom from contamination.

9.4.1.1 Analyze a reagent water blank with each batch of samples. The blank must be analyzed immediately preceding calibration verification to allow for blank subtraction and to demonstrate freedom from contamination and memory effects, and must include all details of the procedure to be followed when analyzing samples.

9.4.1.2 Prepare the reagent water blank using a volume of reagent water equivalent to the volume used for sample preparation (Section 11.1). If using the micro-column procedure, adsorb the method blank using two columns, as described in Section 11. Combust the GAC from each column separately, as described in Section 11.

9.4.1.3 If the result from the blank from the batch method or the sum of the results from two columns is more than 20 μg/L, analysis of samples is halted until the source of contamination is eliminated and a blank shows no evidence of contamination at this level.

9.4.2 Nitrate-washed GAC blanks: Analyzed daily to demonstrate that the GAC is free from contamination.

9.4.2.1 Nitrate-washed GAC blank for the batch procedure: Analyze a batch nitrate-washed GAC blank by adding a scoop of dry GAC to the assembled filter apparatus containing the polycarbonate membrane and washing the GAC with the nitrate wash solution (Section 7.10) using the procedure in Section 11.2.6.

9.4.2.2 Nitrate-washed GAC blank for the column procedure: Analyze a column nitrate-washed GAC blank by assembling two carbon columns in series and washing the columns with the nitrate wash solution (Section 7.10) using the procedure in Section 11.3.4.2. Analyze the GAC in each column separately. The results of the second analysis must be within ±0.2 μg Cl^- of the first. A difference greater than 0.2 μg Cl^- indicates a lack of homogeneity in the GAC that could introduce unacceptable variability. If the difference exceeds this amount, the GAC should be replaced.

9.4.3 The result for the reagent water blank (Section 9.4.1) shall not exceed the result for the nitrate wash blank (Section 9.4.2.1 or 9.4.2.2) by more than 0.5 μg Cl^-.

9.5 Granular activated carbon (GAC) batch testing: Each lot number or batch of activated carbon received from a supplier is tested once before use to ensure adequate quality. Use only GAC that meets the test criteria below.

9.5.1 Contamination test: Analyze a scoop of GAC. Reject carbon if the amount of OX exceeds 1 μg (25 μg Cl^-/g).

9.5.2 Inorganic chloride adsorption test: Attempt to adsorb NaCl from 100 mL of a solution containing 100 mg/L in reagent water. Wash with nitrate solution and analyze. The amount of halide should be less than 1 μg Cl^- larger than the blank. A larger amount indicates significant uptake of inorganic chloride by the carbon. Reject carbon if the 1 μg level is exceeded.

9.6 Samples that are being used for regulatory compliance purposes shall be analyzed in duplicate.

9.6.1 The procedure for preparing duplicate sample aliquots is described in Section 11.5.

9.6.2 Calculate the RPD by following the same procedure described in Section 12.4.

9.6.3 If the RPD is greater than 20%, the analyses must be repeated.

9.6.4 If the RPD remains greater than 20%, the result may not be reported for regulatory compliance purposes.

9.7 The specifications in this method can be met if the apparatus used is calibrated properly and maintained in a calibrated state. The standards used for calibration (Section 10), calibration verification (Section 9.9), and for initial (Section 9.2.2) and ongoing (Section 9.10) precision and recovery should be identical, so that the most precise results will be obtained.

9.8 Depending on specific program requirements, field duplicates may be collected to determine the precision of the sampling technique.

9.9 At the beginning and end of each eight-hour shift during which analyses are performed, system performance and calibration are verified. Verification of system performance and calibration may be performed more frequently, if desired.

9.9.1 If performance and calibration are verified at the beginning and end of each shift (or more frequently), samples analyzed during that period are considered valid.

9.9.2 If performance and calibration are not verified at both the beginning and end of a shift (or more frequently), samples analyzed during that period must be reanalyzed.

9.9.3 If calibration is verified at the beginning of a shift, recalibration using the five standards described in Section 10.6 is not

necessary; otherwise, the instrument must be recalibrated prior to analyzing samples (Section 10).

9.9.4 Cell maintenance and other changes to the analytical system that can affect system performance may not be performed during the eight-hour (or shorter) shift.

9.10 Calibration verification and ongoing precision and recovery: Calibration and system performance are verified by the analysis of the 100 μg/L PAR standard.

9.10.1 Analyze a blank (Section 9.4) and analyze the PAR standard (Section 7.12.4) immediately thereafter at the beginning and end of each shift. Compute the concentration of organic halide in the blank and in the PAR standard using the procedures in Section 12. The blank shall be less than 2 μg Cl^- (20 μg/L equivalent).

9.10.2 Subtract the result for the blank from the result of the PAR standard using the procedures in Section 12, and compute the percent recovery of the blank-subtracted PAR standard. The percent recovery shall be in the range of 78 to 116%.

9.10.3 If the recovery is within this range, the analytical process is in control and analysis of blanks and samples may proceed. If, however, the recovery is not within the acceptable range, the analytical process is not in control. In this event, correct the problem and repeat the ongoing precision and recovery test (Section 9.10), or recalibrate (Sections 10.5 through 10.6).

9.10.4 If the recovery is not within the acceptable range for the PAR standard analyzed at the end of the eight-hour shift, correct the problem, repeat the ongoing precision and recovery test (Section 9.10), or recalibrate (Sections 10.5 through 10.6), and reanalyze the sample batch that was analyzed during the eight-hour shift.

9.10.5 If the recovery is within the acceptable range at the end of the shift, and samples are to be analyzed during the next eight-hour shift, the end of shift verification may be used as the beginning of shift verification for the subsequent shift, provided the next eight-hour shift begins as the first shift ends.

9.11 It is suggested but not required that the laboratory develop a statement of data quality for AOX and develop QC charts to form a graphic demonstration of method performance. Add results that pass the specification in Section 9.10.2 to initial and previous ongoing data. Develop a statement of data quality by calculating the average percent recovery (R) and the standard deviation of percent recovery (s_r). Express the accuracy as a recovery interval from R $2s_r$ to R = $2s_r$. For example, if R = 95% and s_r = 5%, the accuracy is 85 to 105%.

10.0 Calibration and Standardization

10.1 Assemble the OX system and establish the operating conditions necessary for analysis. Differences between various makes and models of instruments will require different operating procedures. Laboratories should follow the operating instructions provided by the manufacturer of their particular instrument. Sensitivity, instrument detection limit, precision, linear range, and interference effects must be investigated and established for each particular instrument. Calibration is performed when the instrument is first set up and when calibration cannot be verified (Section 9.9).

10.2 Cell performance test: Inject 100 μL of the sodium chloride solution (10 μg Cl^-; Section 7.4) directly into the titration cell electrolyte. Adjust the instrument to produce a reading of 10 μg Cl^-.

10.3 Combustion system test: This test can be used to assure that the combustion/micro-coulometer systems are performing properly without introduction of carbon. This test should be used during initial instrument setup and when instrument performance indicates a problem with the combustion system.

10.3.1 Designate a quartz boat for use with the ammonium chloride (NH_4Cl) solution only.

10.3.2 Inject 100 μL of the NH_4Cl solution (Section 7.5) into this boat and proceed with the analysis.

10.3.3 The result shall be between 9.5 and 10.5 μg Cl^-. If the recovery is not between these limits, the combustion or micro-coulometer systems are not performing properly. Check the temperature of the combustion system, verify that there are no leaks in the combustion system, confirm that the cell is performing properly (Section 10.2), and then repeat the test.

10.4 Trichlorophenol combustion test: This test can be used to assure that the combustion/micro-coulometer systems are performing properly when carbon is introduced. It should be used during instrument setup and when it is necessary to isolate the adsorption and combustion steps.

10.4.1 Inject 10 μL of the 1 mg/mL trichlorophenol stock solution (Section 7.12.2) onto one level scoop of GAC in a quartz boat.

10.4.2 Immediately proceed with the analysis to prevent loss of trichlorophenol and to prevent contamination of the carbon.

10.4.3 The result shall be between 9.0 and 11.0 μg Cl^-. If the recovery is not between these limits, the combustion/micro-coulometer system shall be adjusted and the test repeated until the result falls within these limits.

10.5 Background level of Cl^-: Determine the average background level of Cl^- for the entire analytical system as follows:

10.5.1 Using the procedure in Section 11 (batch or column) that will be used for the analysis of samples, determine the background level of Cl^- in each of three portions of reagent water. The volume of reagent

water used shall be the same as the volume used for analysis of samples.

10.5.2 Calculate the average (mean) concentration of Cl^- and the standard deviation of the concentration.

10.5.3 The sum of the average concentration plus two times the standard deviation of the concentration shall be less than 20 µg/L. If not, the water or carbon shall be replaced, or the adsorption system moved to an area free of organic halide vapors, and the test (Section 10.5) shall be repeated. Only after this test is passed may calibration proceed.

10.6 Calibration by external standard: A calibration line encompassing the calibration range is developed using solutions of 2,4,6-trichlorophenol.

10.6.1 Analyze each of the five calibration solutions (Section 7.12.3) using the procedure in Section 11 (batch or column) that will be used for the analysis of samples, and the same procedure that was used for determination of the system background (Section 10.5). Analyze these solutions beginning with the lowest concentration and proceeding to the highest. Record the response of the micro-coulometer to each calibration solution.

10.6.2 Prepare a method blank as described in Section 9.4. Subtract the value of the blank from each of the five calibration results, as described in Section 12.

10.6.3 Calibration factor (ratio of response to concentration) Using the blank subtracted results, compute the calibration factor at each calibration point, and compute the average calibration factor and the relative standard deviation (coefficient of variation; Cv) of the calibration factor over the calibration range.

10.6.4 Linearity: The Cv of the calibration factor shall be less than 20%; otherwise, the calibration shall be repeated after adjustment of the combustion/micro-coulometer system and/or preparation of fresh calibration standards.

10.6.5 Using the average calibration factor, compute the percent recovery at each calibration point. The recovery at each calibration point shall be within the range of 80 to 111%. If any point is not within this range, a fresh calibration standard shall be prepared for that point, this standard shall be analyzed, and the calibration factor (Section 10.6.3) and calibration linearity (Section 10.6.4) shall be computed using the new calibration point. All points used in the calibration must meet the 80 to 111% recovery specification.

11.0 Procedure

11.1 Sample dilution: Many samples will contain high concentrations of halide. If analyzed without dilution, the micro-coulometer can be overloaded, resulting in frequent cell cleaning and downtime. The following guidance is provided to assist in estimating dilution levels.

11.1.1 Paper and pulp mills that employ chlorine bleaching: Samples from pulp mills that use a chlorine bleaching process may overload the micro-coulometer. To prevent system overload, the maximum volume suggested for paper industry samples that employ halide in the bleaching process is 100 mL. An adsorption volume as small as 25 mL may be used, provided the concentration of AOX in the sample can be measured reliably, as defined by the requirements in Section 9.11. To minimize volumetric error, an adsorption volume less than 25 mL may not be used. If AOX cannot be measured reliably in a 100-mL sample volume, a sample volume to a maximum of 1000 mL must be used. The sample and adsorption volumes are suggested for paper industry samples employing chlorine compounds in the bleaching process:

Paper or pulp mill stream	Sample volume (mL)*	Adsorption volume (mL)
Evaporator condensate	100.0	100
Process water	100.0	100
Pulp mill effluent	30.0	50
Paper mill effluent	10.0	25
Combined mill effluent	5.0	25
Combined bleach effluent	1.0	25
C-stage filtrate	0.5	25
E-stage filtrate	0.5	25

*Assumes dilution to final volume of 100 mL. All sample aliquots (replicates, diluted samples) must be analyzed using the same fixed final volume (sample volume plus reagent water, as needed).

11.1.2 Sample dilution procedure.

11.1.2.1 Partially fill a precleaned volumetric flask with pH <2 reagent water, allowing for the volume of sample to be added.

11.1.2.2 Mix sample thoroughly by tumbling or shaking vigorously.

11.1.2.3 Immediately withdraw the required sample aliquot using a pipet or micro-syringe.

NOTE: Because it will be necessary to rinse the pipet or micro-syringe (Section 11.1.2.5), it may be necessary to pre-calibrate the

pipet or micro-syringe to assure that the exact volume desired will be delivered.

11.1.2.4 Dispense or inject the aliquot into the volumetric flask.

11.1.2.5 Rinse the pipet or syringe with small portions of reagent water and add to the flask.

11.1.2.6 Dilute to the mark with pH <2 reagent water.

11.1.3 All samples to be reported for regulatory compliance monitoring purposes must be analyzed in duplicate, as described in Section 11.5.

11.1.4 Pulp and Paper in-process samples: The concentration of organic halide in in-process samples has been shown to be 20 to 30% greater using the micro-column adsorption technique than using the batch adsorption technique. For this reason, the micro-column technique shall be used for monitoring in-process samples. Examples of in-process samples include: combined bleach plant effluent, C-stage filtrate, and E-stage filtrate.

11.2 Batch adsorption and filtration.

11.2.1 Place the appropriate volume of sample (diluted if necessary), preserved as described in Section 8, into an Erlenmeyer flask.

11.2.2 Add 5 mL of nitrate stock solution to the sample aliquot.

11.2.3 Add one level scoop of activated carbon that has passed the quality control tests in Section 9.

11.2.4 Shake the suspension for at least one hour in a mechanical shaker.

11.2.5 Filter the suspension through a polycarbonate membrane filter. Filter by suction until the liquid level reaches the top of the carbon.

11.2.6 Wash the inside surface of the filter funnel with 25 mL (±5 mL) of nitrate wash solution in several portions. After the level of the final wash reaches the top of the GAC, filter by suction until the cake is barely dry. The time required for drying should be minimized to prevent exposure of the GAC to halogen vapors in the air, but should be sufficient to permit drying of the cake so that excess water is not introduced into the combustion apparatus. A drying time of approximately 10 seconds under vacuum has been shown to be effective for this operation.

11.2.7 Carefully remove the top of the filter holder, making sure that no carbon is lost. This operation is most successfully performed by removing the clamp, tilting the top of the filter holder (the funnel portion) to one side, and lifting upward.

11.2.8 Using a squeeze bottle or micro-syringe, rapidly rinse the carbon from the inside of the filter holder onto the filter cake using small portions of wash solution. Allow the cake to dry under vacuum for no more than 10 seconds after the final rinse. Immediately turn the vacuum off.

11.2.9 Using tweezers, carefully fold the polycarbonate filter in half, then in fourths, making sure that no carbon is lost.

11.3 Column adsorption.

11.3.1 Column preparation: Prepare a sufficient number of columns for one day's operation as follows:

11.3.1.1 In a glove box or area free from halide vapors, place a plug of Cerafelt into the end of a clean glass column.

11.3.1.2 Fill the glass column with one level scoop (approximately 40 mg) of granular activated carbon that has passed the quality control tests in Section 9.

11.3.1.3 Insert a Cerafelt plug into the open end of the column to hold the carbon in place.

11.3.1.4 Store the columns in a glass jar with PTFE lined screw-cap to prevent infiltration of halide vapors from the air.

11.3.2 Column setup.

11.3.2.1 Install two columns in series in the adsorption module.

11.3.2.2 If the sample is known or expected to contain particulates that could prevent free flow of sample through the micro-columns, a Cerafelt plug is placed in the tubing ahead of the columns. If a measurement of the OX content of the particulates is desired, the Cerafelt plug can be washed with nitrate solution, placed in a combustion boat, and processed as a separate sample.

11.3.3 Adjusting sample flow rate: Because the flow rate used to load the sample onto the columns can affect the ability of the GAC to adsorb organic halides, the flow rate of the method blank is measured, and the gas pressure used to process samples is adjusted accordingly. The flow rate of the blank, which is composed of acidified reagent water and contains no particulate matter, should be greater than the flow rate of any sample containing even small amounts of particulate matter.

11.3.3.1 Fill the sample reservoir with the volume of reagent water chosen for the analysis (Section 9.4.1.2) that has been preserved and acidified as described in Section 8. Cap the reservoir.

11.3.3.2 Adjust the gas pressure per the manufacturer's instructions. Record the time required for the entire volume of reagent water to pass through both columns. The flow rate must not exceed 3 mL/min over the duration of the time required to adsorb the volume. If this flow rate is exceeded, adjust gas pressure, prepare another blank, and repeat the adsorption.

11.3.3.3 Once the flow rate for the blank has been established, the same adsorption conditions must be applied to all subsequent samples during that eight-hour shift, or until another method blank is processed, whichever comes first. To aid in overcoming breakthrough problems, a lower gas pressure (and, therefore, flow rate) may be used for

processing of samples, if desired. If the sample adsorption unit is disassembled or cleaned, the flow rate must be checked before processing additional samples.

11.3.3.4 Elute the pair of columns with 2 mL of nitrate wash solution. The flow rate of nitrate wash solution must not exceed 3 mL/min.

11.3.3.5 Separate the columns and mark for subsequent analysis.

11.3.4 The adsorption of sample volumes is performed in a similar fashion. Fill the sample reservoir with the sample volume chosen for the analysis (Section 11.1), that has been preserved as described in Section 8. All analyses must be performed with this volume (sample volume plus reagent water, as needed) in order to maintain a flow rate no greater than that determined for the blank (see Section 11.3.3).

11.3.4.1 Use the same gas pressure for sample adsorption as is used for the blank.

11.3.4.2 Elute the columns with 2 mL of the nitrate wash solution.

11.3.4.3 Separate the columns and mark for subsequent analysis.

11.3.5 If it is desirable to make measurements at levels lower than can be achieved with the sample volume chosen, or if the instrument response of an undiluted sample is less than three times the instrument response of the blank (Section 12.6.3), a larger sample volume must be used.

11.4 Combustion and titration.

11.4.1 Polycarbonate filter and GAC from batch adsorption.

11.4.1.1 Place the folded polycarbonate filter containing the GAC in a quartz combustion boat, close the airlock, and proceed with the automated sequence.

11.4.1.2 Record the signal from the microcoulometer for a minimum integration time of 10 minutes and determine the concentration of Cl^- from calibration data, per Section 12.

11.4.2 Columns from column adsorption.

11.4.2.1 Using the push rod, push the carbon and the Cerafelt plug(s) from the first column into a combustion boat. Proceed with the automated sequence.

11.4.2.2 Record the signal from the microcoulometer for a minimum integration time of 10 minutes and determine the concentration of Cl^- for the first column from calibration data, per Section 12.

11.4.2.3 Repeat the automated sequence with the second column.

11.4.2.4 Determine the extent of breakthrough of organic halides from the first column to the second column, as described in Section 12.

11.4.3 The two columns that are used for the method blank must be combusted separately, as is done for samples. 11.5 Duplicate sample analysis: All samples to be reported for regulatory compliance purposes must be analyzed in duplicate. This requirement applies to both the batch and column adsorption procedures. In addition, if it is necessary to dilute the sample for the purposes of reducing breakthrough or maintaining the concentration within the calibration range, a more or less dilute sample must be analyzed. The adsorption volumes used for analysis of undiluted samples, diluted samples, and all replicates must be the same as the volume used for QC tests and calibration (Sections 9 and 10).

11.5.1 Using results from analysis of one sample volume (Section 11.4) and the procedure in Section 11.1.2, determine if the dilution used was within the calibration range of the instrument and/or if breakthrough exceeded the specification in Section 12.3.1. If the breakthrough criterion was exceeded or the sample was not within the calibration range, adjust the dilution volume as needed. If the breakthrough criterion was not exceeded and the sample dilution was within the calibration range, a second volume at the same dilution level may be used.

11.5.2 Adsorb the sample using the same technique (batch or column) used for the first sample volume. Combust the GAC from the second volume as described in Section 11.4, and calculate the results as described in Section 12. Compare the results of the two analyses as described in Section 12.4.

11.5.3 Duplicate analyses are not required for method blanks, as different dilution levels are not possible.

11.5.4 Duplicate analyses of the PAR standard used for calibration verification (Section 9.10) are not required.

12.0 Data Analysis and Calculations

12.1 Batch Adsorption Method: Calculate the blank-subtracted concentration of adsorbable organic halide detected in each sample (in micrograms of chloride per liter) using the following equation:

$$\mathrm{AOX}(\mu\mathrm{g/L}) = \frac{(C - B)}{V}$$

Where:

C=µg Cl^- from micro-coulometer for the sample

B=µg Cl^- from micro-coulometer for the reagent water blank (Section 9.4.1)

V = volume of sample in liters

This calculation is performed for each of the two dilution levels analyzed for each sample.

12.2 Column Adsorption Method: Calculate the blank-subtracted concentration of adsorbable organic halide detected in each sample (in micrograms of chloride per liter) using the following equation:

$$\mathrm{AOX}(\mu\mathrm{g/L}) = \frac{\left[\left(C_1 + C_2\right) - \left(B_1 + B_2\right)\right]}{V}$$

C_1=µg Cl^- from micro-coulometer for first column from the sample
C_2=µg Cl^- from micro-coulometer for second column from the sample
B_1=µg from micro-coulometer for first column from the reagent water blank (Section 9.4.1)
B_2=µg Cl^- from micro-coulometer for second column from the reagent water blank (Section 9.4.1)
V = volume of sample in liters

12.3 Percent breakthrough: For each sample analyzed by the column method, calculate the percent breakthrough of halide from the first column to the second column, using the following equation:

$$\%\,\mathrm{Breakthrough} = \frac{(C_2 - B_2)(100)}{\left[\left(C_1 - B_1\right) + \left(C_2 - B_2\right)\right]}$$

12.3.1 For samples to be reported for regulatory compliance purposes, the percent breakthrough must be less than or equal to 25% for both of the two analyses performed on each sample (see Section 11.5).

12.3.2 If the breakthrough exceeds 25%, dilute the affected sample further, maintaining the amount of halide at least three times higher than the level of blank, and reanalyze the sample. Ensure that the sample is also analyzed at a second level of dilution that is at least a factor of 2 different (and still higher than three times the blank).

12.4 Relative percent difference (RPD): Calculate the relative percent difference between the results of the two analyses of each sample, using the following equation:

$$\mathrm{RPD} = \frac{200\left|\left(\mathrm{AOX}_1 - \mathrm{AOX}_2\right)\right|}{\left[\left(\mathrm{AOX}_1 + \mathrm{AOX}_2\right)\right]}$$

12.5 High concentrations of AOX: If the amount of halide from either analysis exceeds the calibration range, dilute the sample and reanalyze, maintaining at least a factor of 2 difference in the dilution levels of the two portions of the sample used.

12.6 Low concentrations of AOX: The blank-subtracted final result from the batch procedure or the sum of the blank-subtracted results from the two carbon columns should be significantly above the level of the blank.

12.6.1 If the instrument response for a sample exceeds the instrument response for the blank by a factor of at least 3, the result is acceptable.

12.6.2 If the instrument response for a sample is less than three times the instrument response for the blank, and the sample has been diluted, analyze a less dilute aliquot of sample.

12.6.3 If the instrument response of an undiluted sample containing AOX above the minimum level is less than three times the instrument response for the blank, the result is suspect and may not be used for regulatory compliance purposes. In this case, find the cause of contamination, correct the problem, and reanalyze the sample under the corrected conditions.

12.7 Report results that meet all of the specifications in this method as the mean of the blank-subtracted values from Section 12.1 or 12.2 for the two analyses at different dilution levels, in µg/L of Cl^- (not as 2,4,6-trichlorophenol), to three significant figures. Report the RPD of the two analyses. For samples analyzed by the column procedure, also report the percent breakthrough.

13.0 Method Performance

The specifications contained in this method are based on data from a single laboratory and from a large-scale study of the pulp and paper industry.

14.0 Pollution Prevention

14.1 The solvents used in this method pose little threat to the environment when recycled and managed properly.

14.2 Standards should be prepared in volumes consistent with laboratory use to minimize the volume of expired standards to be disposed.

15.0 Waste Management

15.1 It is the laboratory's responsibility to comply with all federal, state, and local regulations governing waste management, particularly the hazardous waste identification rules and land disposal restrictions, and to protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Compliance with all sewage discharge permits and regulations is also required.

15.2 Samples preserved with HCl or H_2SO_4 to pH <2 are hazardous and must be neutralized before being disposed, or must be handled as hazardous waste. Acetic acid and silver acetate solutions resulting from cell flushing must be disposed of in accordance with all applicable federal, state, and local regulations.

15.3 For further information on waste management, consult ''The Waste Management Manual for Laboratory Personnel,'' and ''Less is Better: Laboratory Chemical Management for Waste Reduction,'' both available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street NW., Washington, DC 20036.

16.0 References

16.1 ''Total Organic Halide, Methods 450.1—Interim,'' Prepared by Stephen Billets and James J. Lichtenberg, USEPA, Office of Research and Development, Physical and Chemical Methods Branch, EMSL-Cincinnati, Cincinnati, OH 45268, EPA 600/4–81–056 (1981).

16.2 Method 9020, USEPA Office of Solid Waste, ''Test Methods for Evaluating Solid Waste, SW–846,'' Third Edition, 1987.

16.3 ''Determination of Adsorbable Organic Halogens (AOX),'' ''German Standard Methods for the Analysis of Water, Waste Water and Sludge—General Parameters of Effects and Substances,'' Deutsche Industrie Norm (DIN) Method 38 409, Part 14, DIN German Standards Institute, Beuth Verlag, Berlin, Germany (1987).

16.4 ''Water Quality: Determination of Adsorbable Organic Halogens (AOX),'' International Organization for Standard/Draft International Standardization (ISO/DIS) Method 9562 (1988).

16.5 ''Organically Bound Chlorine by the AOX Method,'' SCAN-W 9:89, Secretariat, Scandinavian Pulp, Paper and Board Testing Committee, Box 5604, S–11486, Stockholm, Sweden (1989).

16.6 Method 5320, ''Dissolved Organic Halogen,'' from ''Standard Methods for the Examination of Water and Wastewater,'' 5320, American Public Health Association, 1015 15th St. NW, Washington, DC 20005 (1989).

16.7 ''Canadian Standard Method for the Determination of Adsorbable Organic Halides (AOX) in Waters and Wastewaters,'' Environment Canada and The Canadian Pulp and Paper Association (1990).

16.8 40 CFR part 136, appendix B.

16.9 ''Working with Carcinogens,'' DHEW, PHS, CDC, NIOSH, Publication 77–206, (Aug 1977).

16.10 ''OSHA Safety and Health Standards, General Industry'' OSHA 2206, 29 CFR 1910 (Jan 1976).

16.11 ''Safety in Academic Chemistry Laboratories,'' ACS Committee on Chemical Safety (1979).

16.12 ''Methods 330.4 and 330.5 for Total Residual Chlorine,'' USEPA, EMSL-Cincinnati, Cincinnati, OH 45268, EPA–4–79–020 (March 1979).

16.13 ''Validation of Method 1650: Determination of Organic Halide,'' Analytical Technologies Inc., ERCE Contract 87–3410, November 15, 1990. Available from the EPA Sample Control Center, DynCorp, 300 N. Lee St., Alexandria, VA 22314 (703–519–1140).

17.0 Figures

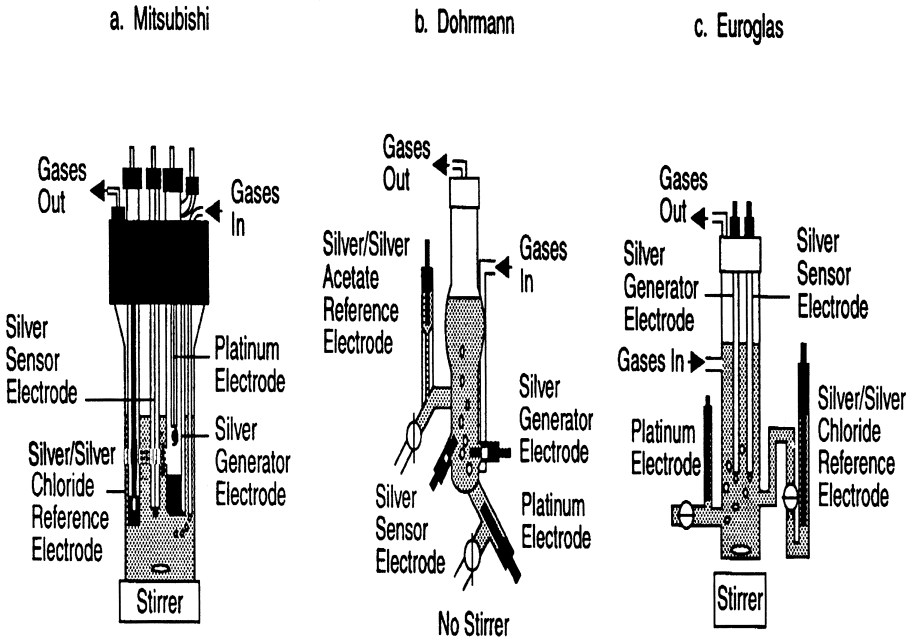


Figure 1. Microcoulometric Titration Cells (from Reference 7)

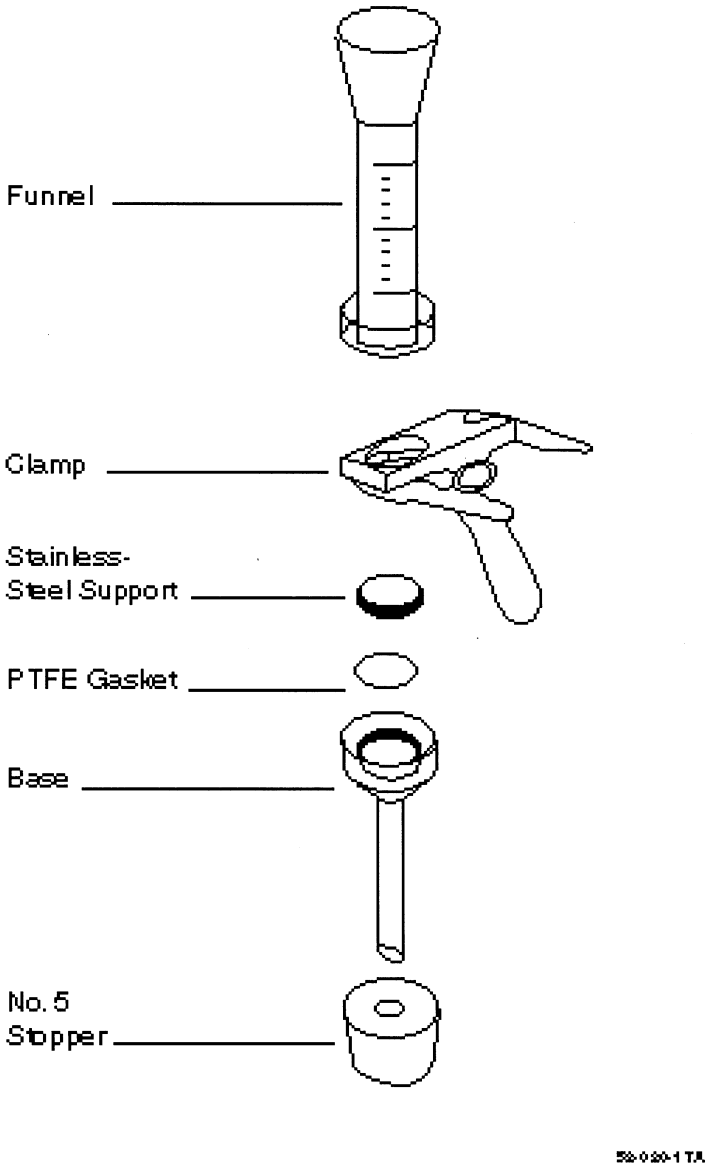


Figure 2. Filter Apparatus

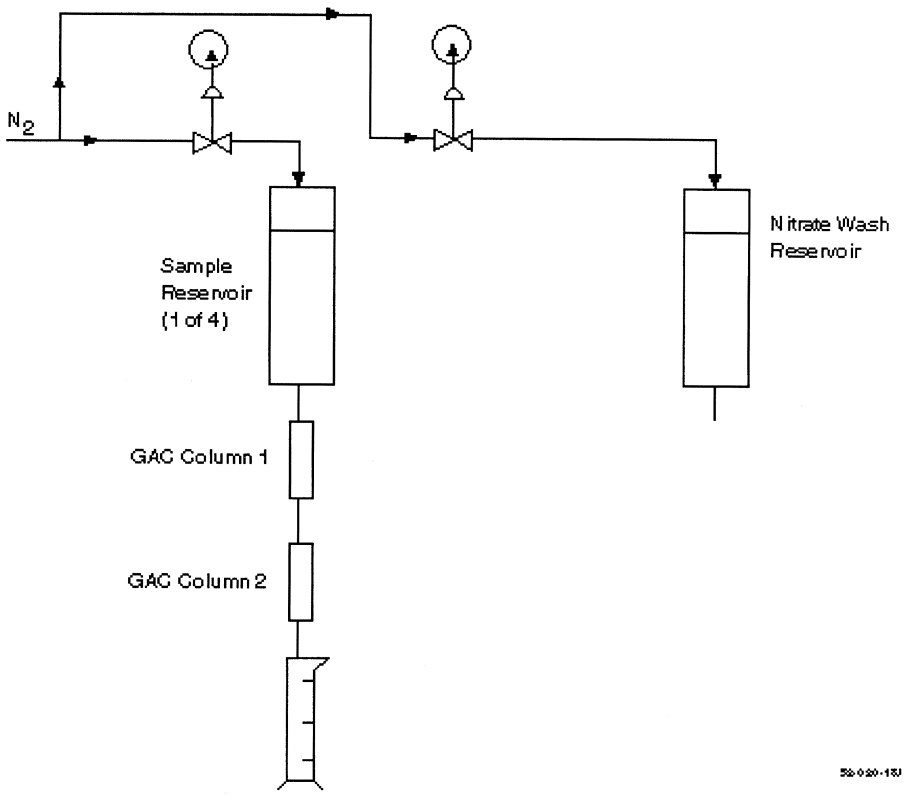
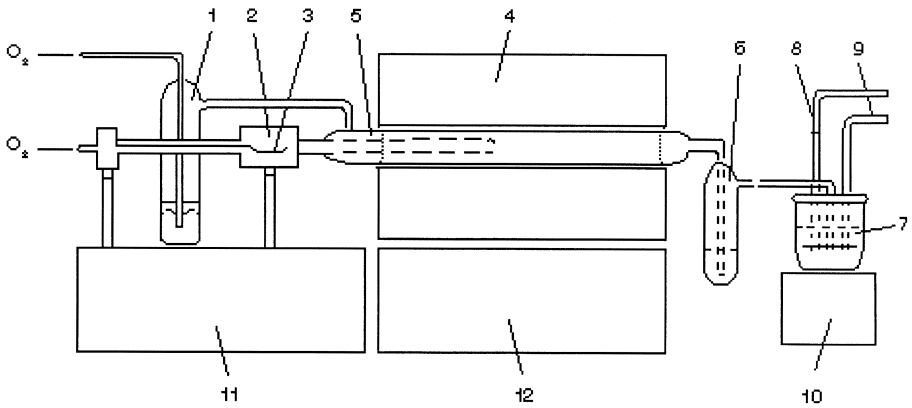


Figure3. Schematic of the Column Adsorption System



1. Stripping Device
2. Sample inlet for AOX
3. AOX Sample
4. Furnace
5. Combustion Tube
6. Absorber filled with H_2SO_4
7. Titration cell
8. Working electrodes
9. Measuring electrodes
10. Stirrer
11. Titration micro-processor
12. Gas flow and temperature control device

Figure 4. Schematic of an AOX Apparatus

18.0 Glossary of Definitions and Purposes

These definitions and purposes are specific to this method but have been conformed to common usage as much as possible.

18.1 Units of weight and measure and their abbreviations.

18.1.1 Symbols.

°C degrees Celsius
µg microgram
µL microliter
< less than
> greater than
% percent

18.1.2 Alphabetical characters.

cm centimeter
g gram
h hour
ID inside diameter
in inch
L liter
m meter
mg milligram
min minute
mL milliliter
mm millimeter

N normal; gram molecular weight of solute divided by hydrogen equivalent of solute, per liter of solution
OD outside diameter
ppb part-per-billion
ppm part-per-million
ppt part-per-trillion
psig pounds-per-square inch gauge
v/v volume per unit volume
w/v weight per unit volume

18.2 Definitions and acronyms (in alphabetical order).

Analyte: AOX tested for by this method.

Calibration standard (CAL): A solution prepared from a secondary standard and/or stock solution which is used to calibrate the response of the instrument with respect to analyte concentration.

Calibration verification standard (VER): The mid-point calibration standard (CS3) that is used to verify calibration.

Field blank: An aliquot of reagent water or other reference matrix that is placed in a sample container in the laboratory or the field, and treated as a sample in all respects, including exposure to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the field blank is to determine if the field or sample transporting procedures and environments have contaminated the sample.

IPR: Initial precision and recovery; four aliquots of the diluted PAR standard analyzed to establish the ability to generate acceptable precision and accuracy. An IPR is performed prior to the first time this method is used and any time the method or instrumentation is modified.

Laboratory blank: See Method blank.

Laboratory control sample (LCS): See Ongoing precision and recovery sample (OPR).

Laboratory reagent blank: See Method blank.

May: This action, activity, or procedural step is neither required nor prohibited.

May not: This action, activity, or procedural step is prohibited.

Method blank: An aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The method blank is used to determine if analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.

Minimum level (ML): The level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Must: This action, activity, or procedural step is required.

OPR: Ongoing precision and recovery standard; a laboratory blank spiked with a known quantity of analyte. The OPR is analyzed exactly like a sample. Its purpose is to assure that the results produced by the laboratory remain within the limits specified in this method for precision and recovery.

PAR: Precision and recovery standard; secondary standard that is diluted and spiked to form the IPR and OPR.

Preparation blank: See Method blank.

Primary dilution standard: A solution containing the specified analytes that is purchased or prepared from stock solutions and diluted as needed to prepare calibration solutions and other solutions.

Quality control check sample (QCS): A sample containing all or a subset of the analytes at known concentrations. The QCS is obtained from a source external to the laboratory or is prepared from a source of standards different from the source of calibration standards. It is used to check laboratory performance with test materials prepared external to the normal preparation process.

Reagent water: Water demonstrated to be free from the analyte of interest and potentially interfering substances at the method detection limit for the analyte.

Relative standard deviation (RSD): The standard deviation multiplied by 100, divided by the mean.

RSD: See Relative standard deviation.

Should: This action, activity, or procedural step is suggested but not required.

Stock solution: A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science and Technology (NIST), or a source that will attest to the purity and authenticity of the reference material.

VER: See Calibration verification standard.

Method 1653—Chlorinated Phenolics in Wastewater by In Situ Acetylation and GCMS

1.0 Scope and Application

1.1 This method is for determination of chlorinated phenolics (chlorinated phenols, guaiacols, catechols, vanillins, syringaldehydes) and other compounds associated with the Clean Water Act; the Resource Conservation and Recovery Act; and the Comprehensive Environmental Response, Compensation, and Liability Act; and that are amenable to in situ acetylation, extraction, and analysis by capillary column gas chromatography/mass spectrometry (GCMS). This method is based on existing methods for determination of chlorophenolics in pulp and paper industry wastewaters (References 1 and 2).

1.2 The chemical compounds listed in Table 1 may be determined in waters and, specifically, in in-process streams and

wastewaters associated with the pulp and paper industry. The method is designed to meet the survey and monitoring requirements of the Environmental Protection Agency (EPA).

1.3 The detection limit of this method is usually dependent on the level of interferences rather than instrumental limitations. The method detection limits (MDLs) in Table 2 typify the minimum quantity that can be detected with no interferences present.

1.4 The GCMS portions of this method are for use only by persons experienced with GCMS or under the close supervision of such qualified persons. Laboratories unfamiliar with analyses of environmental samples by GCMS should run the performance tests in Reference 3 before beginning.

1.5 Any modification of the method beyond those expressly permitted is subject to the application and approval of alternative test procedures under 40 CFR parts 136.4 and 136.5.

2.0 Summary of Method

2.1 A 1000-mL aliquot of water is spiked with stable isotopically labeled analogs of the compounds of interest and an internal standard. The solution is adjusted to neutral pH, potassium carbonate buffer is added, and the pH is raised to 9–11.5. The chlorophenolics are converted in situ to acetates by the addition of acetic anhydride. After acetylation, the solution is extracted with hexane. The hexane is concentrated to a final volume of 0.5 mL, an instrument internal standard is added, and an aliquot of the concentrated extract is injected into the gas chromatograph (GC). The compounds are separated by GC and detected by a mass spectrometer (MS). The labeled compounds and internal standard serve to correct the variability of the analytical technique.

2.2 Identification of a pollutant (qualitative analysis) is performed by comparing the relative retention time and mass spectrum to that of an authentic standard. A compound is identified when its relative retention time and mass spectrum agree.

2.3 Quantitative analysis is performed in one of two ways by GCMS using extracted ion-current profile (EICP) areas: (1) For those compounds listed in Table 1 for which standards and labeled analogs are available, the GCMS system is calibrated and the compound concentration is determined using an isotope dilution technique; (2) for those compounds listed in Table 1 for which authentic standards but no labeled compounds are available, the GCMS system is calibrated and the compound concentration is determined using an internal standard technique.

2.4 Quality is assured through reproducible calibration and testing of the extraction and GCMS systems.

3.0 Definitions

3.1 Chlorinated phenolics are the chlorinated phenols, guaiacols, catechols, vanillins, syringaldehydes and other compounds amenable to in situ acetylation, extraction, and determination by GCMS using this method.

3.2 Definitions for other terms used in this method are given in the glossary at the end of the method (Section 20.0).

4.0 Interferences

4.1 Solvents, reagents, glassware, and other sample processing hardware may yield artifacts and/or elevated baselines, causing misinterpretation of chromatograms and spectra. All materials used in the analysis shall be demonstrated to be free from interferences under the conditions of analysis by running method blanks initially and with each sample batch (samples started through the extraction process on a given eight-hour shift, to a maximum of 20). Specific selection of reagents and purification of solvents by distillation in all-glass systems may be required. Glassware and, where possible, reagents are cleaned by using solvent rinse and baking at 450 °C for a minimum of one hour.

4.2 Interferences co-extracted from samples will vary considerably from source to source, depending on the diversity of the site being sampled. Industry experience suggests that high levels of non-chlorinated phenols may cause poor recovery of the compounds of interest, particularly in samples collected in the vicinity of a source of creosote, such as a wood-preserving plant (Reference 1).

4.3 The internal standard, 3,4,5-trichlorophenol, has been reported to be an anaerobic degradation product of 2,3,4,5-tetrachlorophenol and/or pentachlorophenol (Reference 1). When an interference with this or another compound occurs, labeled pentachlorophenol or another labeled compound may be used as an alternative internal standard; otherwise, the internal standards and reference compounds must be used as specified in this method.

4.4 Blank contamination by pentachlorophenol has been reported (Reference 1) to be traceable to potassium carbonate; it has also been reported that this contamination may be removed by baking overnight at 400 to 500 °C.

4.5 Catechols are susceptible to degradation by active sites on injection port liners and columns, and are subject to oxidation to the corresponding chloro-o-benzoquinones (Reference 2). A small amount of ascorbic acid may be added to samples to prevent auto-oxidation (Reference 2; also see Section 11.1.6). For pulp and paper industry samples, ascorbic acid may be added to treated effluent samples only.

5.0 Safety

5.1 The toxicity or carcinogenicity of each compound or reagent used in this method has not been precisely determined; however, each chemical compound should be treated as a potential health hazard. Exposure to these compounds should be reduced to the lowest possible level. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of materials safety data sheets (MSDSs) should be made available to all personnel involved in these analyses. Additional information on laboratory safety can be found in References 4 through 6.

5.2 Samples may contain high concentrations of toxic compounds, and should be handled with gloves and a hood opened to prevent exposure.

6.0 Equipment and Supplies

NOTE: Brand names, suppliers, and part numbers are for illustrative purposes only. No endorsement is implied. Equivalent performance may be achieved using apparatus and materials other than those specified here, but demonstration of equivalent performance that meets the requirements of this method is the responsibility of the laboratory.

6.1 Sampling equipment for discrete or composite sampling.

6.1.1 Sample bottles and caps.

6.1.1.1 Sample bottle: Amber glass, 1000-mL minimum, with screw-cap. If amber bottles are not available, samples shall be protected from light.

6.1.1.2 Bottle caps: Threaded to fit sample bottles. Caps shall be lined with PTFE.

6.1.1.3 Cleaning bottles: Detergent water wash, cap with aluminum foil, and bake at 450 °C for a minimum of one hour before use.

6.1.1.4 Cleaning liners: Detergent water wash, reagent water (Section 7.4) and solvent rinse, and bake at approximately 200 °C for a minimum of 1 hour prior to use.

6.1.1.5 Bottles and liners must be lot-certified to be free of chlorophenolics by running blanks according to this method. If blanks from bottles and/or liners without cleaning or with fewer cleaning steps show no detectable chlorophenolics, the bottle and liner cleaning steps that do not eliminate chlorophenolics may be omitted.

6.1.2 Compositing equipment: Automatic or manual compositing system incorporating glass containers cleaned per bottle cleaning procedure above. Sample containers are kept at 0 to 4 °C during sampling. Glass or PTFE tubing only shall be used. If the sampler uses a peristaltic pump, a minimum length of compressible silicone rubber tubing may be used in the pump only. Before use, the tubing shall be thoroughly rinsed with methanol, followed by repeated rinsing with reagent water (Section 7.4) to minimize sample contamination. An integrating flow meter is used to collect proportional composite samples.

6.2 Extraction apparatus.

6.2.1 Bottle or beaker: 1500-to 2000-mL capacity.

6.2.2 Separatory funnel: 500-to 2000-mL, glass, with PTFE stopcock.

6.2.3 Magnetic stirrer: Corning Model 320, or equivalent, with stirring bar.

6.3 Polyethylene gloves: For handling samples and extraction equipment (Fisher 11–394–110–B, or equivalent).

6.4 Graduated cylinders: 1000-mL, 100-mL, and 10-mL nominal.

6.5 Centrifuge: Capable of accepting 50-mL centrifuge tubes and achieving 3000 RPM.

6.5.1 Centrifuge tubes.

6.5.1.1 35-mL nominal, with PTFE-lined screw-cap.

6.5.1.2 15-mL nominal, conical graduated, with ground-glass stopper.

6.6 Concentration apparatus.

6.6.1 Kuderna-Danish (K-D) concentrator tube: 10-mL, graduated (Kontes K-570050–1025, or equivalent) with calibration verified. Ground-glass stopper (size 19/22 joint) is used to prevent evaporation of extracts.

6.6.2 Kuderna-Danish (K-D) evaporation flask: 1000-mL (Kontes K-570001–1000, or equivalent), attached to concentrator tube with springs (Kontes K-662750–0012).

6.6.3 Snyder column: Three-ball macro (Kontes K-503000–0232, or equivalent).

6.6.4 Snyder column: Two-ball micro (Kontes K-469002–0219, or equivalent).

6.6.5 Boiling chips: Approximately 10/40 mesh, extracted with methylene chloride and baked at 450 °C for a minimum of one hour.

6.6.6 Nitrogen evaporation apparatus: Equipped with a water bath controlled at 35 to 40 °C (N-Evap, Organomation Associates, Inc., South Berlin, MA, or equivalent), installed in a fume hood. This device may be used in place of the micro-Snyder column concentrator in Section 6.6.4 above.

6.7 Water bath: Heated, with concentric ring cover, capable of temperature control (±2 °C), installed in a fume hood.

6.8 Sample vials: Amber glass, 1- to 3-mL, with PTFE-lined screw-cap.

6.9 Balances.

6.9.1 Analytical: Capable of weighing 0.1 mg.

6.9.2 Top loading: Capable of weighing 10 mg.

6.10 pH meter.

6.11 Gas chromatograph: Shall have splitless or on-column injection port for capillary column, temperature program with 50 °C hold, and shall meet all of the performance specifications in Section 9.

6.12 Gas chromatographic column: 30 m (±5 m) × 0.25 mm (±0.02 mm) I.D. × 0.25 micron, 5% phenyl, 94% methyl, 1% vinyl silicone bonded-phase fused-silica capillary column (J & W DB–5, or equivalent).

6.13 Mass spectrometer: 70 eV electron impact ionization, shall repetitively scan from 42 to 450 amu in 0.95 to 1.00 second, and shall produce a unit resolution (valleys between m/z 441–442 less than 10% of the height of the 441 peak), background-corrected mass spectrum from 50 ng decafluorotriphenylphosphine (DFTPP) introduced through the GC inlet. The spectrum shall meet the mass-intensity criteria in Table 3 (Reference 7). The mass spectrometer shall be interfaced to the GC such that the end of the capillary column terminates within 1 cm of the ion source, but does not intercept the electron or ion beams. All portions of the column which connect the GC to the ion source shall remain at or above the column temperature during analysis to preclude condensation of less volatile compounds.

6.14 Data system: Shall collect and record MS data, store mass-intensity data in spectral libraries, process GCMS data, generate reports, and compute and record response factors.

6.14.1 Data acquisition: Mass spectra shall be collected continuously throughout the analysis and stored on a mass storage device.

6.14.2 Mass spectral libraries: User-created libraries containing mass spectra obtained from analysis of authentic standards shall be employed to reverse search GCMS runs for the compounds of interest (Section 10.2).

6.14.3 Data processing: The data system shall be used to search, locate, identify, and quantify the compounds of interest in each GCMS analysis. Software routines shall be employed to compute retention times, and to compute peak areas at the m/z's specified (Table 4). Displays of spectra, mass chromatograms, and library comparisons are required to verify results.

6.14.4 Response factors and multi-point calibrations: The data system shall be used to record and maintain lists of response factors (response ratios for isotope dilution) and multi-point calibration curves (Section 10). Computations of relative standard deviation (coefficient of variation) are used for testing calibration linearity. Statistics on initial (Section 9.3.2) and ongoing (Section 9.6) performance shall be computed and maintained.

7.0 Reagents and Standards

7.1 Reagents for adjusting sample pH.

7.1.1 Sodium hydroxide: Reagent grade, 6 N in reagent water.

7.1.2 Sulfuric acid: Reagent grade, 6 N in reagent water.

7.2 Reagents for sample preservation.

7.2.1 Sodium thiosulfate ($Na_2S_2O_3$) solution (1 N): Weigh 79 g $Na_2S_2O_3$ in a 1–L volumetric flask and dilute to the mark with reagent water.

7.2.2 Ascorbic acid solution: Prepare a solution of ascorbic acid in reagent water at a concentration of 0.1 g/mL. This solution must be prepared fresh on each day when derivatizations will be performed. Therefore, do not prepare more than will be used that day. (A 50-mL volume is sufficient for ten analyses).

7.3 Solvents: Hexane, acetone, and methanol. Distilled in glass (Burdick and Jackson, or equivalent).

7.4 Reagent water: Water in which the compounds of interest and interfering compounds are not detected by this method.

7.5 Reagents for derivatization.

7.5.1 Potassium carbonate (K_2CO_3).

7.5.1.1 Purification: Spread in a shallow baking dish, heat overnight at 400 to 500 °C.

7.5.1.2 Solution: Dissolve 150 g purified K_2CO_3 in 250 mL reagent water.

7.5.2 Acetic anhydride: Redistilled reagent grade.

7.6 Analytical standards.

7.6.1 Derivatization: Because the chlorinated phenolics are determined as their acetate derivatives after in situ acetylation, the method requires that the calibration standards be prepared by spiking the underivatized materials into reagent water and carrying the spiked reagent water aliquot through the entire derivatization and extraction procedure that is applied to the field samples.

7.6.2 Standard solutions: Purchased as solutions or mixtures with certification to their purity, concentration, and authenticity, or prepared from materials of known purity and composition. If chemical purity of a compound is 98% or greater, the weight may be used without correction to compute the concentration of the standard. When not being used, standards are stored in the dark at 20 to 10 °C in screw-capped vials with PTFE-lined lids. A mark is placed on the vial at the level of the solution so that solvent evaporation loss can be detected. The vials are brought to room temperature prior to use.

7.6.3 If the chemical purity of any standard does not meet the 98% requirement above, the laboratory must correct all calculations, calibrations, etc., for the difference in purity.

7.7 Preparation of stock solutions: Prepare chlorovanillins and chlorosyringaldehydes in acetone, as these compounds are subject to degradation in methanol. Prepare the remaining chlorophenolics in methanol. Prepare all standards per the steps below. Observe the safety precautions in Section 5.

7.7.1 Dissolve an appropriate amount of assayed reference material in a suitable solvent. For example, weigh 50 mg (±0.1 mg) of pentachlorophenol in a 10-mL ground-glass-

stoppered volumetric flask and fill to the mark with methanol. After the pentachlorophenol is completely dissolved, transfer the solution to a 15-mL vial with PTFE-lined cap.

7.7.2 Stock solutions should be checked for signs of degradation prior to the preparation of calibration or performance test standards and shall be replaced after six months, or sooner if comparison with quality control check standards indicates a change in concentration.

7.8 Labeled compound spiking solution: From stock solutions prepared as above, or from mixtures, prepare one spiking solution to contain the labeled chlorovanillin in acetone and a second spiking solution to contain the remaining chlorophenolics, including the 3,4,5-trichlorophenol sample matrix internal standard (SMIS), in methanol. The labeled compounds and SMIS are each at a concentration of 12.5 µg/mL.

7.9 Secondary standards for calibration: Using stock solutions (Section 7.7), prepare one secondary standard containing the chlorovanillins and chlorsyringaldehydes listed in Table 1 in acetone and a second secondary standard containing the remaining chlorophenolics in methanol. The monochlorinated phenol, guaiacol, and catechol are included at a concentration of 25 µg/mL; the trichlorinated catechols, tetrachlorinated guaiacol and catechol, pentachlorophenol, 5,6-dichlorovanillin, and 2,6-dichlorosyringaldehyde are included at a concentration of 100 µg/mL; and the remaining compounds are included at a concentration of 50 µg/mL, each in their respective solutions.

7.10 Instrument internal standard (IIS): Prepare a solution of 2,2′-difluorobiphenyl (DFB) at a concentration of 2.5 mg/mL in hexane.

7.11 DFTPP solution: Prepare a solution of DFTPP at 50 µg/mL in acetone.

7.12 Solutions for obtaining authentic mass spectra (Section 10.2): Prepare mixtures of compounds at concentrations which will assure authentic spectra are obtained for storage in libraries.

7.13 Preparation of calibration solutions.

7.13.1 Into five 1000-mL aliquots of reagent water, spike 50, 100, 200, 500 and 1000 µL of each of the two solutions in Section 7.9. Spike 1.00 mL of each of the two labeled compound spiking solutions (Section 7.8) into each of the five aliquots.

7.13.2 Using the procedure in Section 11, derivatize and extract each solution, and concentrate the extract to a final volume of 0.50 mL. This will produce calibration solutions of nominal 5, 10, 20, 50, and 100 µg/mL of the native chlorophenolics and a constant concentration of 25 µg/mL of each labeled compound and the SMIS (assuming 100% derivatization and recovery). As noted in Section 11.1.6, ascorbic acid is added to all samples of final effluents to stabilize chlorocatechols, but is not added to samples of pulp and paper in-process wastewaters. Therefore, it is necessary to prepare separate sets of five initial calibration standards with and without the addition of ascorbic acid. Also, in the event that the laboratory is extracting final effluent samples by both the stir-bar and separatory funnel procedures (see Section 11.3), initial calibration standards should be prepared by both methods.

7.13.3 These solutions permit the relative response (labeled to unlabeled) and the response factor to be measured as a function of concentration (Sections 10.4 and 10.5).

7.13.4 The nominal 50 µg/mL standard may also be used as a calibration verification standard (see Section 9.6).

7.14 Ongoing precision and recovery (OPR) standard: Used for determination of initial (Section 9.3.2) and ongoing (Section 9.6) precision and recovery. This solution is prepared by spiking 500 µL of each the two solutions of the secondary calibration standards (Section 7.9) and 1 mL of each of the two labeled compound spiking solutions (Section 7.8) into 1000 mL of reagent water.

7.15 Stability of solutions: All standard solutions (Sections 7.7 through 7.14) shall be analyzed within 48 hours of preparation and on a monthly basis thereafter for signs of degradation. Standards will remain acceptable if the peak area at the quantitation m/z relative to the DFB internal standard remains within ±15% of the area obtained in the initial analysis of the standard.

8.0 Sample Collection, Preservation, and Storage

8.1 Collect samples in glass containers (Section 6.1) following conventional sampling practices (Reference 9). Aqueous samples are collected in refrigerated bottles using automatic sampling equipment.

8.2 Sample preservation.

8.2.1 Residual chlorine: If the sample contains residual chlorine, the chlorine must be reduced to eliminate positive interference resulting from continued chlorination reactions. Immediately after sampling, test for residual chlorine using the following method or an alternative EPA method (Reference 10).

8.2.1.1 Dissolve a few crystals of potassium iodide in the sample and add three to five drops of a 1% starch solution. A blue color indicates the presence of residual chlorine.

8.2.1.2 If residual chlorine is found, add 1 mL of sodium thiosulfate solution (Section 7.2.1) for each 2.5 ppm of free chlorine or until the blue color disappears.

8.2.2 Acidification: Adjust pH of all aqueous samples to <2 with sulfuric acid (Section 7.1.2). Failure to acidify samples may result in positive interferences from continued chlorination reactions.

8.2.3 Refrigeration: Maintain sample temperature at 0 to 4 °C from time of collection until extraction, and maintain extracts at a temperature of 0 to 4 °C from time of extraction until analysis.

8.3 Collect a minimum of 2000 mL of sample. This will provide a sufficient amount for all testing. Smaller amounts may be collected if the stream is known to contain high levels of chlorophenolics.

8.4 All samples must be acetylated and extracted within 30 days of collection, and must be analyzed within 30 days of acetylation. If labeled compound recoveries for a sample do not meet the acceptance criteria in Table 5 and the 30-day holding time is not met, a new sample must be collected.

9.0 Quality Control

9.1 Each laboratory that uses this method is required to operate a formal quality assurance program (Reference 8). The minimum requirements of this program consist of an initial demonstration of laboratory capability, analysis of samples spiked with labeled compounds to evaluate and document data quality, and analysis of standards and blanks as tests of continued performance. Laboratory performance is compared to established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1.1 DFTPP spectrum validity shall be checked at the beginning of each eight-hour shift during which analyses are performed. This test is described in Section 9.2.

9.1.2 The laboratory shall make an initial demonstration of the ability to generate acceptable results with this method. This ability is established as described in Section 9.3.

9.1.3 The laboratory is permitted to modify this method to improve separations or lower the costs of measurements, provided all performance specifications are met. Each time a modification is made to the method, the laboratory is required to repeat the procedures in Sections 10.3 and 9.3.2 to demonstrate method performance. If the detection limits for the analytes in this method will be affected by the modification, the laboratory should demonstrate that each MDL (40 CFR 136, appendix B) is less than or equal to the MDL in this method or one-third the regulatory compliance level, whichever is higher.

9.1.4 The laboratory shall spike all samples with labeled compounds and the sample matrix internal standard (SMIS) to monitor method performance. This test is described in Section 9.4. When results of these spikes indicate atypical method performance for samples, the samples are diluted to bring method performance within acceptable limits (Section 13).

9.1.5 Analyses of blanks are required to demonstrate freedom from contamination. The procedures and criteria for analysis of a blank are described in Section 9.5.

9.1.6 The laboratory shall, on an ongoing basis, demonstrate through analysis of the ongoing precision and recovery standard (Section 7.14) that the analysis system is in control. These procedures are described in Section 9.6.

9.1.7 The laboratory shall maintain records to define the quality of data that is generated. Development of accuracy statements is described in Section 9.4.4 and 9.6.3.

9.2 DFTPP spectrum validity: Inject 1 μL of the DFTPP solution (Section 7.11) either separately or within a few seconds of injection of the OPR standard (Section 9.6) analyzed at the beginning of each shift. The criteria in Table 3 shall be met.

9.3 Initial demonstration of laboratory capability.

9.3.1 Method Detection Limit (MDL): To establish the ability to detect the analytes in this method, the laboratory should determine the MDL per the procedure in 40 CFR 136, appendix B using the apparatus, reagents, and standards that will be used in the practice of this method. MDLs less than or equal to the MDLs in Table 2 should be achieved prior to the practice of this method.

9.3.2 Initial precision and recovery (IPR): To establish the ability to demonstrate control over the analysis system and to generate acceptable precision and accuracy, the laboratory shall perform the following operations:

9.3.2.1 Derivatize, extract, concentrate, and analyze four 1000-mL aliquots of the ongoing precision and recovery standard (OPR; Section 7.14), according to the procedure in Section 11. Separate sets of IPR aliquots must be prepared with the addition of ascorbic acid and without.

9.3.2.2 Using results of the four analyses, compute the average percent recovery (X) and the relative standard deviation of the recovery (s) for each compound, by isotope dilution for pollutants with a labeled analog, and by internal standard for pollutants with no labeled analog and for the labeled compounds and the SMIS.

9.3.2.3 For each compound, compare s and X with the corresponding limits for initial precision and recovery in Table 5. If s and X for all compounds meet the acceptance criteria, system performance is acceptable and analysis of blanks and samples may begin. If, however, any individual s exceeds the precision limit or any individual X falls outside the range for recovery, system performance is unacceptable for that compound. In this event, correct the problem and repeat the test (Section 9.3.2).

9.4 Labeled compound recovery: The laboratory shall spike all samples with labeled compounds and the sample matrix internal

standard (SMIS) to assess method performance on the sample matrix.

9.4.1 Analyze each sample according to the method beginning in Section 11.

9.4.2 Compute the percent recovery (P) of the labeled compounds and the SMIS using the internal standard method (Section 14.3) with 2,2′-difluorobiphenyl as the reference compound.

9.4.3 Compare the labeled compound and SMIS recovery for each compound with the corresponding limits in Table 5. If the recovery of any compound falls outside its warning limit, method performance is unacceptable for that compound in that sample. Therefore, the sample is complex. The sample is diluted and reanalyzed per Section 13.

9.4.4 As part of the QA program for the laboratory, it is suggested, but not required, that method accuracy for samples be assessed and records maintained. After the analysis of five samples for which the labeled compounds pass the tests in Section 9.4.3, compute the average percent recovery (P) and the standard deviation of the percent recovery (sp) for the labeled compounds only. Express the accuracy assessment as a percent recovery interval from P 2sp to P = 2sp for each matrix. For example, if P = 90% and sp = 10%, the accuracy interval is expressed as 70 to 110%. Update the accuracy assessment for each compound on a regular basis (e.g., after each 20 to 30 new accuracy measurements).

9.5 Blanks: Reagent water blanks are analyzed to demonstrate freedom from contamination.

9.5.1 Extract and concentrate a 1000-mL reagent water blank with each sample batch (samples started through the extraction process on the same eight-hour shift, to a maximum of 20 samples). Blanks associated with samples to which ascorbic acid is added must be prepared with ascorbic acid, and blanks associated with samples to which ascorbic acid is not added must be prepared without ascorbic acid. Analyze the blank immediately after analysis of the OPR (Section 7.14) to demonstrate freedom from contamination.

9.5.2 If any of the compounds of interest (Table 1) or any potentially interfering compound is found in an aqueous blank at greater than 5 µg/L (assuming a response factor of one relative to the sample matrix internal standard for compounds not listed in Table 1), analysis of samples is halted until the source of contamination is eliminated and a blank shows no evidence of contamination at this level.

9.6 Calibration verification and ongoing precision and recovery: At the beginning of each eight-hour shift during which analyses are performed, analytical system performance is verified for all compounds. Analysis of DFTPP (Section 9.2) and the nominal 50 µg/mL OPR (Section 11.1.5) is used to verify all performance criteria. Adjustment and/or recalibration, per Section 10, shall be performed until all performance criteria are met. Only after all performance criteria are met may samples and blanks be analyzed.

9.6.1 Analyze the extract of the OPR (Section 11.1.5) at the beginning of each eight-hour shift and prior to analysis of samples from the same batch. Alternatively, a separate calibration verification may be performed using an aliquot of the midpoint calibration standard from Section 7.13 (with a nominal concentration of 50 µg/mL). This alternative may be used to check instrument performance on failure of an OPR, or when samples extracted with an OPR aliquot are not analyzed within the same eight-hour analysis shift.

9.6.1.1 Retention times: The absolute retention time of 2,2′-difluorobiphenyl shall be within the range of 765 to 885 seconds, and the relative retention times of all pollutants and labeled compounds shall fall within the limits given in Table 2.

9.6.1.2 GC resolution: The valley height between 4,6-dichloroguaiacol and 3,4-dichloroguaiacol at m/z 192 shall not exceed 10% of the height of the taller of the two peaks.

9.6.1.3 Multiple peaks: Each compound injected shall give a single, distinct GC peak.

9.6.2 Compute the percent recovery of each pollutant (Table 1) by isotope dilution (Section 10.4) for those compounds that have labeled analogs. Compute the percent recovery of each pollutant that has no labeled analog by the internal standard method (Section 10.5), using the 3,4,5-trichlorophenol (SMIS) as the internal standard. Compute the percent recovery of the labeled compounds and the SMIS by the internal standard method, using the 2,2′-difluorobiphenyl as the internal standard.

9.6.2.1 For each compound, compare the recovery with the limits for ongoing precision and recovery in Table 5. If all compounds meet the acceptance criteria, system performance is acceptable and analysis of blanks and samples may proceed. If, however, any individual recovery falls outside of the range given, system performance is unacceptable for that compound. In this event, there may be a problem with the GCMS or with the derivatization/extraction/concentration systems.

9.6.2.2 GCMS system: To determine if the failure of the OPR test (Section 9.6.2.1) is due to instrument drift, analyze the current calibration verification extract (Section 7.13.4), calculate the percent recoveries of all compounds, and compare with the OPR recovery limits in Table 5. If all compounds meet these criteria, GCMS performance/stability is verified, and the failure of the OPR analysis is attributed to problems in the derivatization/extraction/concentration of the OPR. In this case, analysis of the sample

extracts may proceed. However, failure of any of the recovery criteria in the analysis of a sample extract requires rederivatization of that sample (Sections 13.3.1 and 13.3.2). If, however, the performance/stability of the GCMS is not verified by analysis of the calibration verification extract, the GCMS requires recalibration and all extracts associated with the failed OPR must be reanalyzed.

9.6.3 Add results that pass the specifications in Section 9.6.2.1 to initial and previous ongoing data for each compound. Update QC charts to form a graphic representation of continued laboratory performance. Develop a statement of laboratory accuracy for each pollutant and labeled compound in each matrix type (reagent water, C-stage filtrate, E-stage filtrate, final effluent, etc.) by calculating the average percent recovery (R) and the standard deviation of percent recovery (sr). Express the accuracy as a recovery interval from R 2sr to R = 2sr. For example, if R = 95% and sr = 5%, the accuracy is 85 to 105%.

9.7 The specifications contained in this method can be met if the apparatus used is calibrated properly, then maintained in a calibrated state. The standards used for calibration (Section 10) and for initial (Section 9.3.2) and ongoing (Section 9.6) precision and recovery should be identical, so that the most precise results will be obtained. The GCMS instrument in particular will provide the most reproducible results if dedicated to the settings and conditions required for the analyses of chlorophenolics by this method.

9.8 Depending on specific program requirements, field replicates may be collected to determine the precision of the sampling technique, and spiked samples may be required to determine the accuracy of the analysis when the internal standard method is used.

10.0 Calibration and Standardization

10.1 Assemble the GCMS and establish the operating conditions in Section 12. Analyze standards per the procedure in Section 12 to demonstrate that the analytical system meets the minimum levels in Table 2, and the mass-intensity criteria in Table 3 for 50 ng DFTPP.

10.2 Mass-spectral libraries: Detection and identification of compounds of interest are dependent upon spectra stored in user-created libraries.

10.2.1 Obtain a mass spectrum of the acetyl derivative of each chlorophenolic compound (pollutant, labeled compound, and the sample matrix internal standard) by derivatizing and analyzing an authentic standard either singly or as part of a mixture in which there is no interference between closely eluting components. That only a single compound is present is determined by examination of the spectrum. Fragments not attributable to the compound under study indicate the presence of an interfering compound.

10.2.2 Adjust the analytical conditions and scan rate (for this test only) to produce an undistorted spectrum at the GC peak maximum. An undistorted spectrum will usually be obtained if five complete spectra are collected across the upper half of the GC peak. Software algorithms designed to ''enhance'' the spectrum may eliminate distortion, but may also eliminate authentic m/z's or introduce other distortion.

10.2.3 The authentic reference spectrum is obtained under DFTPP tuning conditions (Section 10.1 and Table 3) to normalize it to spectra from other instruments.

10.2.4 The spectrum is edited by removing all peaks in the m/z 42 to 45 range, and saving the five most intense mass spectral peaks and all other mass spectral peaks greater than 10% of the base peak (excluding the peaks in the m/z 42 to 45 range). The spectrum may be further edited to remove common interfering m/z's. The spectrum obtained is stored for reverse search and for compound confirmation. 10.3 Minimum level: Demonstrate that the chlorophenolics are detectable at the minimum level (per all criteria in Section 14). The nominal 5 µg/mL calibration standard (Section 7.13) can be used to demonstrate this performance.

10.4 Calibration with isotope dilution: Isotope dilution is used when (1) labeled compounds are available, (2) interferences do not preclude its use, and (3) the quantitation m/z (Table 4) extracted ion-current profile (EICP) area for the compound is in the calibration range. Alternative labeled compounds and quantitation m/z's may be used based on availability. If any of the above conditions preclude isotope dilution, the internal standard calibration method (Section 10.5) is used.

10.4.1 A calibration curve encompassing the concentration range is prepared for each compound to be determined. The relative response (pollutant to labeled) vs. concentration in standard solutions is plotted or computed using a linear regression. The example in Figure 1 shows a calibration curve for phenol using phenol-d5 as the isotopic diluent. Also shown are the ±10% error limits (dotted lines). Relative response (RR) is determined according to the procedures described below. A minimum of five data points are employed for calibration.

10.4.2 The relative response of a pollutant to its labeled analog is determined from isotope ratio values computed from acquired data. Three isotope ratios are used in this process:

R_x = the isotope ratio measured for the pure pollutant.

R_y = the isotope ratio measured for the labeled compound.

R_m = the isotope ratio of an analytical mixture of pollutant and labeled compounds.

The m/z's are selected such that $R_x > R_y$. If R_m is not between $2R_y$ and $0.5R_x$, the method does not apply and the sample is analyzed by the internal standard method.

10.4.3 Capillary columns sometimes separate the pollutant-labeled pair when deuterium labeled compounds are used, with the labeled compound eluted first (Figure 2). For this case,

$$R_x = \left[\frac{\text{area } m_1/z}{1}\right], \text{ at the retention time of the pollutant } (RT_2).$$

$$R_y = \left[\frac{1}{\text{area } m_2/z}\right], \text{ at the retention time of the labeled compound } (RT_1).$$

$$R_m = \left[\frac{\text{area at } m_1/z\ (\text{at } RT_2)}{\text{area at } m_2/z\ (\text{at } RT_1)}\right], \text{ as measured in the mixture of the pollutant and labeled compounds (Figure 2), and } RR = R_m.$$

10.4.4 When the pollutant-labeled pair is not separated (as occurs with carbon-13-labeled compounds), or when another labeled compound with interfering spectral masses overlaps the pollutant (a case which can occur with isomeric compounds), it is necessary to determine the contributions of the pollutant and labeled compound to the respective EICP areas. If the peaks are separated well enough to permit the data system or operator to remove the contributions of the compounds to each other, the equations in Section 10.4.3 apply. This usually occurs when the height of the valley between the two GC peaks at the same m/z is less than 70 to 90% of the height of the shorter of the two peaks. If significant GC and spectral overlap occur, RR is computed using the following equation:

$$RR = \frac{(R_y - R_m)(R_x + 1)}{(R_m - R_x)(R_y + 1)}$$

Where:

R_x is measured as shown in figure 3A,
R_y is measured as shown in figure 3B,
R_m is measured as shown in figure 3C.

For example, R_x = 46100/4780 = 9.644; R_y = 2650/43600 = 0.0608; R_m = 49200/48300 = 1.1019; thus, RR = 1.114. 10.4.5 To calibrate the analytical system by isotope dilution, analyze a 1-µL aliquot of each of the calibration standards (Section 7.13) using the procedure in Section 12. Compute the RR at each concentration.

10.4.6 Linearity: If the ratio of relative response to concentration for any compound is constant (less than 20% coefficient of variation) over the five-point calibration range, an averaged relative response/concentration ratio may be used for that compound; otherwise, the complete calibration curve for that compound shall be used over the five-point calibration range.

10.5 Calibration by internal standard: The method contains two types of internal standards, the sample matrix internal standard (SMIS) and the instrument internal standard (IIS), and they are used for different quantitative purposes. The 3,4,5-trichlorophenol sample matrix internal standard (SMIS) is used for measurement of all pollutants with no labeled analog and when the criteria for isotope dilution (Section 10.4) cannot be met. The 2,2′-difluorobiphenyl instrument internal standard (IIS) is used for determination of the labeled compounds and the SMIS. The results are used for intralaboratory statistics (Sections 9.4.4 and 9.6.3).

10.5.1 Response factors: Calibration requires the determination of response factors (RF) for both the pollutants with no labeled analog and for the labeled compounds and the SMIS. The response factor is defined by the following equation:

$$RF = \frac{(A_s \times C_{is})}{(A_{is} \times C_s)}$$

Where:

A_s = the area of the characteristic mass for the compound in the daily standard.
A_{is} = the area of the characteristic mass for the internal standard.
C_{is} = the concentration of the internal standard (µg/mL).
C_s = is the concentration of the compound in the calibration standard (µg/mL).

When this equation is used to determine the response factors for pollutant compounds without labeled analogs, use the area (A_{is}) and concentration (C_{is}) of 3,4,5-trichlorophenol (SMIS) as the internal standard. When this equation is used to determine the response factors for the labeled

analogs and the SMIS, use the area (A_{is}) and concentration (C_{is}) of 2,2′-difluorobiphenyl as the internal standard.

10.5.2 The response factor is determined for at least five concentrations appropriate to the response of each compound (Section 7.13); nominally, 5, 10, 20, 50, and 100 µg/mL. The amount of SMIS added to each solution is the same (25 µg/mL) so that C_{is} remains constant. Likewise, the concentration of IIS is constant in each solution. The area ratio (A_s/A_{is}) is plotted versus the concentration ratio (C_s/C_{is}) for each compound in the standard to produce a calibration curve.

10.5.3 Linearity: If the response factor (RF) for any compound is constant (less than 35% coefficient of variation) over the five-point calibration range, an averaged response factor may be used for that compound; otherwise, the complete calibration curve for that compound shall be used over the five-point range.

10.6 Combined calibration: By using calibration solutions (Section 7.13) containing the pollutants, labeled compounds, and the internal standards, a single set of analyses can be used to produce calibration curves for the isotope dilution and internal standard methods. These curves are verified each shift (Section 9) by analyzing the OPR standard, or an optional calibration verification (VER) standard. Recalibration is required only if OPR criteria (Section 9.6 and Table 5) cannot be met.

11.0 Sample Derivatization, Extraction, and Concentration

The procedure described in this section uses a stir-bar in a beaker for the derivatization. The extraction procedures applied to samples depend on the type of sample being analyzed. Extraction of samples from in-process wastewaters is performed using a separatory funnel procedure. All calibrations, IPR, OPR, and blank analyses associated with in-process wastewater samples must be performed by the separatory funnel procedure.

Extraction of samples of final effluents and raw water may be performed using either the stir-bar procedure or the separatory funnel procedure. However, all calibrations, IPR, OPR, blank, and sample analyses must be performed using the same procedure. Both procedures are described below.

11.1 Preparation of all sample types for stir-bar derivatization.

11.1.1 Allow sample to warm to room temperature.

11.1.2 Immediately prior to measuring, shake sample vigorously to insure homogeneity.

11.1.3 Measure 1000 mL (±10 mL) of sample into a clean 2000-mL beaker. Label the beaker with the sample number.

11.1.4 Dilute aliquot(s).

11.1.4.1 Complex samples: For samples that are expected to be difficult to derivatize, concentrate, or are expected to overload the GC column or mass spectrometer, measure an additional 100 mL (±1 mL) into a clean 2000-mL beaker and dilute to a final volume of 1000-mL (±50 mL) with reagent water. Label with the sample number and as the dilute aliquot. However, to ensure adequate sensitivity, a 1000-mL aliquot must always be prepared and analyzed.

11.1.4.2 Pulp and paper industry samples: For in-process streams such as E-stage and C-stage filtrates and other in-process wastewaters, it may be necessary to prepare an aliquot at an additional level of dilution. In this case, dilute 10 mL (±0.1 mL) of sample to 1000-mL (±50 mL).

11.1.5 QC aliquots: For a batch of samples of the same type to be extracted at the same time (to a maximum of 20), place two 1000-mL (±10 mL) aliquots of reagent water in clean 2000-mL beakers. Label one beaker as the blank and the other as the ongoing precision and recovery (OPR) aliquot. Because final effluent samples are treated with ascorbic acid and in-process wastewater samples are not (see Section 11.1.6), prepare an OPR aliquot and a blank for the final effluent and a separate pair for the in-process samples. Treat these QC aliquots in the same fashion as the associated samples, adding ascorbic acid to the pair associated with the final effluents, and not adding ascorbic acid to the pair associated with the in-process samples.

11.1.6 Ascorbic acid: Added to stabilize chlorocatechols. However, for pulp and paper industry in-process streams and other in-process wastewaters, the addition of ascorbic acid may convert chloro-o-quinones to catechols if these quinones are present. Separate calibration curves must be prepared with and without the addition of ascorbic acid (Section 7.13.2).

11.1.6.1 Spike 5 to 6 mL of the ascorbic acid solution (Section 7.2.2) into each final effluent sample, and the associated calibration standards, IPR and OPR aliquots, and blank.

11.1.6.2 For pulp and paper industry C-stage filtrates, E-stage filtrates, and untreated effluents, omit the ascorbic acid to prevent the conversion of chloro-o-quinones to catechols. Prepare calibration standards, IPR and OPR aliquots, and blanks associated with these samples without ascorbic acid as well.

11.1.7 Spike 1000 µL of the labeled compound spiking solution (Section 7.8) into the sample and QC aliquots.

11.1.8 Spike 500 µL of the nominal 50 µg/mL calibration solution (Section 7.13.4) into the OPR aliquot.

11.1.9 Adjust the pH of the sample aliquots to between 7.0 and 7.1. For calibration standards, IPR and OPR aliquots, and blanks, pH adjustment is not required.

11.1.10 Equilibrate all sample and QC solutions for approximately 15 minutes, with occasional stirring.

11.2 Derivatization: Because derivatization must proceed rapidly, particularly upon the addition of the K_2CO_3 buffer, it is necessary to work with one sample at a time until the derivatization step (Section 11.2.3) is complete.

11.2.1 Place a beaker containing a sample or QC aliquot on the magnetic stirrer in a fume hood, drop a clean stirring bar into the beaker, and increase the speed of the stirring bar until the vortex is drawn to the bottom of the beaker.

11.2.2 Measure 25 to 26 mL of K_2CO_3 buffer into a graduated cylinder or other container and 25 to 26 mL of acetic acid into another.

11.2.3 Add the K_2CO_3 buffer to the sample or QC aliquot, immediately (within one to three seconds) add the acetic anhydride, and stir for three to five minutes to complete the derivatization.

11.3 Extraction: Two procedures are described below for the extraction of derivatized samples. The choice of extraction procedure will depend on the sample type. For final effluent samples, either of two procedures may be utilized for extraction of derivatized samples. For samples of in-process wastewaters, the separatory funnel extraction procedure must be used.

NOTE: Whichever procedure is employed, the same extraction procedure must be used for calibration standards, IPR aliquots, OPR aliquots, blanks, and the associated field samples.

11.3.1 Stir-bar extraction of final effluents.

11.3.1.1 Add 200 mL (±20 mL) of hexane to the beaker and stir for three to five minutes, drawing the vortex to the bottom of the beaker.

11.3.1.2 Stop the stirring and drain the hexane and a portion of the water into a 500- to 1000-mL separatory funnel. Allow the layers to separate.

11.3.1.3 Drain the aqueous layer back into the beaker.

11.3.1.4 The formation of emulsions can be expected in any solvent extraction procedure. If an emulsion forms, the laboratory must take steps to break the emulsion before proceeding. Mechanical means of breaking the emulsion include the use of a glass stirring rod, filtration through glass wool, and other techniques. For emulsions that resist these techniques, centrifugation is nearly 100% effective.

If centrifugation is employed to break the emulsion, drain the organic layer into a centrifuge tube, cap the tube, and centrifuge for two to three minutes or until the phases separate. If the emulsion cannot be completely broken, collect as much of the organic phase as possible, and measure and record the volume of the organic phase collected.

If all efforts to break the emulsion fail, including centrifugation, and none of the organic phase can be collected, proceed with the dilute aliquot (Section 11.1.4.2). However, use of the dilute aliquot will sacrifice the sensitivity of the method, and may not be appropriate in all cases.

11.3.1.5 Drain the organic layer into a Kuderna-Danish (K-D) apparatus equipped with a 10-mL concentrator tube. Label the K-D apparatus. It may be necessary to pour the organic layer through a funnel containing anhydrous sodium sulfate to remove any traces of water from the extract.

11.3.1.6 Repeat the extraction (Section 11.3.1.1 through 11.3.1.5) two more times using another 200-mL of hexane for each extraction, combining the extracts in the K-D apparatus.

11.3.1.7 Proceed with concentration of the extract, as described in Section 11.4.

11.3.2 Separatory funnel extraction of either final effluents or in-process wastewaters.

11.3.2.1 Transfer the derivatized sample or QC aliquot to a 2-L separatory funnel.

11.3.2.2 Add 200 mL (±20 mL) of hexane to the separatory funnel. Cap the funnel and extract the sample by shaking the funnel for two to three minutes with periodic venting.

11.3.2.3 Allow the organic layer to separate from the water phase for a minimum of 10 minutes.

11.3.2.4 Drain the lower aqueous layer into the beaker used for derivatization (Section 11.2), or into a second clean 2-L separatory funnel. Transfer the solvent to a 1000-mL K-D flask. It may be necessary to pour the organic layer through a funnel containing anhydrous sodium sulfate to remove any traces of water from the extract.

11.3.2.5 The formation of emulsions can be expected in any solvent extraction procedure. If an emulsion forms, the laboratory must take steps to break the emulsion before proceeding. Mechanical means of breaking the emulsion include the use of a glass stirring rod, filtration through glass wool, and other techniques. For emulsions that resist these techniques, centrifugation may be required.

If centrifugation is employed to break the emulsion, drain the organic layer into a centrifuge tube, cap the tube, and centrifuge for two to three minutes or until the phases separate. If the emulsion cannot be completely broken, collect as much of the organic phase as possible, and measure and record the volume of the organic phase collected. If all efforts to break the emulsion, including centrifugation, fail and none of the organic phase can be collected, proceed with the dilute aliquot (Section 11.1.4.2). However, use

of the dilute aliquot will sacrifice the sensitivity of the method, and may not be appropriate in all cases.

11.3.2.6 If drained into a beaker, transfer the aqueous layer to the 2-L separatory funnel (Section 11.3.2.1). Perform a second extraction using another 200 mL of fresh solvent.

11.3.2.7 Transfer the extract to the 1000-mL K-D flask in Section 11.3.2.4.

11.3.2.8 Perform a third extraction in the same fashion as above.

11.3.2.9 Proceed with concentration of the extract, as described in Section 11.4.

11.4 Macro concentration: Concentrate the extracts in separate 1000-mL K-D flasks equipped with 10-mL concentrator tubes. Add one to two clean boiling chips to the flask and attach a three-ball macro-Snyder column. Prewet the column by adding approximately 1 mL of hexane through the top. Place the K-D apparatus in a hot water bath so that the entire lower rounded surface of the flask is bathed with steam. Adjust the vertical position of the apparatus and the water temperature as required to complete the concentration in 15 to 20 minutes. At the proper rate of distillation, the balls of the column will actively chatter but the chambers will not flood. When the liquid has reached an apparent volume of 1 mL, remove the K-D apparatus from the bath and allow the solvent to drain and cool for at least 10 minutes. Remove the Snyder column and rinse the flask and its lower joint into the concentrator tube with 1 to 2 mL of hexane. A 5-mL syringe is recommended for this operation.

11.5 Micro-concentration: Final concentration of the extracts may be accomplished using either a micro-Snyder column or nitrogen evaporation.

11.5.1 Micro-Snyder column: Add a clean boiling chip and attach a two-ball micro-Snyder column to the concentrator tube. Prewet the column by adding approximately 0.5 mL hexane through the top. Place the apparatus in the hot water bath. Adjust the vertical position and the water temperature as required to complete the concentration in 5 to 10 minutes. At the proper rate of distillation, the balls of the column will actively chatter but the chambers will not flood. When the liquid reaches an apparent volume of approximately 0.2 mL, remove the apparatus from the water bath and allow to drain and cool for at least 10 minutes. Remove the micro-Snyder column and rinse its lower joint into the concentrator tube with approximately 0.2 mL of hexane. Adjust to a final volume of 0.5 mL.

11.5.2 Nitrogen evaporation: Transfer the concentrator tube to a nitrogen evaporation device and direct a gentle stream of clean dry nitrogen into the concentrator. Rinse the sides of the concentrator tube with small volumes of hexane, and concentrate the extract to a final volume of 0.5 mL.

11.6 Spike each extract with 10 μL of the 2,2′-difluorobiphenyl IIS (Section 7.10) and transfer the concentrated extract to a clean screw-cap vial using hexane to rinse the concentrator tube. Seal the vial with a PTFE-lined lid, and mark the level on the vial. Label with the sample number and store in the dark at −20 to −10 °C until ready for analysis.

12.0 GCMS Analysis

12.1 Establish the following operating conditions:

Carrier gas flow: Helium at 30 cm/sec at 50 °C
Injector temperature: 300 °C
Initial temperature: 50 °C
Temperature program: 8 °C/min to 270 °C
Final hold: Until after 2,6-dichlorosyringaldehyde elutes

Adjust the GC conditions to meet the requirements in Section 9.6.1.1 and Table 2 for analyte separation and sensitivity. Once optimized, the same GC conditions must be used for the analysis of all standards, blanks, IPR and OPR aliquots, and samples.

12.2 Bring the concentrated extract (Section 11.6) or standard (Sections 7.13 and 7.14) to room temperature and verify that any precipitate has redissolved. Verify the level on the extract (Sections 7.13, 7.14, and 11.6) and bring to the mark with solvent if required.

12.3 Inject a 1-μL volume of the standard solution or extract using on-column or splitless injection. For 0.5 mL extracts, this 1-μL injection volume will contain 50 ng of the DFB internal standard. If an injection volume other than 1 μL is used, that volume must contain 50 ng of DFB.

12.4 Start the GC column temperature ramp upon injection. Start MS data collection after the solvent peak elutes. Stop data collection after the 2,6-dichlorosyringaldehyde peak elutes. Return the column to the initial temperature for analysis of the next sample.

13.0 Analysis of Complex Samples

Some samples may contain high levels (>1000 μg/L) of the compounds of interest, interfering compounds, and/or other phenolic materials. Some samples will not concentrate to 0.5 mL (Section 11.5); others will overload the GC column and/or mass spectrometer; others may contain amounts of phenols that may exceed the capacity of the derivatizing agent.

13.1 Analyze the dilute aliquot (Section 11.1.4) when the sample will not concentrate to 0.5 mL. If a dilute aliquot was not extracted, and the sample holding time (Section 8.4) has not been exceeded, dilute an aliquot of sample with reagent water, and derivatize and extract it (Section 11.1.4).

Otherwise, dilute the extract (Section 14.7.3) and quantitate it by the internal standard method (Section 14.3).

13.2 Recovery of the 2,2′-difluorobiphenyl instrument internal standard: The EICP area of the internal standard should be within a factor of two of the area in the OPR or VER standard (Section 9.6). If the absolute areas of the labeled compounds and the SMIS are within a factor of two of the respective areas in the OPR or VER standard, and the DFB internal standard area is less than one-half of its respective area, then internal standard loss in the extract has occurred. In this case, analyze the extract from the dilute aliquot (Section 11.1.4).

13.3 Recovery of labeled compounds and the sample matrix internal standard (SMIS): SMIS and labeled compound recovery specifications have been developed for samples with and without the addition of ascorbic acid. Compare the recoveries to the appropriate limits in Table 5.

13.3.1 If SMIS or labeled compound recoveries are outside the limits given in Table 5 and the associated OPR analysis meets the recovery criteria, the extract from the dilute aliquot (Section 11.1.4) is analyzed as in Section 14.7.

13.3.2 If labeled compound or SMIS recovery is outside the limits given in Table 5 and the associated OPR analysis did not meet recovery criteria, a problem in the derivatization/extraction/concentration of the sample is indicated, and the sample must be rederivatized and reanalyzed.

14.0 Data Analysis and Calculations

14.1 Qualitative determination: Identification is accomplished by comparison of data from analysis of a sample or blank with data stored in the mass spectral libraries. Identification of a compound is confirmed when the following criteria are met:

14.1.1 The signals for m/z 43 (to indicate the presence of the acetyl derivative) and all characteristic m/z's stored in the spectral library (Section 10.2.4) shall be present and shall maximize within the same two consecutive scans.

14.1.2 Either (1) the background corrected EICP areas, or (2) the corrected relative intensities of the mass spectral peaks at the GC peak maximum shall agree within a factor of two (0.5 to 2 times) for all m/z's stored in the library.

14.1.3 The relative retention time shall be within the window specified in Table 2.

14.1.4 The m/z's present in the mass spectrum from the component in the sample that are not present in the reference mass spectrum shall be accounted for by contaminant or background ions. If the mass spectrum is contaminated, an experienced spectrometrist (Section 1.4) shall determine the presence or absence of the compound.

14.2 Quantitative determination by isotope dilution: By adding a known amount of a labeled compound to every sample prior to derivatization and extraction, correction for recovery of the pollutant can be made because the pollutant and its labeled analog exhibit the same effects upon derivatization, extraction, concentration, and gas chromatography. Relative response (RR) values for sample mixtures are used in conjunction with calibration curves described in Section 10.4 to determine concentrations directly, so long as labeled compound spiking levels are constant. For the phenol example given in Figure 1 (Section 10.4.1), RR would be equal to 1.114. For this RR value, the phenol calibration curve given in Figure 1 indicates a concentration of 27 μg/mL in the sample extract (C_{ex}).

14.2.1 Compute the concentration in the extract using the response ratio determined from calibration data (Section 10.4) and the following equation:

$$C_{ex}(\mu g/mL) = \left(A_n \times C_l\right) / \left(A_l \times RR\right)$$

Where:

C_{ex} = concentration of the pollutant in the extract.
A_n = area of the characteristic m/z for the pollutant.
C_l = concentration of the labeled compound in the extract.
A_l = area of the characteristic m/z for the labeled compound.
RR = response ratio from the initial calibration.

14.2.2 For the IPR (Section 9.3.2) and OPR (Section 9.6), compute the percent recovery of each pollutant using the equation in Section 14.6. The percent recovery is used for the evaluation of method and laboratory performance, in the form of IPR (Section 9.3.2) and OPR (Section 9.6).

14.3 Quantitative determination by internal standard: Compute the concentration using the response factor determined from calibration data (Section 10.5) and the following equation:

$$C_{ex}(\mu g/mL) = \left(A_s \times C_{is}\right) / \left(A_{is} \times RF\right)$$

Where:

C_{ex} = concentration of the pollutant in the extract.
A_s = area of the characteristic m/z for the pollutant.
C_{is} = concentration of the internal standard in the extract (see note below).
A_{is} = area of the characteristic m/z for the internal standard.
RF = response factor from the initial calibration.

NOTE: When this equation is used to compute the extract concentrations of native compounds without labeled analogs, use the

area (A_{is}) and concentration (C_{is}) of 3,4,5-trichlorophenol (SMIS) as the internal standard.

For the IPR (Section 9.3.2) and OPR (Section 9.6), compute the percent recovery using the equation in Section 14.6.

NOTE: Separate calibration curves will be required for samples with and without the addition of ascorbic acid, and also for both extraction procedures (stir-bar and separatory funnel) where applicable.

14.4 Compute the concentration of the labeled compounds and the SMIS using the equation in Section 14.3, but using the area and concentration of the 2,2′-difluorobiphenyl as the internal standard, and the area of the labeled compound or SMIS as A_s.

14.5 Compute the concentration of each pollutant compound in the sample using the following equation:

$$C_s = (\mu g/L) = \frac{(C_{ex} \times V_{ex})}{V_o}$$

Where:

C_s = Concentration of the pollutant in the sample.
C_{ex} = Concentration of the pollutant in the extract.
V_{ex} = Volume of the concentrated extract (typically 0.5 mL).
V_o = Volume of the original sample in liters.

14.6 Compute the recovery of each labeled compound and the SMIS as the ratio of concentration (or amount) found to the concentration (or amount) spiked, using the following equation:

$$\text{Percent recovery} = \frac{\text{Concentration found}}{\text{Concentration spiked}} \times 100$$

These percent recoveries are used to assess method performance according to Sections 9 and 13.

14.7 If the EICP area at the quantitation m/z for any compound exceeds the calibration range of the system, three approaches are used to obtain results within the calibration range.

14.7.1 If the recoveries of all the labeled compounds in the original sample aliquot meet the limits in Table 5, then the extract of the sample may be diluted by a maximum of a factor of 10, and the diluted extract reanalyzed.

14.7.2 If the recovery of any labeled compound is outside its limits in Table 5, or if a tenfold dilution of the extract will not bring the pollutant within the calibration range, then extract and analyze a dilute aliquot of the sample (Section 11). Dilute 100 mL, 10 mL, or an appropriate volume of sample to 1000 mL with reagent water and extract per Section 11.

14.7.3 If the recoveries of all labeled compounds in the original sample aliquot (Section 14.7.1) meet the limits in Table 5, and if the sample holding time has been exceeded, then the original sample extract is diluted by successive factors of 10, the DFB internal standard is added to give a concentration of 50 µg/mL in the diluted extract, and the diluted extract is analyzed. Quantitation of all analytes is performed using the DFB internal standard.

14.7.4 If the recoveries of all labeled compounds in the original sample aliquot (Section 14.7.1) or in the dilute aliquot (Section 14.7.2) (if a dilute aliquot was analyzed) do not meet the limits in Table 5, and if the holding time has been exceeded, re-sampling is required.

14.8 Results are reported for all pollutants, labeled compounds, and the sample matrix internal standard in standards, blanks, and samples, in units of µg/L.

14.8.1 Results for samples which have been diluted are reported at the least dilute level at which the area at the quantitation m/z is within the calibration range (Section 14.7).

14.8.2 For compounds having a labeled analog, results are reported at the least dilute level at which the area at the quantitation m/z is within the calibration range (Section 14.7) and the labeled compound recovery is within the normal range for the method (Section 13.3).

15.0 Method Performance

15.1 Single laboratory performance for this method is detailed in References 1, 2, and 11. Acceptance criteria were established from multiple laboratory use of the draft method.

15.2 A chromatogram of the ongoing precision and recovery standard (Section 7.14) is shown in Figure 4.

16.0 Pollution Prevention

16.1 The solvents used in this method pose little threat to the environment when recycled and managed properly.

16.2 Standards should be prepared in volumes consistent with laboratory use to minimize the volume of expired standards to be disposed.

17.0 Waste Management

17.1 It is the laboratory's responsibility to comply with all federal, state, and local regulations governing waste management, particularly the hazardous waste identification rules and land disposal restrictions, and to protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Compliance with all sewage discharge permits and regulations is also required.

17.2 Samples preserved with HCl or H_2SO_4 to pH <2 are hazardous and must be neutralized before being disposed, or must be handled as hazardous waste.

17.3 For further information on waste management, consult ''The Waste Management Manual for Laboratory Personnel'', and ''Less is Better: Laboratory Chemical Management for Waste Reduction'', both available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street N.W., Washington, DC 20036.

18.0 References

18.1 ''Chlorinated Phenolics in Water by In Situ Acetylation/GC/MS Determination,'' Method CP–86.01, National Council of the Paper Industry for Air and Stream Improvement, Inc., 260 Madison Avenue, New York, NY 10016 (July 1986).

18.2 ''6240-Chlorinated Phenolics (Interim Standard),'' Draft Version, U.S. Environmental Protection Agency, Manchester Laboratory, Manchester, Washington.

18.3 ''Performance Tests for the Evaluation of Computerized Gas Chromatography/Mass Spectrometry Equipment and Laboratories,'' USEPA, EMSL Cincinnati, OH 45268, EPA–600/4–80–025 (April 1980).

18.4 ''Working with Carcinogens,'' DHEW, PHS, CDC, NIOSH, Publication 77–206 (August 1977).

18.5 ''OSHA Safety and Health Standards, General Industry,'' OSHA 2206, 29 CFR 1910 (January 1976).

18.6 ''Safety in Academic Chemistry Laboratories,'' ACS Committee on Chemical Safety (1979).

18.7 ''Interlaboratory Validation of U. S. Environmental Protection Agency Method 1625A, Addendum Report,'' SRI International, Prepared for Analysis and Evaluation Division (WH–557), USEPA, 401 M St., SW., Washington, DC 20460 (January 1985).

18.8 ''Handbook of Analytical Quality Control in Water and Wastewater Laboratories,'' USEPA, EMSL, Cincinnati, OH 45268, EPA–600/4–79–019 (March 1979).

18.9 ''Standard Practice for Sampling Water,'' ASTM Annual Book of Standards, ASTM, Philadelphia, PA, 76 (1980).

18.10 ''Methods 330.4 and 330.5 for Total Residual Chlorine,'' USEPA, EMSL, Cincinnati, OH 45268, EPA 600/4–70–020 (March 1979).

18.11 ''Determination of Chlorophenolics, Special Analytical Services Contract 1047, Episode 1886,'' Analytical Technologies, Inc., Prepared for W. A. Telliard, Industrial Technology Division (WH–552), USEPA, 401 M St., SW., Washington, DC 20460 (June 1990).

18.12 ''Determination of Chlorophenolics by GCMS, Development of Method 1653,'' Analytical Technologies, Inc., Prepared for W. A. Telliard, Industrial Technology Division (WH–552), USEPA, 401 M St., SW., Washington, DC 20460 (May 1991).

19.0 Tables and Figures

TABLE 1—CHLOROPHENOLIC COMPOUNDS DETERMINED BY GCMS USING ISOTOPE DILUTION AND INTERNAL STANDARD TECHNIQUES

Compound	Pollutant		Labeled compound		
	CAS registry	EPA-EGD	Analog	CAS registry	EPA-EGD
4-chlorophenol	106–48–9	1001			
2,4-dichlorophenol	120–83–2	1002	d_3	93951–74–7	1102
2,6-dichlorophenol	87–65–0	1003			
2,4,5-trichlorophenol	95–95–4	1004			
2,4,6-trichlorophenol	88–06–2	1005			
2,3,4,6-tetrachlorophenol	58–90–2	1006			
pentachlorophenol	87–86–5	1007	$^{13}C_6$	85380–74–1	1107
4-chloroguaiacol	16766–30–6	1008	$^{13}C_6$	136955–39–0	1108
3,4-dichloroguaiacol	77102–94–4	1009			
4,5-dichloroguaiacol	2460–49–3	1010			
4,6-dichloroguaiacol	16766–31–7	1011			
3,4,5-trichloroguaiacol	57057–83–7	1012			
3,4,6-trichloroguaiacol	60712–44–9	1013			
4,5,6-trichloroguaiacol	2668–24–8	1014	$^{13}C_6$	136955–40–3	1114
tetrachloroguaiacol	2539–17–5	1015	$^{13}C_6$	136955–41–4	1115
4-chlorocatechol	2138–22–9	1016			
3,4-dichlorocatechol	3978–67–4	1017			
3,6-dichlorocatechol	3938–16–7	1018			
4,5-dichlorocatechol	3428–24–8	1019	$^{13}C_6$	136955–42–5	1119

TABLE 1—CHLOROPHENOLIC COMPOUNDS DETERMINED BY GCMS USING ISOTOPE DILUTION AND INTERNAL STANDARD TECHNIQUES—Continued

Compound	Pollutant		Labeled compound		
	CAS registry	EPA-EGD	Analog	CAS registry	EPA-EGD
3,4,5-trichlorocatechol	56961–20–7	1020			
3,4,6-trichlorocatechol	32139–72–3	1021			
tetrachlorocatechol	1198–55–6	1022	$^{13}C_6$	136955–43–6	1122
5-chlorovanillin	19463–48–0	1023	$^{13}C_6$	136955–44–7	1123
6-chlorovanillin	18268–76–3	1024			
5,6-dichlorovanillin	18268–69–4	1025			
2-chlorosyringaldehyde	76341–69–0	1026			
2,6-dichlorosyringaldehyde	76330–06–8	1027			
trichlorosyringol	2539–26–6	1028			
Sample matrix internal standard (SMIS)					
3,4,5-trichlorophenol	609–19–8	184			
Instrument internal standard (IIS)					
2,2′-difluorobiphenyl	388–82–9	164			

TABLE 2—GAS CHROMATOGRAPHY AND METHOD DETECTION LIMITS FOR CHLOROPHENOLICS

EGD No.[1]	Compound	Retention time mean (sec)[2]	EGD ref No.	RRT window[3]	Minimum level[4] (µg/L)	MDL[5] (µg/L)
1001	4-chlorophenol	691	184	0.651–0.681	1.25	1.11
1003	2,6-dichlorophenol	796	184	0.757–0.779	2.5	1.39
1102	2,4-dichlorophenol-d_3	818	164	0.986–0.998		
1202	2,4-dichlorophenol	819	1102	0.997–1.006	2.5	0.15
164	2,2′-difluorobiphenyl (I.S.)	825	164	1.000		
1108	4-chloroguaiacol-$^{13}C_6$	900	164	1.077–1.103		
1208	4-chloroguaiacol	900	1108	0.998–1.002	1.25	0.09
1005	2,4,6-trichlorophenol	920	184	0.879–0.895	2.5	0.71
1004	2,4,5-trichlorophenol	979	184	0.936–0.952	2.5	0.57
1016	4-chlorocatechol	1004	184	0.961–0.975	1.25	0.59
1011	4,6-dichloroguaiacol	1021	184	0.979–0.991	2.5	0.45
1009	3,4-dichloroguaiacol	1029	184	0.986–0.998	2.5	0.52
184	3,4,5-trichlorophenol (I.S.)	1037	164	1.242–1.272		
1010	4,5-dichloroguaiacol	1071	184	1.026–1.040	2.5	0.52
1018	3,6-dichlorocatechol	1084	184	1.037–1.053	2.5	0.57
1006	2,3,4,6-tetrachlorophenol	1103	184	1.050–1.078	2.5	0.38
1123	5-chlorovanillin-$^{13}C_6$	1111	164	1.327–1.367		
1223	5-chlorovanillin	1111	1123	0.998–1.001	2.5	1.01
1013	3,4,6-trichloroguaiacol	1118	184	1.066–1.090	2.5	0.46
1024	6-chlorovanillin	1122	184	1.070–1.094	2.5	0.94
1017	3,4-dichlorocatechol	1136	184	1.083–1.105	2.5	0.60
1119	4,5-dichlorocatechol-$^{13}C_6$	1158	164	1.384–1.424		
1219	4,5-dichlorocatechol	1158	1119	0.998–1.001	2.5	0.24
1012	3,4,5-trichloroguaiacol	1177	184	1.120–1.160	2.5	0.49
1114	4,5,6-trichloroguaiacol-$^{13}C_6$	1208	164	1.444–1.484		
1214	4,5,6-trichloroguaiacol	1208	1114	0.998–1.002	2.5	0.25
1021	3,4,6-trichlorocatechol	1213	184	1.155–1.185	5.0	0.44
1025	5,6-dichlorovanillin	1246	184	1.182–1.222	5.0	0.80
1026	2-chlorosyringaldehyde	1255	184	1.190–1.230	2.5	0.87
1107	pentachlorophenol-$^{13}C_6$	1267	164	1.511–1.561		
1207	pentachlorophenol	1268	1107	0.998–1.002	5.0	0.28
1020	3,4,5-trichlorocatechol	1268	184	1.208–1.238	5.0	0.53
1115	tetrachloroguaiacol-$^{13}C_6$	1289	164	1.537–1.587		
1215	tetrachloroguaiacol	1290	1115	0.998–1.002	5.0	0.23
1028	trichlorosyringol	1301	184	1.240–1.270	2.5	0.64
1122	tetrachlorocatechol-$^{13}C_6$	1365	164	1.630–1.690		
1222	tetrachlorocatechol	1365	1122	0.998–1.002	5.0	0.76
1027	2,6-dichlorosyringaldehyde	1378	184	1.309–1.349	5.0	1.13

[1] Four digit numbers beginning with 10 indicate a pollutant quantified by the internal standard method; four digit numbers beginning with 11 indicate a labeled compound quantified by the internal standard method; four digit numbers beginning with 12 indicate a pollutant quantified by isotope dilution.

[2] The retention times in this column are based on data from a single laboratory (reference 12), utilizing the GC conditions in Section 11.

[3] Relative retention time windows are estimated from EPA Method 1625.

[4] The minimum level (ML) is defined as the level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

[5] 40 CFR part 136, appendix B; from reference 2.

TABLE 3—DFTPP MASS INTENSITY SPECIFICATIONS [1]

Mass	Intensity required
51	8 to 82% of m/z 198.
68	Less than 2% of m/z 69.
69	11 to 91% of m/z 198.
70	Less than 2% of m/z 69.
127	32 to 59% of m/z 198.
197	Less than 1% of m/z 198.
198	Base peak, 100% abundance.
199	4 to 9% of m/z 198.
275	11 to 30% of m/z 198.
441	44 to 110% of m/z 443.
442	30 to 86% of m/z 198.
443	14 to 24% of m/z 442.

[1] Reference 7.

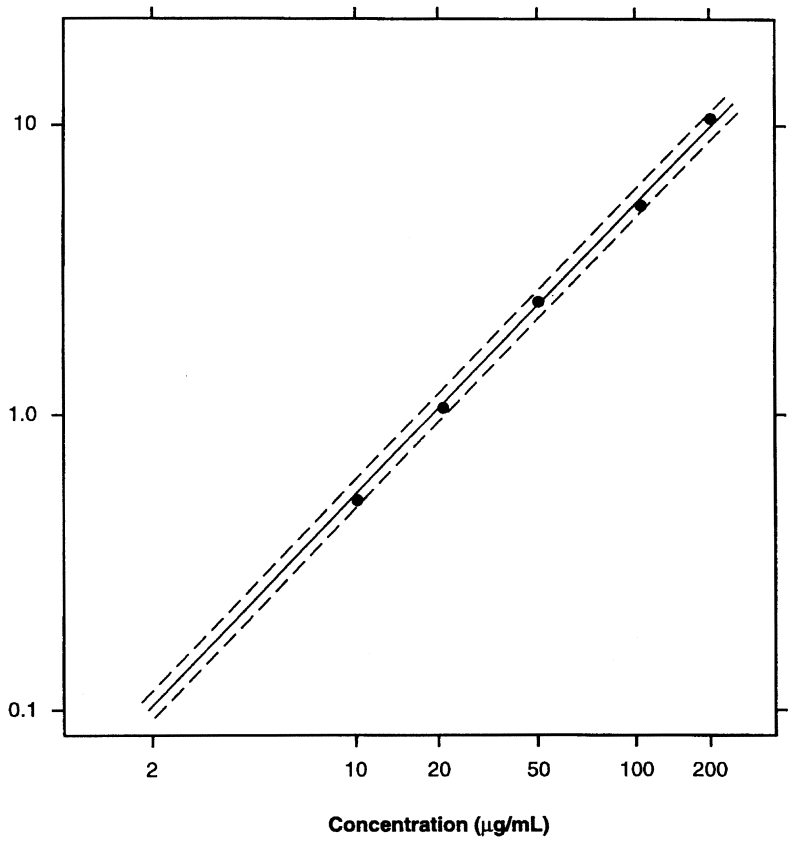
TABLE 4—CHARACTERISTIC M/Z'S OF CHLOROPHENOLIC COMPOUNDS

Compound	Primary m/z
4-chlorophenol	128
2,4-dichlorophenol	162
2,4-dichlorophenol-d_3	167
2,6-dichlorophenol	162
2,4,5-trichlorophenol	196
2,4,6-trichlorophenol	196
2,3,4,6-tetrachlorophenol	232
pentachlorophenol	266
pentachlorophenol-$^{13}C_6$	272
4-chloroguaiacol	158
4-chloroguaiacol-$^{13}C_6$	164
3,4-dichloroguaiacol	192
4,5-dichloroguaiacol	192
4,6-dichloroguaiacol	192
3,4,5-trichloroguaiacol	226
3,4,6-trichloroguaiacol	226
4,5,6-trichloroguaiacol	226
4,5,6-trichloroguaiacol-$^{13}C_6$	234
tetrachloroguaiacol	262
tetrachloroguaiacol-$^{13}C_6$	268
4-chlorocatechol	144
3,4-dichlorocatechol	178
3,6-dichlorocatechol	178
4,5-dichlorocatechol	178
4,5-dichlorocatechol-$^{13}C_6$	184
3,4,5-trichlorocatechol	212
3,4,6-trichlorocatechol	212
tetrachlorocatechol	248
tetrachlorocatechol-$^{13}C_6$	254
5-chlorovanillin	186
5-chlorovanillin-$^{13}C_6$	192
6-chlorovanillin	186
5,6-dichlorovanillin	220
2-chlorosyringaldehyde	216
2,6-dichlorosyringaldehyde	250
trichlorosyringol	256
Sample Matrix Internal Standard (SMIS)	
3,4,5-trichlorophenol	196
Instrument Internal Standard (IIS)	
2,2′-difluorobiphenyl	190

TABLE 5—ACCEPTANCE CRITERIA FOR PERFORMANCE TESTS [1]

EGD No. [2]	Compound	Test conc. [3] (μg/mL)	Initial precision and recovery sec. 9.3.2 (percent)		Ongoing recovery sec. 9.6 (percent)	Labeled compound and SMIS recovery sec. 9.4 and 14.6	
			s	X		With ascorbic acid P (%)	Without ascorbic acid P (%)
1001	4-chlorophenol	25	64	72–144	40–236		
1202	2,4-dichlorophenol	50	14	84–120	84–118		
1102	2,4-dichlorophenol-d_3	25	54	64–160	56–170	58–135	27–143
1003	2,6-dichlorophenol	50	20	66–148	58–170		
1004	2,4,5-trichlorophenol	50	14	78–140	82–128		
1005	2,4,6-trichlorophenol	50	20	72–142	72–146		
1006	2,3,4,6-tetrachlorophenol	50	14	80–132	82–132		
1207	pentachlorophenol	100	6	90–111	84–120		
1107	pentachlorophenol-$^{13}C_6$	25	21	58–169	61–157	8–143	27–167
1208	4-chloroguaiacol	25	20	88–120	88–120		
1108	4-chloroguaiacol-$^{13}C_6$	25	104	68–148	64–152	59–121	43–168
1009	3,4-dichloroguaiaco [4]	50	18	80–126	82–126		
1010	4,5-dichloroguaiacol	50	14	82–121	80–128		
1011	4,6-dichloroguaiacol	50	16	82–126	86–120		
1012	3,4,5-trichloroguaiacol	50	16	78–130	80–134		
1013	3,4,6-trichloroguaiacol	50	16	64–152	74–140		
1214	4,5,6-trichloroguaiacol	50	14	92–106	88–116		
1114	4,5,6-trichloroguaiacol-$^{13}C_6$	25	48	66–146	74–140	48–131	51–139
1215	tetrachloroguaiacol	100	7	84–115	81–126		
1115	tetrachloroguaiacol-$^{13}C_6$	25	22	57–173	65–161	35–120	27–161
1016	4-chlorocatechol	25	48	76–140	80–124		
1017	3,4-dichlorocatechol	50	24	66–154	78–134		
1018	3,6-dichlorocatechol	50	16	78–136	84–126		
1219	4,5-dichlorocatechol	50	8	84–118	86–122		
1119	4,5-dichlorocatechol-$^{13}C_6$	25	78	68–144	66–142	33–129	0–190
1020	3,4,5-trichlorocatechol	100	17	60–166	72–128		
1021	3,4,6-trichlorocatechol [4]	100	17	74–138	64–149		
1222	tetrachlorocatechol	100	29	46–234	81–132		
1122	tetrachlorocatechol-$^{13}C_6$	25	39	48–227	63–152	14–118	0–184
1223	5-chlorovanillin	50	20	94–208	84–118		
1123	5-chlorovanillin-$^{13}C_6$	25	84	68–160	70–144	51–126	32–254
1024	6-chlorovanillin	50	22	82–128	80–126		
1025	5,6-dichlorovanillin	100	9	67–146	77–140		
1026	2-chlorosyringaldehyde	50	28	76–130	72–156		
1027	2,6-dichlorosyringaldehyde	100	14	82–129	60–183		
1028	trichlorosyringol	50	18	76–136	66–174		
	Sample Matrix Internal Standard						
184	3,4,5-trichlorophenol	100	47	62–185	68–144	56–116	24–167

[1] Specifications derived from multi-laboratory testing of draft method.
[2] Four-digit numbers beginning with 10 indicate a pollutant quantified by the internal standard method; four-digit numbers beginning with 11 indicate a labeled compound quantified by the internal standard method; four-digit numbers beginning with 12 indicate a pollutant quantified by isotope dilution.
[3] Test concentrations are in units of μg/mL.
[4] Specification derived from isomer.



The dotted lines enclose a ±10% error window.

52-020-21A

Figure 1. Relative Response Calibration Curve for Phenol

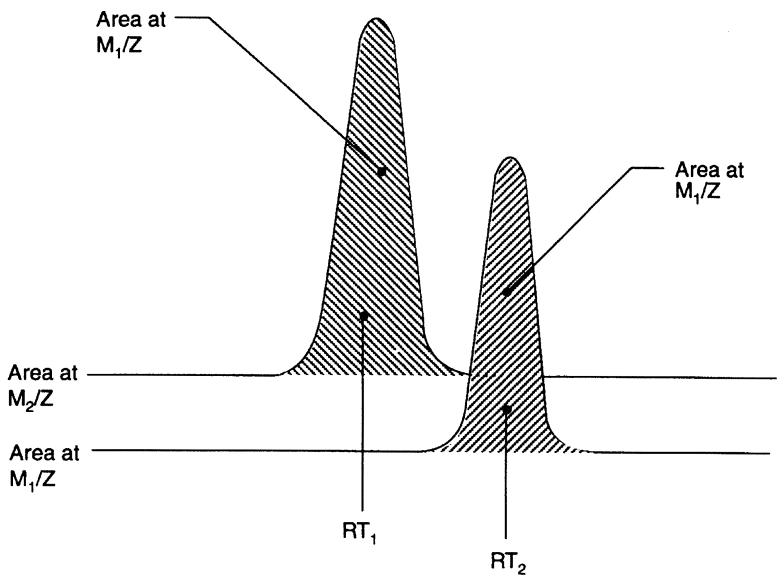


Figure 2. Extracted Ion-Current Profiles for Chromatographically Resolved Labeled (M_2/Z) and Unlabeld (M_1/Z) Pairs

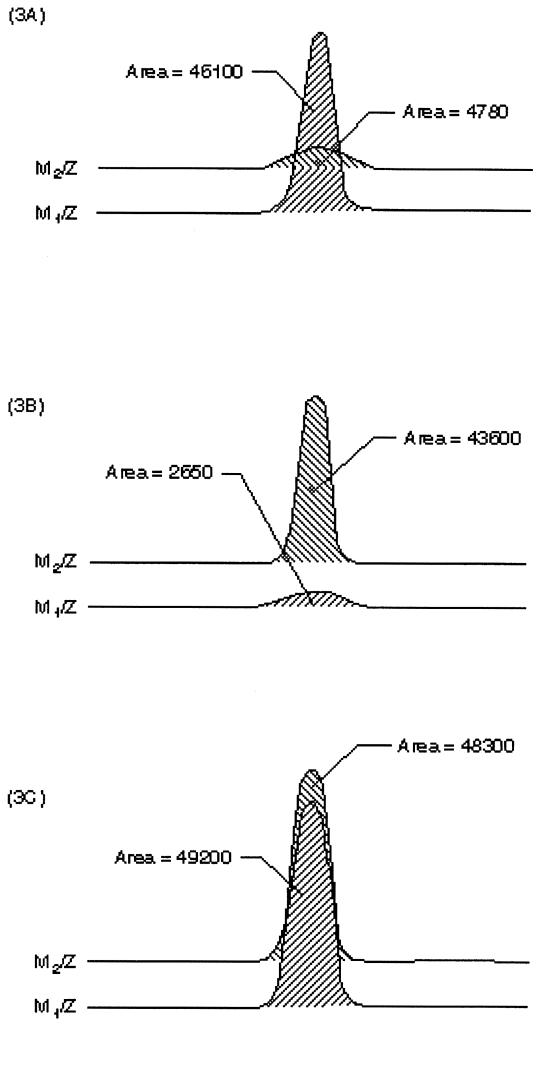


Figure 3. Extracted Ion-Current Profiles for (3A) Unlabeled Compound, (3B) Labeled Compound, and (3C) Equal Mixture of Unlabeled and Labeled Compounds.

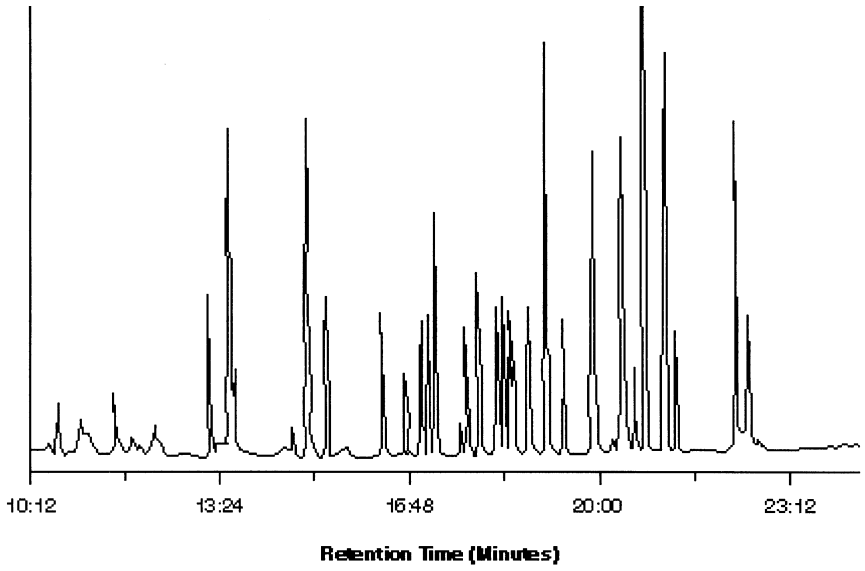


Figure 4. Chromatogram of Chlorophenolics

20.0 Glossary of Definitions and Purposes

These definitions and purposes are specific to this method but have been conformed to common usage as much as possible.

20.1 Units of weight and measure and their abbreviations

20.1.1 Symbols.

°C degrees Celsius
µL microliter
< less than
> greater than
% percent

20.1.2 Alphabetical characters.

cm centimeter
g gram
h hour
ID inside diameter
in. inch
L liter
M Molecular ion
m meter
mg milligram
min minute
mL milliliter
mm millimeter
m/z mass-to-charge ratio
N normal; gram molecular weight of solute divided by hydrogen equivalent of solute, per liter of solution
OD outside diameter
pg picogram
ppb part-per-billion
ppm part-per-million
ppt part-per-trillion
psig pounds-per-square inch gauge
v/v volume per unit volume
w/v weight per unit volume

20.2 Definitions and acronyms (in alphabetical order).

Analyte: A chlorophenolic tested for by this method.

The analytes are listed in Table 1.

Calibration standard (CAL): A solution prepared from a secondary standard and/or stock solutions and used to calibrate the response of the instrument with respect to analyte concentration.

Calibration verification standard (VER): The mid-point calibration standard (CS3) that is used to verify calibration. See Table 4.

Chlorophenolics: collectively, the analytes listed in Table 1.

CS1, CS2, CS3, CS4, CS5: See Calibration standards and Table 4.

Field blank: An aliquot of reagent water or other reference matrix that is placed in a sample container in the laboratory or the field, and treated as a sample in all respects, including exposure to sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the field blank is to determine if the field or sample transporting procedures and environments have contaminated the sample.

GC: Gas chromatograph or gas chromatography.

HRGC: High resolution GC.

IPR: Initial precision and recovery; four aliquots of the diluted PAR standard analyzed to establish the ability to generate acceptable precision and accuracy. An IPR is performed prior to the first time this method is used and any time the method or instrumentation is modified.

K-D: Kuderna-Danish concentrator; a device used to concentrate the analytes in a solvent.

Laboratory blank: See Method blank.

Laboratory control sample (LCS): See Ongoing precision and recovery standard (OPR).

Laboratory reagent blank: See Method blank.

May: This action, activity, or procedural step is neither required nor prohibited.

May not: This action, activity, or procedural step is prohibited.

Method blank: An aliquot of reagent water that is treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, internal standards, and surrogates that are used with samples. The method blank is used to determine if analytes or interferences are present in the laboratory environment, the reagents, or the apparatus.

Minimum level (ML): The level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

MS: Mass spectrometer or mass spectrometry.

Must: This action, activity, or procedural step is required.

OPR: Ongoing precision and recovery standard (OPR); a laboratory blank spiked with known quantities of analytes. The OPR is analyzed exactly like a sample. Its purpose is to assure that the results produced by the laboratory remain within the limits specified in this method for precision and recovery.

PAR: Precision and recovery standard; secondary standard that is diluted and spiked to form the IPR and OPR.

Preparation blank: See Method blank.

Primary dilution standard: A solution containing the specified analytes that is purchased or prepared from stock solutions and diluted as needed to prepare calibration solutions and other solutions.

Quality control check sample (QCS): A sample containing all or a subset of the analytes at known concentrations. The QCS is obtained from a source external to the laboratory or is prepared from a source of standards different from the source of calibration standards. It is used to check laboratory performance with test materials prepared external to the normal preparation process.

Reagent water: Water demonstrated to be free from the analytes of interest and potentially interfering substances at the method detection limit for the analyte.

Relative standard deviation (RSD): The standard deviation times 100 divided by the mean.

RF: Response factor. See Section 10.5.1.

RR: Relative response. See Section 10.4.4.

RSD: See Relative standard deviation.

Should: This action, activity, or procedural step is suggested but not required.

Stock solution: A solution containing an analyte that is prepared using a reference material traceable to EPA, the National Institute of Science and Technology (NIST), or a source that will attest to the purity and authenticity of the reference material.

VER: See Calibration verification standard.

PART 431 [RESERVED]

PART 432—MEAT AND POULTRY PRODUCTS POINT SOURCE CATEGORY

Sec.

432.1 General applicability.
432.2 General definitions.
432.3 General limitation or standard for pH.
432.5 Incorporation by reference.

Subpart A—Simple Slaughterhouses

432.10 Applicability.
432.11 Special definitions.
432.12 Effluent limitations attainable by the application of the best practicable control technology currently available (BPT).
432.13 Effluent limitations attainable by the application of the best available technology economically achievable (BAT).