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May 23, 2011 (Table revised 5/25/2011)

Clerk's Office  
Illinois Pollution Control Board  
100 W. Randolph, Suite 11-500  
Chicago, IL 60652

Re: R11-18, Triennial. Review of Water Quality Standards for Boron, Fluoride and Manganese

To whom it may concern:

Pre-Filed Testimony from James L. Machin, P.E. on Behalf of Marathon Petroleum Company, LP, to be Submitted to the Illinois Pollution Control Board on the Illinois Environmental Protection Agency (IEPA) Proposed Fluoride Water Quality Standard

Marathon supports the proposed amended rule to the General Use Water Quality Standards particularly as relates to fluoride, 35 IAC Sec. 302.208. This will establish variable acute and chronic instream water quality (WQ) standards for fluoride based on the hardness of the receiving water.

#### History of Fluoride Standards

The proposed revisions to the existing boron, fluoride, and manganese WQ standards are the result of new findings regarding the aquatic life toxicity of these substances and the influence of water chemistry on toxicity. The standard of 1.4 mg/L fluoride ("old standard") was adopted in 1972 based on opinions expressed in a 1963 literature survey conducted by the California State Water Quality Control Board and does not necessarily reflect actual toxicity in the environment. Still, fluoride was reported in this document to kill trout at concentrations ranging from 2.3 to 7.2 mg/L (McKee and Wolf, 1963), which is considerably higher than the old standard, and more in line with the proposed new standard. The authors reportedly emphasized in the foreword that the publication merely served as a survey and evaluation of the existing literature and that it should not be used to establish specific standards for the State of California or the Public Health Service.

Since then, additional studies and research based on U.S. Environmental Protection Agency guidelines have demonstrated that a sliding scale based on hardness with a maximum chronic limit of 4.0 mg/L ("new standard") is more appropriate for protection of aquatic organisms. These studies were conducted using classic dose-response bioassay tests. It is apparent that the toxicity of fluoride to aquatic life is diminished in response to increased water hardness.

In Illinois, public water utilities are required to fluoridate between 0.9 and 1.2 mg/L for human health benefits. This water is normally discharged to streams by wastewater treatment plants, leaving very little room for any additional fluoride contribution from natural or other sources to meet the current (old) standard.

We would like to add that IEPA has done an excellent job in researching and developing the proposed new standard and is to be commended for their efforts.

#### Standards in Other Jurisdictions

We researched the existing fluoride water quality standards in all states contiguous with Illinois, some other Midwestern states, and selected other states far removed from Illinois. Table 1 summarizes those standards. As shown, 4.0 mg/L is the most common fluoride standard, similar to the proposed new standard. Some are higher. In only one case other than irrigation is there a standard of 1.4 mg/L or lower.

#### Schedule

Marathon is particularly concerned about the schedule for implementation of the new WQ standard for fluoride as related to its NPDES permit. Marathon's current permit contains a fluoride effluent limitation of 1.4 mg/L, which is based on the old standard. In December 2010, Marathon received a permit modification that allows for a 15-month time period to achieve compliance with the permit-specified effluent limitation of 1.4 mg/L. The 15-month schedule includes milestones for design, construction, and operation of measures to reduce fluoride concentrations in the effluent. Marathon has already implemented several procedures to reduce fluoride concentration in their effluent, including establishing an NPDES Compliance Team that meets monthly to address fluoride and related issues. The team has already implemented several process and pollution prevention initiatives to reduce fluoride in the wastewater system.

The new standard would result in an effluent limitation that Marathon could meet. However, if the new standard is not promulgated in a timely manner, further reduction could require treatment that would be extremely expensive, and unnecessary in light of the proposed new standard. Consequently, Marathon could then be in a position of potential non-compliance with permit limits based on an old WQ standard that is scheduled to be replaced. Marathon wants to maintain an excellent compliance record and does not want to be facing potential permit violations because of delay in promulgation of the new standard.

Marathon requests that consideration of this standard change be completed as expeditiously as possible so that it can adequately plan and avoid potential permit non-compliance.

**Table 1. Water Quality Standards in Other Jurisdictions (rev. 5/25/11)**

JURISDICTION	AQUATIC LIFE (mg/L)		OTHER (mg/L)	OTHER USE
	Acute	Chronic		
Alaska <sup>13</sup>	none		4.0	Public Drinking Water
			1.0	Irrigation Water
EPA	none <sup>1</sup>		4.0 <sup>2</sup>	Drinking Water Supply
Florida <sup>3</sup>	10.0 (fresh); 5.0 (marine)		1.5	Potable Water Supply
			1.5	Shellfish Propagation and Harvesting
			10.0	Industrial
Indiana <sup>4</sup>	2.0		1.0	Ohio River and Interstate Wabash River Basins
Iowa <sup>5</sup>	none		4.0	Potable Water Supply
Kentucky <sup>6</sup>	none		4.0	Drinking Water Supply
Michigan <sup>7a</sup>	20.0	2.7	4.0	Drinking Water Supply <sup>7b</sup>
Missouri <sup>8</sup>	none		4.0	Livestock and Wildlife Watering
			4.0	Drinking Water Supply
			4.0	Groundwater
Ohio <sup>9</sup>	none		2.0	Protection of Agricultural uses
Texas <sup>10</sup>	none		4.0	Public Drinking Water
Wisconsin	none <sup>11</sup>		4.0	Drinking Water <sup>12</sup>
			4.0	Groundwater <sup>12</sup>

1. EPA Recommended Water Quality Standards
2. EPA Drinking Water Standards (p. 2)
3. Florida Surface Water Quality Standards, (p. 36)
4. Indiana Water Quality Standards (pg. 7)
5. Iowa Water Quality Criteria from <http://www.iowadnr.gov/water/standards/criteria.html> (p.4)
6. Kentucky Surface Water Standards (p. 5)
7. Michigan
  - a. Michigan Water Quality Criteria (row 283)
  - b. Drinking Water Criteria adopted from EPA [http://www.michigan.gov/deq/0,1607,7-135-3313\\_3675\\_3691---,00.html](http://www.michigan.gov/deq/0,1607,7-135-3313_3675_3691---,00.html)
8. Missouri Water Quality Criteria (p. 19)
9. Ohio Water Quality Criteria (pp. 10 and 23)
10. Texas Surface Water Quality Standards (p. 60)
11. Wisconsin Water Quality Criteria
12. Wisconsin Drinking and Groundwater Criteria <http://dnr.wi.gov/org/water/dwg/health/hal.htm>
13. Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (p. 17)

# Electronic Filing - Received, Clerk's Office, May 26, 2011

Illinois Pollution Control Board

May 23, 2011

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## References

McKee, J.E. and H.W. Wolf. 1963. Water Quality Criteria, 2<sup>nd</sup> ed. California State Water Quality Control Board. Publication No. 3-A.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Machin". The signature is fluid and cursive, with a large initial "J" and a long, sweeping underline.

James L. Machin, P.E.

cc: James Ellerbe, Senior Attorney, Marathon Petroleum Company, LP