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

OFFICE OF
WATER

AUG 22 1985

MEMORANDUM

SUBJECT: Guidance for NPDES Permits Issued to Steam Electric Power Plants

FROM: Rebecca W. Hanmer, Director
Office of Water Enforcement and Permits (EN-335)

TO: Regional Water Management Division Directors
State NPDES Directors

The Office of Water Enforcement and Permits (OWEP) has received several inquiries about the proper implementation of the effluent limitations guideline for the steam electric power generating industrial category that was promulgated on November 19, 1982 (47 FR 52290). Specifically, we have been asked for guidance regarding the establishment of limitations when regulated process wastewater is commingled in a treatment facility such as an ash pond with uncontaminated dry weather flows or rainfall runoff. The attached guidance addresses the establishment of concentration or mass-based limits for such discharges.

We have also been asked to prepare guidance regarding the establishment of limitations for once-through cooling water when sequential chlorination is practiced. We are now preparing guidance on this subject. Until guidance is transmitted, please direct your specific questions to Charles Kaplan, National Expert for Thermal Pollution and Steam Electric, Water Management Division, Region IV, at FTS 257-3012. If you have any questions about the attached guidance please call Charles Kaplan or Gail Goldberg of the Permits Division at FTS 426-7010.

Attachment

cc: Ed Johnson (OWRS)
Jeff Denit (ITD/OWRS)
Coke Cherney (OGC)

GUIDANCE FOR CO-TREATMENT FACILITIES AT STEAM ELECTRIC POWER PLANTS

I. Question

What limitations for total suspended solids (TSS) and oil and grease (O&G) are appropriate in NPDES permits which regulate discharges from co-treatment facilities at steam electric power plants? Co-treatment facilities in this context are treatment facilities such as ash ponds where process wastewater is commingled with uncontaminated dry weather flows or rainfall runoff. An uncontaminated flow is one with little or no TSS or O&G.

II. Answer

The specitic answer depends on whether or not rainfall run-off is commingled with the regulated waste stream in the treatment facility. In general, whenever different types of waste streams are subjected to co-treatment, mass limitations or flow-weighted concentration limitations should be applied to the combined discharge.

When rainfall runoff is not involved, concentration limits should be flow-weighted to account for dilution from combination with wastes not regulated for TSS and O&G. Some credit for pollutants present in the unregulated flows based on best professional judgment may be appropriate, if adequate data are available to characterize these flows. See the discussion in section IV below for more detail.

When one or more of the waste streams results from a rainfall event, as in the case of coal pile runoff (guidelines limited) or other site runoff (not regulated by guidelines), more stringent limitations or other permit conditions may be needed to assure

compliance with the regulations. In such cases, the capacity of the co-treatment facility is essential in determining whether BPT and BAT requirements are likely to be met. Sufficient capacity is needed to assure that previously settled pollutants are not washed out under high flow conditions.

Under rainfall runoff conditions we suggest two alternative approaches to permitting which are presented in Section V below. The first alternative discusses limitations for a co-treatment facility with sufficient capacity to meet BPT, BAT, and NSPS during periods of heavy flow. A second approach describes the limitations when the co-treatment facility does not have sufficient capacity necessary to assure compliance with BPT, BAT, and NSPS.

Where rainfall runoff is involved, we suggest additional monitoring requirements in permits as described in Section VI below.

III. Background

The effluent limitation guidelines for the steam electric power generating industrial category, under 40 CFR Part 423, (November 19, 1982, 47 FR 52290) establish limitations for total suspended solids (TSS) (30*/100**mg/l) and oil and grease (O&G) (15*/20**mg/l) for certain waste streams including low volume wastes and ash transport water. However, these limitations are not appropriate for TSS and O&G if dilution occurs in a co-treatment facility. For example, dilution occurs where guidelines-limited flows are mixed with uncontaminated dry weather waste flows, coal pile runoff or other wet weather runoff flows.

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* Daily Average/**Daily Maximum

It is the intent of EPA that mass or flow-weighted concentration limitations be included in NPDES permits. 40 CFR 423.12(b), states (the same requirements are in 423.13 and 423.15):

> "(11) At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass based limitations specified in paragraphs (b)(3) through (7) of this section. Concentration limitations shall be those concentrations specified in this section."
>
> "(12) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source."

IV. Co-Treatment Facilities Without Rainfall Runoff

To be consistent with the guidelines limitations, concentration based permit limitations should account for dilution where unregulated dry weather flows are combined in a co-treatment facility with regulated waste sources. Examples of unregulated dry weather flows are cooling tower blowdown (with little or no O&G), once-through auxiliary equipment cooling water (little or no added TSS or O&G) and air conditioning wastes (no added TSS or O&G). Some best professional judgment (BPJ) credit for pollutants present in such low contamination flows may be granted by the permitting authority, if adequate supporting data are presented by the permittee. However, any calculations to provide

credit should also consider the removal provided by the co-treatment facility.

V. Co-treatment Facilities With Rainfall Runoff

In evaluating situations in which coal pile runoff, unregulated wet weather flows and dry weather flows are combined in the co-treatment facility, it is necessary to determine whether the limitations developed for dry weather conditions will assure compliance with BPT and BAT. Under circumstances in which the co-treatment facility has sufficient capacity to provide a specified minimum level of treatment, the dry weather limitations generally will be sufficient to provide that assurance. However, if the co-treatment facility does not have sufficient capacity to provide the minimum level of treatment, alternate limitations should be developed.

To determine if the dry weather limitations will assure compliance with BPT, BAT, and NSPS, it is necessary to determine if the limitation for coal pile runoff can be met. The guidelines limitations for coal pile runoff is 50 mg/l as an instantaneous maximum for TSS. There is no allowance for O&G. This guidelines limitation is significantly more stringent than those discussed above for other waste streams (30/100 for TSS and 15/20 for O&G).

In the 1974 Development Document (EPA-440/1-74/029(a), October 1974, page 312), EPA defined treatment technology for coal pile runoff as follows:

"Storage ponds for retention and treatment for coal pile runoff should be designed for local weather conditions. The design basis of the pond should be complete retention of runoff resulting from a storm which occurs once in ten years."

In promulgating these regulations (39 FR 36186, October 8, 1974), EPA relied on this technology not only for coal pile runoff, but also for all runoff sources included in the "area runoff subcategory" (Subpart D, 40 CFR 423.40-.46). Additionally, in the 1982 Development Document (EPA-440/1-82/029, November 1982, page 274) EPA determined that limitations for seven toxic pollutants which were found to be present in coal pile runoff (beryllium, cadmium, chromium, copper, lead, nickel, and zinc) could be excluded from further national regulation since the BPT and NSPS limitations for TSS would effectively control the discharge of those pollutants.

A. The Co-Treatment Facility Has Sufficient Capacity

To assure compliance with BPT, BAT and NSPS, the co-treatment facility should have sufficient capacity. The capacity of the co-treatment facility is sufficient if the minimum free water volume (between the top of the sediment level and the minimum discharge elevation) is greater than or equal to the sum of the following volumes:

(1) rainfall directly on the entire pond area (total area inside dike) resulting from a 10-year, 24-hour rainfall event (10y24h rainfall) for the locality in question,

(2) all rainfall related flows (e.g., coal pile runoff, roof and yard drains, etc.,) to the facility resulting from the 10y24h rainfall,

(3) maximum dry weather waste stream flows to the facility over a 24-hour period, and

(4) Solids added to the sediment level of the co-treatment facility during the term of the permit.

This minimum level of treatment is considered necessary to assure that the high flows and velocities through the co-treatment facility associated with the 10y24h rainfall (1) do not wash out previously settled pollutants, and (2) do not preclude proper sedimentation and removal of pollutants during and subsequent to the 10y24h rainfall event. Availability of this free water volume will generally assure compliance with BPT, BAT, and NSPS requirements of 40 CFR 423 for both plant wastes and runoff flows. Then the flow-weighted dry weather limitations are appropriate during wet weather conditions (at a maximum of 30/100 mg/l TSS and 15/20 mg/l oil and grease).

B. <u>The Co-Treatment Facility Does Not Have Sufficient Capacity</u>

Where the co-treatment facility does not have sufficient capacity, more stringent requirements are necessary to assure that BPT, BAT, and NSPS requirements are met. In this case, the permittee may need to increase the capacity of the co-treatment facility by adding additional pond(s), dredging, increasing dike or weir height, adding stop logs, etc. An expansion of the co-treatment facility should be completed under the terms of an

administrative order which includes a compliance schedule for the modifications.

If the permittee is unable to increase system volume, the following items should be considered:

1. Mass or flow-weighted dry weather limitations;
2. Mass or flow-weighted wet weather limitations to assure that coal pile guideline requirements are met;
3. Toxic pollutant limitations and/or monitoring;
4. Frequency and timing of sampling;
5. Internal monitoring on tributary waste streams;
6. Reopener clause keyed to internal monitoring data; and
7. Other site-specific factors.

The permit writer should contact Charles Kaplan (Region IV, 404/881-3012, FTS 257-3012) for assistance in developing permit limitations or other conditions to assure compliance with guidelines requirements under wet weather conditions.

VI. Additional Monitoring

When significant quantities of wet weather flow are co-treated in the treatment facility, additional monitoring requirements for TSS, O&G, and flow are appropriate for all significant rainfall events (e.g, 25% of the 10y24h rainfall). This monitoring requirement should specify sampling at the time of maximum expected flow (6 to 24 hours or more after the event depending on co-treatment facility characteristics).

Such monitoring conditions could be modified or terminated at a later date when enough data have been collected to demonstrate continuing compliance during wet weather conditions.

5/23/85
CHK

PLANT EXAMPLE

Available information

Low volume wastes	10.0	MGD
Ash transport water	20.0	
Cooling tower blowdown	5.0	
Auxiliary cooling water	5.0	
Metal cleaning waste	0.2	MG/cleaning(1)
Total plant dry weather flow	40.0	MGD
Coal pile area	30.0	acres
Parking lot area	16.0	
Roof and yard drain, etc. area	35.0	
Ash pond area(2)	100.0	
Total runoff area	181.0	acres
10-year, 24-hour storm (10Y24H)	5.5	inches/day
Annual rainfall	60.0	inches (0.164 inch/day)

Calculations

Runoff from 10Y24H storm at a runoff coefficient of 1.0(3) = 27.0 MG
Total ash pond volume necessary for use of alternate approach = 67.0 MG
= 206 A-ft

Notes:

1. Not used in calculations since metal cleaning wastes and ash transport water do not normally occur simultaneously.
2. Including ash delta and interior dike slopes.
3. A runoff coefficient of 1.0 is recommended since (1) the 10Y24H storm is generally part of a larger storm system and the ground is likely to be nearly saturated and (2) storms of larger magnitude than the 10Y24H will occur but are not being considered in the calculations.

CASE I

Ash pond water surface area (acres)	80.0
Average water depth (feet)	3.25
Available volume (A-ft)	260.0

Since the pond volume exceeds the necessary storage volume of 206 A-ft required to use the alternate approach, only dry weather flows need be used in calculating effluent limitations.

Sources	Flow (MGD)	Daily Average Limitations (mg/l) TSS	Daily Average Limitations (mg/l) O&G	Daily Maximum Limitations (mg/l) TSS	Daily Maximum Limitations (mg/l) O&G
Low volume wastes	10.0	30	15	100	20
Ash transport water	20.0	30	15	100	20
Auxiliary cooling water	5.0	5(1)	0(1)	10(1)	1(1)
Cooling tower blowdown	5.0	30(1)	0	60(1)	3(1)
Flow weighted concentrations	(40.0)	26.9	11.3	83.8	15.5
Effluent limitations		27	11	84	16

te:
1. Based on BPJ and/or available data

CASE II

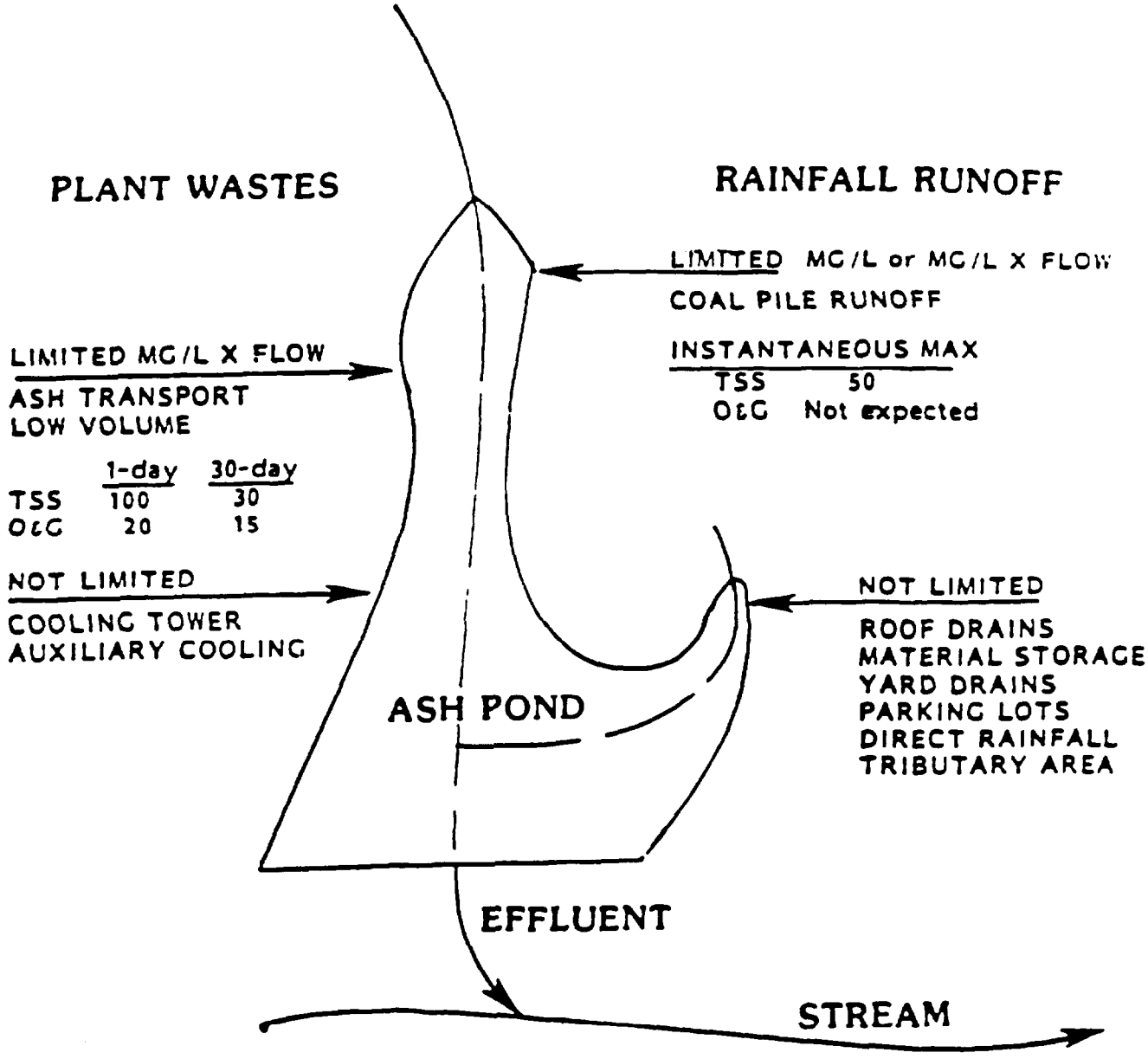
Ash pond water surface area (acres)	50.0
Average water depth (feet)	3.00
Available volume (A-ft)	150.0

Since the pond volume is less than the necessary storage volume of 206 A-ft required to use the alternative approach, wet weather flows must be used in calculating effluent limitations unless the permittee is willing to increase the available volume.

Sources	DA Flow (MGD)	Daily Average Limitations (mg/l) TSS	O&G	DM Flow (MGD)	Daily Maximum Limitations (mg/l) TSS	O&G
Low volume wastes	10.0	30	15	10.0	100	20
Ash transport water	20.0	30	15	20.0	100	20
Auxiliary cooling water	5.0	5(2)	0(2)	5.0	10(2)	1(2)
Cooling tower blowdown	5.0	30(2)	0(2)	5.0	60(2)	3(2)
Coal pile runoff	0.13(1)	30(3)	0(5)	4.48(6)	30(3)	0(5)
Parking lot runoff	0.07(1)	20(2)	5(2)	2.39(6)	30(2)	3(2)
Roof and yard drains, etc.	0.16(1)	20(2)	0(2)	5.23(6)	30(2)	0(2)
Ash pond surface rainfall	0.45(1)	20(4)	0(4)	14.93(6)	50(4)	0(4)
Flow weighted concentrations	(40.81)	26.8	11.03	(67.03)	66.53	9.4
Effluent limitations(7)		27(7)	9(7,8)		67(7)	9(7,8)

NOTES:

1. Runoff flows based on annual average rainfall of 0.164 inch per day with a runoff coefficient of 1.0. Another rainfall rate based on BPJ might be used such as the average rainfall rate for the maximum month, etc.
2. Based on BPJ and/or available data.
3. BPJ that 30 mg/l as both daily average and daily maximum is equivalent to the guideline limitation of 50 mg/l as an instantaneous maximum.
4. BPJ that partial credit for TSS is applicable for runoff on the pond surface which provides dilution, but also tends to "push" water already in the pond out. (Note that the pond surface is only 50% of the pond acreage.) No credit is given for O&G from direct rainfall.
5. Guideline provides no O&G contribution from this source.
6. Runoff flows based on 10Y24H rainfall of 5.5 inches per day with a runoff coefficient of 1.0.
7. Limitation must be less than or equal to the limitation derived for Case I.
8. Since the calculated daily maximum value (9 mg/l) is less than the daily average value (11 mg/l) for O&G and the lower value would have to be used for both DM and DA, a possible alternate could include limitations of: 11 mg/l as a DA, 9 mg/l as a DM when rainfall exceeds 1.0 inch/day (or other BPJ value) and 16 mg/l (from Case I) as a DM at any lower rainfall rate.


PLANT WASTES
RAINFALL RUNOFF
LIMITED MG/L or MG/L X FLOW
COAL PILE RUNOFF
INSTANTANEOUS MAX
TSS 50
O&G Not expected
LIMITED MG/L X FLOW
ASH TRANSPORT
LOW VOLUME
1-day 30-day
TSS 100 30
O&G 20 15
NOT LIMITED
COOLING TOWER
AUXILIARY COOLING
NOT LIMITED
ROOF DRAINS
MATERIAL STORAGE
YARD DRAINS
PARKING LOTS
DIRECT RAINFALL
TRIBUTARY AREA
ASH POND
EFFLUENT
STREAM