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

June 17 1975

OFFICE OF ENFORCEMENT

MEMORANDUM

TO: Bruce P. Smith, Biologist
Enforcement Division, Region III

FROM: J. William Jordan, Chemical Engineer (EG-336)
Permit Assistance & Evaluation Division

SUBJECT: Response to Request for Interpretation of the Chemical Effluent Limitation Guidelines for the Steam Electric Power Generation Industry

I apologize for the delay in responding to your request for an interpretation of the chemical guidelines, but I was unable to schedule a meeting with DeVereaux Barnes, Power Plant Guidelines Project Officer, until this week. Dev and I discussed the problem extensively. The following paragraphs outline our discussions regarding the application of iron and copper limitations on discharges from ash ponds and three alternative approaches are offered for determining compliance with these guidelines.

In regard to your question on the 10-year, 24-hour rainfall event, the only comment that we have at this time (and this is only an "off-the-top-of-the-head" comment) is that in using the 10-year, 24-hour stipulation in the guidelines, it should be assumed that the rainfall is continuous throughout the 10-hour period. Dev indicated to me that other questions similar to this have been raised both for the Steam Electric Power Generation industry and other industries like the Fertilizer industry, and that records of these questions and responses are being kept by the Regional Desk in the Effluent Guidelines Division. I would suggest that you call the Regional Desk and get copies of this correspondence (202-426-2571) which will give a more detailed explanation.

The case described in your correspondence where several discharges are being made to the ash pond (in your example the discharges were metal cleaning wastes, boiler blowdown, and ash sluice water) there are at least three ways of placing requirements on these discharges in the permitting process. Before entering into this explanation, it should be

restated that iron and copper limits apply to metal cleaning wastes and boiler blowdown but not to ash sluice water. Total suspended solids are, however, limited for the ash sluice discharge stream. The example provided in your correspondence appears to be using an iron concentration for the ash sluice water prior to adequate treatment for the total suspended solids. One of the conclusions from our discussions this week was that even though there is no specific limitation for iron in ash sluice water, the concentration used for calculating a quantity limitation for this discharge stream should be that concentration after adequate treatment for the total suspended solids.

The following indicates three possible alternative approaches which should be satisfactory for determining compliance with the chemical effluent limitation guidelines. The examples assume that metal cleaning wastes, boiler blowdown, and ash sluice water are all discharged to the ash pond prior to a final ash pond discharge to the receiving water body. The recommended approaches are:

1. If the metal cleaning waste and boiler blowdown are adequately treated down to 1 mg/l prior to discharge to the ash pond, then this would be satisfactory for assuring compliance with the iron and copper limitation guidelines. Internal monitoring on the discharge from the treatment system for these two waste streams prior to discharge to the ash pond, could be used to demonstrate compliance with the guidelines. In this case, it would not be necessary to monitor for iron and copper in the discharge from the ash pond unless it was felt that this was necessary to monitor for compliance with water quality standards.

2. If an applicant makes a satisfactory demonstration that, because of the alkalinity and retention time of the ash pond, adequate treatment of the iron and copper is being carried out in the ash pond, then it may be acceptable to allow use of the ash pond for treatment of the iron and copper. An example of a fossil fuel power plant whose ash pond does adequately treat all of the waste streams is attached. In this particular example (see the results of the sampling analysis) there is actually less iron and copper in the discharge from the ash pond than was contained in the intake water to the power plant (in other words, a "negative net"). The efficiency of this treatment is attributable to the high alkalinity in the pond as well as 100 days retention time.

3. A more general situation where the applicant may use the ash pond as his treatment device should be discussed. In order to establish a final iron and copper limit on the discharge from the ash pond, it is recommended that the following procedure be used: the flows of the metal cleaning wastes and the boiler blowdown should be multiplied by 1 mg/l to obtain the quantity limitation from these sources. Since there are no iron and copper limits for ash sluice water, the iron and copper concentrations to use in calculating the total quantity limit for ash sluice water must be determined. As previously mentioned in the third paragraph, Dev and I feel that the applicant must determine what the concentration of iron and copper is or would be in the ash sluice water after the ash sluice water is in compliance with the total suspended solids limitation (30 mg/l). An example* of how this third approach might work for the iron quantity limit is illustrated below:

Metal Cleaning Wastes and Boiler Blowdown

(4MGD)(1mg/l)(8.34lbs/gal) = 33.4lbs/day

Ash Sluice Water

Initially contains TSS = 300 mg/l and Fe = 40 mg/l. After treating TSS to 30 mg/l, the Fe is reduced to 4 mg/l (assumes all iron tied up in TSS).

(4MGD)(4mg/l)(8.34lbs/gal) = 133.6 lbs/day

Allowable Discharge of Iron from Ash Pond

33.4 lbs/day + 133.6 lbs/day = 167.0 lbs/day

In regard to the question on distinguishing between metal cleaning and low volume wastes, the following clarification is offered. All water washing operations are "low volume" while any discharge from an operation involving chemical cleaning should be included in the metal cleaning category.

*Note that intake concentrations do not add intake concentrations if a net limit is allowed for iron. The Guidelines Development Document recommends "zero" net for TSS from ash ponds.

We are forwarding copies of this response to the other Regional Offices of EPA. If you have any questions on the above explanations, or if we receive any comments or questions from the other Regional Offices, revisions and/or additions will be forwarded to all ten Regions. I have also attached a copy of some proposed examples prepared by the NUS Corporation and revised by us at Headquarters which may provides some insight into the problem. When these examples are finalized, they will also be forwarded to all Regional Offices.

Thank you again for bringing this problem to our attention.

J. William Jordan

Attachments

cc: R. Schaffer
C. Schafer
D. Barnes
B. Jordan
R. Irwin
D. Browne
R. Chase, Reg. I
H. Lunenfeld, Reg. II
C. Kaplan, Reg. IV
G. Milburn, Reg. V
F. Humpke, Reg. VI
R. Langemeier, Reg. VII
R. Burm, Reg. VIII
M. Maher, Reg. IX
R. Stamnis, Reg. X

Appendix IV(B)
Letter to Bill Jordan from Bruce Smith
re Jordan Memorandum (1975)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

In reply refer to -
3EN21

May 21, 1975

Mr. Bill Jordan EG 336
Environmental Protection Agency
Crystal Mall 2 Room 706
Washington, D.C. 20460

Dear Bill:

Certain aspects of the Development Document for Steam Electric Power Plants are open to various interpretations and as such, have had an adverse affect on the design and scheduling of suitable treatment facilities needed to comply with guideline limitations. I will attempt to outline two of these problem areas and offer solutions, but the main intent of this letter is to obtain written clarification from headquarters on these issues.

Table A-X-1 on page 416 of the Development Document calculates the allowable iron limitation in kg/day for the boiler blowdown and metal cleaning waste source categories and then adds the following footnote to the limitation: " + Note: Plus effluent from sources with no limitation". This footnote is somewhat vague, and no further explanation is offered in the main text of the Development Document. Some power companies have interpreted this footnote to mean that in a situation where metal cleaning wastes are dumped into an ash basin, the final effluent limitation in lbs/day from the ash basin is calculated from adding the normal lbs/day of iron contained in the ash sluice water with the allowable lbs/day of iron for the metal cleaning wastes, i.e.:

metal cleaning wastes
2 mgd flow X 1 ppm Fe allowable X 8.34 lbs/gal = 16.7 lbs/day

ash sluice water
4 mgd flow X 100 ppm Fe normal X 8.34 lbs/gal = 3336 lbs/day

allowable discharge of iron from basin
16.7 lbs/day + 3336 lbs/day = 3352.7 lbs/day

I cannot believe this interpretation is consistent with the intent of the guidelines or the Development Document. Iron in ash sluice water is associated with the ash particles, and an ash basin may attain 50% or better

removal of the ash particles from the ash sluice water prior to discharge. The total 3352.7 lbs/day permitted by the interpretation does not account for this removal and would allow an unrealistic and unacceptable level of pollution. I can find no indication in the Development Document that an ash pond constitutes acceptable treatment for metal cleaning wastes. Acceptable control or treatment technology for the iron or copper contained in metal cleaning wastes (as described in the Document) is generally not carried out in an ash pond.

I recommend that the footnote on page 416 be applied only after the effluent stream has been adequately treated to guideline levels, i.e., the discharger must treat a metal cleaning waste stream down to 1 mg/l for iron and copper before he can add it to the ash basin. If this interpretation is not acceptable, then the discharger should be required to demonstrate that the basin is capable of treating metal cleaning wastes down to 1 mg/l for iron and copper irrespective of any influence from the ash sluice waters. Headquarters should either delete this footnote or clarify its application.

There is some confusion as to what actually constitutes metal cleaning wastes. Many companies maintain that effluent streams that result exclusively from water washing of ash found on boiler fireside, air preheater, etc. should be considered in the low volume or ash transport waste source categories, while effluent streams resulting from cleaning processes involving any chemical solution (acid cleaning of boilers) should be considered in the metal cleaning waste source category. I am inclined to agree with the companies on this issue, but the guidelines clearly do not make such a distinction in the definition of metal cleaning wastes 423.11(j). The Development Document is very ambiguous on this issue. Chemical cleaning is distinguished from water cleaning on pages 136 to 148 of the Development Document. On page 410 of the Document, boiler and air heater cleaning and other equipment cleaning is included under the Low Volume Waste Waters Category (line 3), while on page 411 of the errata sheet, boiler fireside cleaning, air preheater cleaning, and miscellaneous equipment and stack cleaning is included under the Metal Cleaning Wastes Category. Headquarters should clarify why boiler cleaning was included in the Development Document under both the low volume waste source category and the metal cleaning waste source category. Headquarters should distinguish the type of cleaning that generates metal cleaning wastes and the type of cleaning that generates low volume wastes.

Your prompt attention to these issues is requested since future treatment designs will depend on your recommendations. With the publication of the Development Document, issues such as these may no longer be left to regional discretion.

For your general information, I have enclosed a diagram and general description of Pennsylvania Power and Light's proposed Iron Precipitation Detention Basin (IPDB) which is relatively cheap to construct and can treat iron down to levels near 0 ppm. Please note that in light of the footnote on table A-X-1 of the Document, they are now reconsidering the need for such a basin.

If there are any questions concerning this discussion, please don't hesitate to contact me at 215 597-8221.

Sincerely yours,

Bruce P. Smith
Delmarva-D.C. Section

Enclosure