BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF	)	
	)	
WATER QUALITY AMENDMENTS TO	)	
35 Ill. Adm. Code 302.208(e)-(g), 302.504(a)	)	R02-11
302.575(d), 303.444, 309.141(h); and	)	(Rulemaking-Water)
PROPOSED 35 Ill. Adm. Code 301.267,	)	
301.313, 301.413, 304.120, and 309.157	)	

P.C.# 25

NOTICE OF FILING

PLEASE TAKE NOTICE that on this date, September 6, 2002, I filed with Dorothy Gunn, Clerk of the Illinois Pollution Control Board, James R. Thompson Center, 100 West Randolph, Suite 11-500, Chicago, IL 60601, the enclosed Post-Second Hearing Comments of Environmental Law and Policy Center, Prairie Rivers Network and Sierra Club.

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(312) 795-3707

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PROPOSED 35 Ill. Adm. Code 301.367,	)	
301.313, 301.413, 304.120, and 309.157	)	

POST- SECOND HEARING COMMENTS OF ENVIRONMENTAL LAW AND POLICY CENTER, PRAIRIE RIVERS NETWORK AND SIERRA CLUB

The remaining issues in this proceeding are narrow, but important. On those issues, two conclusions emerge from the record.

First, the Board should allow the Illinois Environmental Protection Agency's proposal to weaken the cyanide standards to rest in peace. There is no scientific basis for weakening the standard and no good reason to change Illinois' cyanide standard at this time.

Second, IEPA's effort to have the Board ratify the Agency's 1980s decision to allow more deoxygenating wastes into Illinois waters than the regulations allow should not be adopted as proposed. This was clear before the July 25, 2002 hearing. It became even more clear after July 25 when IEPA released reports indicating that large numbers of Illinois waters are impaired by discharges of oxygen demanding waste by municipal wastewater plants and other point sources.

The Board should not adopt changes regarding deoxygenating wastes effluent limits without taking action to assure that any change does not exacerbate Illinois' serious problem with violations of the dissolved oxygen standard (35 Ill. Adm. Code 302.206) and the standard against offensive conditions (35 Ill. Adm. Code 302.203).

II. There is no valid reason to weaken Illinois' cyanide standard

During the July 25 hearing, IEPA reconfirmed that no testing has been done that indicates the effect of cyanide on Illinois endangered mussels. Further, no testing has been done that would support the conclusion that two Illinois endangered fish are not at least as sensitive to cyanide as salmonid species. [1] There has been no testing on any species of the same genus as the Blackchin Shiner and Iowa darter. (Mosher Testimony, July 25 Tr. 27, 30)

[1] The pollution sensitive species that IEPA eliminated from the U.S. EPA cyanide criteria calculation to propose its weaker standard may well serve as proxies for a number of sensitive species that live in Illinois. Indeed, studies cited by the United States Fish & Wildlife Service indicate that mussels are more sensitive to some pollutants than the species IEPA decided did not need to be protected because they do not live in Illinois.

In its testimony at the July 25 hearing, the Agency offers two new justifications for its cyanide proposal. Neither is persuasive.

The Agency Proposal has not been shown to be Conservative

First, in response to the fact that its proposed chronic standard is only a few parts per billion under the level know to harm a highly valued Illinois species (the Bluegill), IEPA has claimed that its standard is actually conservative. IEPA argues this is true because the laboratory toxicity tests, on which the criterion was based, were performed using free cyanide but the proposed standard is for weak acid dissociable cyanide ("WAD cyanide"), which measures some forms of cyanide that are not free.

However, IEPA admits that its standard does not measure total cyanide, which would include forms of cyanide compounds that are not measured by the tests for WAD cyanide. (Mosher Testimony, July 25 Tr. 11) Further, during the hearing it was determined that little is known of the toxicity of cyanide compounds, except that they are less toxic than free cyanide. (Mosher Testimony, July 25 Tr. 11-12) The circumstances in which the cyanide compounds break down in the environment to release free cyanide in Illinois waters are also unclear. The 1984 Criteria document, on which Illinois EPA selectively bases its argument, points out a wide variety of ways in which cyanide ions can be liberated from complexes by light, low pH or other factors. (pp.2-3)

In short, using WAD cyanide instead of free cyanide is conservative insofar as it includes forms of cyanide that are less toxic than the free cyanide that was used in the toxicity tests. Using WAD cyanide is not conservative, but risky, in that it does not include forms of cyanide that may be toxic or that may release free cyanide under other environmental conditions. Whether on balance using WAD cyanide is more conservative or less conservative is simply unknown.

The Testing Sensitivity Justification Offered for Weakening the Cyanide Standard fails factually and logically.

IEPA claims that, even if no discharger in Illinois is having any real problem with cyanide, adoption of its proposal is needed because the WAD method for testing cyanide is not accurate enough to test to the current 5.2 micrograms per liter standard.[2] In its pre-filed testimony, IEPA claimed there is no approved method that can reliably test at 5.2 micrograms.

However, as presented at the July 25 hearing, there is a US EPA approved method, OIA – 1677, capable of testing for cyanide well below the current standard.[3] This method is approved for NPDES permits. 64 Fed. Reg. 73414 (1999)

Predictably, Illinois EPA will now claim that although the U.S. EPA has approved a method that would allow testing well the level of the current standard, Illinois dischargers should not be

[2] Unfortunately, IEPA has also apparently failed to get its facts straight on whether there is a cyanide problem in Illinois. The Illinois Water Quality Report 2002, issued after the July 25 hearing by IEPA, shows 110 miles of Illinois streams as impaired by cyanide. (Ex. A)

[3] Actually it does not appear that the WAD method used by Illinois EPA has been approved by U.S. EPA.

required to use the method because there are no laboratories available. However, there is a long list of laboratories that can use the new method. (Ex. B)

The fact that there are not more such laboratories is undoubtedly due to the fact that Illinois and certain other states do not require that OIA - 1677 be used. Obviously, there will never be much demand for more sensitive testing as long as states are willing to accept testing less likely to reveal that a discharger has a problem.

Leaving aside the fact that IEPA is wrong in claiming that sufficiently sensitive testing methods do not exist, the fact is that lack of sufficiently sensitive testing is never a good reason for adopting a weaker standard. IEPA admits as much by admitting that the mercury should not be changed although IEPA (wrongly) believes that methods are not available to test down to the level of sensitivity required to measure mercury at the human health standard level. (Mosher Testimony July 25 Tr.32). See also 40 CFR Pt. 132 App. F Procedure 8 D. (pollutant minimization program designed for situation where water quality based effluent limit is below the quantification level for dischargers to the Great Lakes)

Moreover, IEPA's claim that the cyanide standard should be weakened because sufficiently sensitive testing methods are unavailable is somewhat disingenuous given that IEPA does not require testing sufficiently sensitive to catch violations of the current standard. *Under the current standard,* IEPA does not ask dischargers to test more accurately that 10 microgram per liter. (Mosher Testimony, July 25 Tr. 30) IEPA is asking the Board to change a standard so that IEPA will not have to require testing to a level of accuracy that it already does not require.

Although IEPA should require testing of sufficient accuracy to determine if water quality standards for mercury, cyanide and other pollutants are being violated when such accurate testing is available, it does not do so.

III. IEPA Must Do More to Prevent Violations of Dissolved Oxygen Standards

The Sierra Club, Prairie Rivers Network and the Environmental Law and Policy Center of the Midwest ("Environmental Groups") have not objected to using a CBOD5 test instead of a BOD5 test for determining whether sewerage treatment plants are meeting the secondary treatment requirements established by Congress decades ago. The federal rule that defines "secondary treatment" for technology-based limit purposes states that 25 mg/L CBOD5 may be substituted for 30 mg/L BOD5, 40 CFR § 133.102.

The problem is that IEPA's proposal ratifies its 1980s decision to measure CBOD5 instead of BOD5 with regard to discharges covered by 35 Ill. Adm. Code 304.120(b) and (c). These provisions are the only mechanisms Illinois has established to protect Illinois waters in the situation in which secondary treatment is not adequate to protect water quality because the effluent makes up a large percentage of the flow or there are multiple pollution sources. Because by definition

CBOD5 is less than all of the BOD5, IEPA's proposal has the effect of allowing more deoxygenating wastes to be discharged than is authorized under the current Board rules.[4]

Under the Clean Water Act, discharges of pollutants to the nation's waters were to be eliminated 15 years ago through a progressive tightening of effluent limits as technology improved. 33 USC § 1251(a)(1); Adler, R.W, Landman, J.C. and Cameron, D.M., The Clean Water Act 20 Year Later, Island Press (1993) p. 137. Now, however, we see the IEPA seeking to further loosen effluent limits from what was set by the Board almost 30 years ago (5 mg/L BOD5). From the level of support for the IEPA's proposal from the representatives of point source polluters, one must assume that the sewerage treatment industry has failed to make any technological advances in the treatment of deoxygenating waste in the last three decades.

That IEPA and sewerage treatment agencies are now asking for higher effluent limits than the Board established in 1973 is not merely a sad reflection on the industry. The failure to control deoxygenating waste has had serious impacts on Illinois waters.

A. Illinois waters now suffer from discharges of deoxygenating waste.

This is not the time to loosen controls on discharges of deoxygenating wastes but instead to find better ways to control these discharges. After the July 25 hearing, Illinois EPA released two reports indicating that discharges from point sources are causing violations of Illinois dissolved oxygen standards. The Illinois Water Quality Report 2002 states that 2962 miles of the 15,993 miles of streams assessed are impaired potentially because of "Organic Enrichment/ Low Dissolved Oxygen" and 80,135 acres of Illinois lakes are potentially impaired by this cause. (Ex A)[5] Although other sources of pollution certainly contributed to this problem, the Illinois 303(d) list of impaired waters (http://www.epa.state.il.us/water/watershed/reports/303d-report/2002-report/303d-report-2002.pdf), also released after the July 25 hearing, plainly indicates that industrial point sources (Code 100 in source column) and municipal point sources (Code 200) are playing a role in the low dissolved oxygen impairment of many waters across Illinois including Maucopin Creek, Lake Springfield, the Des Plaines River, the Fox River, Salt Creek (Du Page), the East Branch of the Du Page River, Marion Lake, the Big Muddy River, the Sangamon River, Rend Lake, Cedar Creek, and Addison Creek. 81 miles of the Illinois River are listed as potentially impaired by "Organic Enrichment/Low Dissolved Oxygen" with the source of this pollution listed as "unknown." (p.33). Given the level of municipal discharge to the Illinois River, point sources certainly constitute at least some part of the unknown.

The above figures on dissolved oxygen violations understate the problem. Only 18% of Illinois waters have been monitored. Further, as we have been informed by IEPA, its monitoring network was established to avoid taking samples near known point sources. [6]

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[4] Adoption of the Illinois EPA proposal will not actually loosen the effluent limits as to municipal discharges as the Agency did that by itself without Board approval in the 1980s.

[5] The Illinois Water Quality Report 2002 also has separate listings for waters potentially impaired by nutrients. 3082 miles of Illinois streams and 114,903 acres of Illinois lakes are potentially impaired by these inadequately regulated pollutants. (Ex. A) Nutrients not only cause violations of the dissolved oxygen standard, but cause algal blooms that violate Illinois standards against offensive conditions.

[6] Naturally, it is not known how many of the impairments listed in Illinois Water Quality Report would be present if the dissolved oxygen standards were weakened in the manner that the Illinois Association of Wastewater Agencies has

B. Illinois can practically do more to protect its waters against discharges of deoxygenating wastes.

That so many Illinois waters are impaired at least in part by regulated point sources is not the result of uncontrollable forces. Although there is a sizable contribution to BOD from nitrogenous compounds, IEPA admits that it essentially never regulates ammonia discharges to prevent violations of dissolved oxygen standards. (Mosher Testimony, March 6, 2002, Tr. 34).

Further, Illinois has not performed modeling or taken other steps to assure that authorized discharges do not cause or contribute to violations of dissolved oxygen standards for decades. (Frevert Testimony July 25 Tr.75-6) Other states do so. As explained by the Michigan Department of Environmental Quality:

> Typically, CBOD5 limits are placed in NPDES permits for all facilities which have the potential to contribute significant quantities of oxygen consuming substances to waters of the state. These limits are developed in direct correlation with limits for ammonia nitrogen and dissolved oxygen.
>
> ...
>
> In determining CBOD5 limits, stream modelers use computer models which simulate actual stream conditions. Model inputs include the flow of the receiving stream, the quantity of water to be discharged, the decay rate for the particular type of wastewater, the stream's slope, and temperature. Other upstream or downstream dischargers are also considered in the model. The modeler determines maximum limits for CBOD5 and ammonia nitrogen and minimum limits for dissolved oxygen. These limits are selected to insure that Water Quality Standards for dissolved oxygen are met in the receiving water. (Ex.C)[7]

The only steps that Illinois takes to protect against violations of dissolved oxygen standards are the provisions of Section 304.120 (b), which requires effluent limits of 20 mg/L BOD5 if a discharger has an untreated waste load of 10,000 population units or more, and Section 304.120(c), which generally requires limits of 10 mg/L BOD5 if the dilution ratio is less than five to one. The Environmental Groups continue to believe that these provisions should not be weakened.

What is really needed are rules that require use of modeling or other means to assure that permits are not issued that allow discharges that cause or contribute to violations of dissolved oxygen standards. At a minimum, if "CBOD5" is substituted for "BOD5", adjustments should be made that recognize that CBOD5 does not make up all of BOD5.

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suggested. However, until the IAWA makes a proposal for new standards and proves their scientific validity, the Board certainly cannot make decisions based on the standards that IAWA wishes existed.

[7] It is claimed that Illinois now approaches this problem through use of total maximum daily load studies, but IEPA has never completed a TMDL. (Frevert Testimony July 25 Tr.76) Even if IEPA actually did TMDLs, this would not be an acceptable approach because TMDLs are never attempted in Illinois until an impairment is found. Perhaps naively, we would like to prevent impairments from occurring in the first place.

This is particularly the case as to Section 304.120(b). The Board on numerous occasions has recognized that CBOD5 limits well below 20 mg/L are readily attainable by almost all dischargers. See Post Hearing Comments of ELPC, PRN and Sierra Club, filed 4-12-02, p. 8 fn. 12.

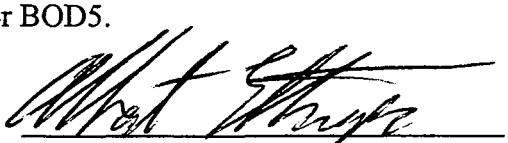
At the July 25, 2002 hearing, Mr. Callahan, spokesman for the Illinois Association of Wastewater Agencies, addressed his testimony made in the March hearing that effluents at the 10 mg/L CBOD5 level are "readily attainable ... with moderately appropriate user fees and citizens tax rates" (March Tr. 131), and implied that he had somehow been misquoted. Mr. Callahan protested that "I am not on the record intentionally of indicating that a secondary treatment process can consistently produce a 10 milligram per liter BOD." (Callahan testimony, July 25 Tr. 43).

Mr. Callahan is correct that he is not on the record as saying a secondary treatment plant can meet a 10 mg/L BOD standard but then no one said he did. For purposes of this proceeding, no one should care if he ever said that or not. The critical question for the Illinois environment is what can be done at an economically reasonable expense to address Illinois's dissolved oxygen problems (and offensive conditions, as defined by 35 Ill. Adm.302.203, caused by point source discharges). On that question, Mr. Callahan's March testimony and numerous other authorities agree that there is no reason to allow effluents as bad a 20 mg/L CBOD5 if there is any risk that the discharge will cause or contribute to violations of Illinois water quality standards. An effluent of 10 mg/L CBOD5 is readily attainment at a reasonable cost.

CONCLUSION

Consideration of changes to Illinois cyanide standard should be left until such time as there is more information on the potential effects of cyanide on rare Illinois mussels and other endangered species.

IEPA's proposal regarding effluent limits for deoxygenating wastes should be adopted as to technology-based requirement of 35 Ill. Adm. Code 304.120(a). However, the Board should take action to assure that changes to Illinois regulations are not made that will increase the impairments to Illinois waters caused by discharges of deoxygenating wastes. IEPA should be required to use modeling or other means to analyze the total effect of discharges on dissolved oxygen levels. Alternatively, as has been proposed by the Environmental Groups in the past, the Board should moderate the effect of IEPA's proposal by recognizing that CBOD5 BOD5. Lower CBOD5 figures should be used when substituting for BOD5.



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Illinois
Environmental
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Bureau of Water
P.O. Box 19276
Springfield, IL 62794-9276

July 2002

IEPA/BOW/02-006

Illinois Water Quality Report 2002

Illinois Environmental Protection Agency

Bureau of Water

EXHIBIT A

Potential Causes of Use Impairment

Potential causes of impairment in streams are summarized, for all assessed uses, in Table 3-14.

Table 3-14. Potential Causes Of Use Impairment in Streams.

Cause Category	Impaired Miles
Ammonia (unionized)	70
Chlorine	14
Cyanide	110
Excessive Algal Growth	59
Flow Alterations	509
Habitat Alterations (other than flow)	2732
Metals	2228
Nitrates (for public water supply use only)	57
Non-priority Organics	68
Nutrients	3082
Oil and Grease	20
Organic Enrichment/Low Dissolved Oxygen	2962
Other Inorganics (fluoride)	30
Pathogens (fecal coliform bacteria)	2318
PCBs	2435
Pesticides (half life $\leq$ 90 days) (atrazine)	94
pH	685
Priority Organics	743
Salinity/TDS/Chlorides	643
Siltation	1978
Sulfates	414
Suspended Solids	1728
Thermal Modifications	9

Potential Causes of Use Impairment

Potential causes of use impairment for lakes are summarized below in Table 3-28.

Table 3-28. Potential Causes Of Use Impairment in Lakes.

Cause Category	Total Impairment	
	Number	Acres
Priority Organics	35	21,546
PCBs	22	23,668
Metals	20	16,494
Unionized Ammonia	9	3,557
Nutrients	169	114,903
pH	44	18,239
Siltation	109	98,523
Organic Enrichment/Low D.O.	59	80,135
Salinity/TDS/Chlorides	3	638
Thermal Modification	1	1,038
Habitat Alterations	6	2,396
Pathogens	8	4,787
Suspended Solids	80	84,635
Noxious Aquatic Plants	76	46,580
Excessive Algae Growth/Chlorophyll *a*	164	83,873
Exotic Species	21	1,668
Pesticides (half life #90 days)	4	2,259

Laboratories Capable of Performing Method 1677 Analysis

These laboratories are identified below for informational purposes only. This does not represent an exhaustive list, nor does it constitute endorsement by either EPA or DynCorp of any laboratory appearing on the list.

Analytical Services Laboratory, Inc.
1988 Triumph St.
Vancouver, B.C., Canada VSL1KS
Contact: Blair Easton
Phone: (604) 253-4188

Bayer Environmental Testing Services
State Route 2 North, P.O. Box 500
New Martinsville, WV 26155
Contact: John Sebroskie
Phone: (304) 455-4400
Fax: (304) 455-5134

Degussa Corporation
4 Pearl Ct.
Allendale, NJ 07401
Contact: Jag Chattopadhyay
Phone: (201) 818-3700

Delta Faucet Company
Chemistry Laboratory
Address Unknown
Contact: Mike Mosely
Phone: (812) 663-4433

Frontier Geosciences
414 Pontius North, Suite B
Seattle, WA 98109
Contact: Nicolas Bloom
Phone: (206) 622-6960
Fax: (206) 622-6870
Email: nicolasb@frontier.wa.com

Golden Sunlight Mines
453 MT Hwy. 2 East
Whitehall, MT 59759
Contact: Neil Gallagher
Phone: (406) 287-3257

Newmont Exploration Limited
Metallurgical Services
412 Wakara Way, Suite 210
Salt Lake City, UT 84108
Contact: Tom Patten

Phone: (801) 583-8974

OI Analytical
1556 Spring Street
Saint Helena, CA 94574
Contact: Mike Straka
Phone: (707) 963-1069
Fax: (707) 963-3335
Email: mstraka@oico.com

University of Nebraska
Department of Chemical Engineering
Beadle Center
Lincoln, NE 68588-0668
Contact: Dr. Ljiljana Solujic
Phone: (402) 472-4784

University of Nevada - Reno
Department of Chemical and Metallurgical Engineering
Mackay School of Mines/MS 168
Reno, NV 89557
No contact name or phone number (previous contact is Dr. Solujic at University of Nebraska)

State of Michigan
DEQ
Department of Environmental Quality

Surface Water Quality Division

Permits Section

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand, or BOD, is a measure of the quantity of oxygen consumed by microorganisms during the decomposition of organic matter. BOD is the most commonly used parameter for determining the oxygen demand on the receiving water of a municipal or industrial discharge. BOD can also be used to evaluate the efficiency of treatment processes, and is an indirect measure of biodegradable organic compounds in water.

Imagine a leaf falling into a stream. The leaf, which is composed of organic matter, is readily degraded by a variety of microorganisms inhabiting the stream. Aerobic (oxygen requiring) bacteria and fungi use oxygen as they break down the components of the leaf into simpler, more stable end products such as carbon dioxide, water, phosphate and nitrate. As oxygen is consumed by the organisms, the level of dissolved oxygen in the stream begins to decrease

Water can hold only a limited supply of dissolved oxygen and it comes from only two sources- diffusion from the atmosphere at the air/water interface, and as a byproduct of photosynthesis. Photosynthetic organisms, such as plants and algae, produce oxygen when there is a sufficient light source. During times of insufficient light, these same organisms consume oxygen. These organisms are responsible for the diurnal (daily) cycle of dissolved oxygen levels in lakes and streams.

If elevated levels of BOD lower the concentration of dissolved oxygen in a water body, there is a potential for profound effects on the water body itself, and the resident aquatic life. When the dissolved oxygen concentration falls below 5 milligrams per liter (mg/l), species intolerant of low oxygen levels become stressed. The lower the oxygen concentration, the greater the stress. Eventually, species sensitive to low dissolved oxygen levels are replaced by species that are more tolerant of adverse conditions, significantly reducing the diversity of aquatic life in a given body of water. If dissolved oxygen levels fall below 2 mg/l for more than even a few hours, fish kills can result. At levels below 1 mg/l, anaerobic bacteria (which live in habitats devoid of oxygen) replace the aerobic bacteria. As the anaerobic bacteria break down organic matter, foul-smelling hydrogen sulfide can be produced.

BOD is typically divided into two parts- carbonaceous oxygen demand and nitrogenous oxygen demand. Carbonaceous biochemical oxygen demand (CBOD) is the result of the breakdown of organic molecules such a cellulose and sugars into carbon dioxide and water. Nitrogenous oxygen demand is the result of the breakdown of proteins. Proteins contain sugars linked to nitrogen. After the nitrogen is "broken off" a sugar molecule, it is usually in the form of ammonia, which is readily converted to nitrate in the environment. The conversion of ammonia

to nitrate requires more than four times the amount of oxygen as the conversion of an equal amount of sugar to carbon dioxide and water.

When nutrients such as nitrate and phosphate are released into the water, growth of aquatic plants is stimulated. Eventually, the increase in plant growth leads to an increase in plant decay and a greater "swing" in the diurnal dissolved oxygen level. The result is an increase in microbial populations, higher levels of BOD, and increased oxygen demand from the photosynthetic organisms during the dark hours. This results in a reduction in dissolved oxygen concentrations, especially during the early morning hours just before dawn.

In addition to natural sources of BOD, such as leaf fall from vegetation near the water's edge, aquatic plants, and drainage from organically rich areas like swamps and bogs, there are also anthropogenic (human) sources of organic matter. If these sources have identifiable points of discharge, they are called point sources. The major point sources, which may contribute high levels of BOD, include wastewater treatment facilities, pulp and paper mills, and meat and food processing plants.

Organic matter also comes from sources that are not easily identifiable, known as nonpoint sources. Typical nonpoint sources include agricultural runoff, urban runoff, and livestock operations. Both point and nonpoint sources can contribute significantly to the oxygen demand in a lake or stream if not properly regulated and controlled.

Performing the test for BOD requires significant time and commitment for preparation and analysis. The entire process requires five days, with data collection and evaluation occurring on the last day. Samples are initially seeded with microorganisms and saturated with oxygen (Some samples, such as those from sanitary wastewater treatment plants, contain natural populations of microorganisms and do not need to be seeded.). The sample is placed in an environment suitable for bacterial growth (an incubator at 20° Celsius with no light source to eliminate the possibility of photosynthesis). Conditions are designed so that oxygen will be consumed by the microorganisms. Quality controls, standards and dilutions are also run to test for accuracy and precision. The difference in initial DO readings (prior to incubation) and final DO readings (after 5 days of incubation) is used to determine the initial BOD concentration of the sample. This is referred to as a BOD_5 measurement. Similarly, carbonaceous biochemical oxygen test performed using a 5-day incubation is referred to as a $CBOD_5$ test.

Water Quality Standards for BOD

Although there are no Michigan Water Quality Standards pertaining directly to BOD, effluent limitations for BOD must be restrictive enough to insure that the receiving water will meet Michigan Water Quality Standards for dissolved oxygen.

Rule 64 of the Michigan Water Quality Standards (Part 4 of Act 451) includes minimum concentrations of dissolved oxygen that must be met in surface waters of the state. This rule states that surface waters designated as coldwater fisheries must meet a minimum dissolved oxygen standard of 7 mg/l, while surface waters protected for warmwater fish and aquatic life must meet a minimum dissolved oxygen standard of 5 mg/l.

Biochemical Oxygen Demand Limitations in NPDES Permits

Typically, $CBOD_5$ limits are placed in NPDES permits for all facilities which have the potential to contribute significant quantities of oxygen consuming substances to waters of the state. These limits are developed in direct correlation with limits for ammonia nitrogen and dissolved oxygen. The nitrogenous oxygen demand is computed separately because of the difference in oxygen demand (as explained above) and because the rate of oxygen consumption over time varies

from carbonaceous oxygen demand. Ammonia is further considered separately because in sufficient levels (dependant upon several variables) it can also be toxic to living organisms.

In determining $CBOD_5$ limits, stream modelers use computer models which simulate actual stream conditions. Model inputs include the flow of the receiving stream, the quantity of water to be discharged, the decay rate for the particular type of wastewater, the stream's slope, and temperature. Other upstream or downstream dischargers are also considered in the model. The modeler determines maximum limits for $CBOD_5$ and ammonia nitrogen and minimum limits for dissolved oxygen. These limits are selected to insure that Water Quality Standards for dissolved oxygen are met in the receiving water.

Permit-related questions and comments? Contact Fred Cowles, cowlesf@michigan.gov
Web page maintained by Sean Syts, sytss@michigan.gov
Last revision: April 30, 2001

http://www.deq.state.mi.us/swq/permits/parameters/bod.html

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Home

CERTIFICATE OF SERVICE

I, Albert F. Ettinger, certify that I have filed the above Notice of Filing together with an original and 9 copies of the Post-Second Hearing Comments of Environmental Law and Policy Center, Prairie Rivers Network and Sierra Club, on recycled paper, with the Illinois Pollution Control Board, James R. Thompson Center, 100 West Randolph, Suite 11-500, Chicago, IL 60601, and served all the parties on the attached Service List by depositing a copy in a properly addressed, sealed envelope with the U.S. Post Office, Chicago, Illinois, with proper postage prepaid on September 6, 2002.

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