

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

POLICY/PROCEDURE STATEMENT

TOPIC: Non-Contact Wet Cooling Towers as Insignificant Air Pollutant Sources

Policy Procedure Number: 3-b-0 4

Replaces Number: New

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Reviewer: Pete Hamlin

Approval: Bureau Chief: Pete Hamlin *PH*

Date: 6/15/98

Division Administrator: Allan Stokes *AS*

: 5/27/98

Applicable Code of Iowa or Iowa Administrative Code Rule(s):

Attachments: None.

REASON OR BACKGROUND Title V applicants are required to list all sources of air contaminants at their facility. Some facilities have cooling towers. In these facilities, water is generally used as a heat exchange media to cool industrial processes. Cooling towers are used to dissipate the heat that water has collected so that the water can be recirculated and reused or cooled sufficiently before discharged to a waterway.

Title V applicants are required to list all sources, significant and non-significant, of air pollution from a facility. Staff however has generally considered the emissions from cooling towers to be insignificant and has not pursued obtaining information from these sources in an air quality construction or operating permit.

This policy would establish that emissions from non-contact cooling towers are considered as insignificant and staff will not solicit this information for an air construction or operating permit application.

DETAILS

Cooling towers are heat exchangers that are used to dissipate large heat loads to the atmosphere. Heat from a process or from a cooling operation is transferred to the water. The heated water in a cooling tower transfers the heat in the water to the atmosphere. In a non-contact system, water does not come into direct contact with process materials.

Cooling towers provide direct contact between the cooling water and the air passing through the tower. During this process, some of the liquid water may be trapped in the air stream and be carried out of the tower as "drift" droplets. Therefore, the particulate matter constituents of the drift droplets may be classified as air emissions.

The drift droplets generally contain the same chemical impurities as the water circulating through the tower. These impurities can be converted to airborne emissions from the cooling tower. Dissolved solids found in cooling tower drift can consist of mineral matter, chemicals for corrosion inhibition, etc.

For an induced draft cooling tower, the total liquid drift emission factor, as found in AP-42, is 1.7 pounds/1000 gallons. The emission factor for PM-10 is 0.019 pounds/1,000 gallons. Below is an example of the emission calculation of PM-10 using the AP-42 emission factors.

Example Facility	
Cooling Tower Design Flow Rate	30,000 gpm (gallons per minute)
Potential Throughput*	(1.577 x 10 ¹⁰ gallons)
P-T-E** of PM-10 from the cooling tower	125 T-P-Y (tons per year) of PM-10

* (this represents the annual maximum amount of water that could circulate through the system, 24 hours a day, 365 days a year)

** P-T-E Potential to Emit

The above example shows that this cooling tower would be a major source for PM-10. However, staff considers this emission factor for cooling towers to be overly conservative and inappropriate. Although the calculated P-T-E would appear to warrant concern from cooling tower emissions, staff does not consider emissions from cooling towers to be of concern to require their accounting in an air quality construction or operating permit. This policy would allow staff to overlook any emission contribution from a cooling tower in an air quality construction or operating permit application.