

**SUMMARY:** Notice is hereby given that a proposed prospective purchaser agreement associated with the Oronogo-Duenweg Mining Belt Superfund Site, located in Jasper County, Missouri, was executed by the Agency on December 29, 1999. The Site is part of an inactive lead and zinc mining area known as the Tri-State Mining District. The Site encompasses approximately 270 square miles, with large volumes of abandoned and uncontrolled mining wastes spread throughout the Site. The mining wastes at the Site contain elevated levels of lead, which is a hazardous substance as defined by the Comprehensive Environmental Response, Compensation and Liability Act of 1986 ("CERCLA"). The Prospective Purchaser Agreement would resolve certain potential EPA claims under CERCLA against the Missouri Highway Transportation Commission ("MHTC"), the prospective purchaser ("the purchaser").

The settlement requires the purchaser to utilize large quantities of materials from past mining activities as fill, which would become part of the construction of the "Rangeline Bypass." The purchaser must ensure that upon completion of construction, clean cover is in place over all mine materials. The purchaser will handle the mine material in accordance with a work plan that is designed to ensure that contamination is not spread during construction. The purchaser agrees to provide to EPA access to the property. EPA may at any time conduct an inspection of the property, including sampling, to ensure the work is being performed in accordance with the work plan.

For thirty (30) days following the date of publication of this document, the Agency will receive written comments relating to the proposed settlement.

**DATES:** Written comments must be submitted on or before February 18, 2000.

**ADDRESSES:** Comments should reference the "Oronogo-Duenweg Mining Belt Superfund Site" and should be forwarded to D. Mark Doolan, Remedial Project Manager, U.S. Environmental Protection Agency, Region VII, 901 North 5th Street, Kansas City, Kansas 66101. A copy of the proposed agreement may be obtained from Venessa Cobbs (913) 551-7630.

**FOR FURTHER INFORMATION CONTACT:** David Cozad, Senior Associate Regional Counsel, United States Environmental Protection Agency, Region VII, 901 North 5th Street, Kansas City, Kansas 66101, (913) 551-7587.

Dated: January 4, 2000.

**Dennis Grams,**

*Regional Administrator, Region 7.*

[FR Doc. 00-1213 Filed 1-18-00; 8:45 am]

**BILLING CODE 6560-50-P**

## ENVIRONMENTAL PROTECTION AGENCY

[FRL-6526-3]

### Water Quality Criteria: Notice of Draft Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Notice of availability of Draft Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras.

**SUMMARY:** Pursuant to section 304(a)(1) of the Clean Water Act (CWA), the Environmental Protection Agency announces the availability of a draft document titled, Draft Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras. The EPA is considering using the values presented in this document as its recommended national 304(a) criteria for dissolved oxygen in saltwater. These 304(a) criteria would provide recommended guidance values for States, Territories, and authorized Tribes to use in adopting water quality criteria to protect aquatic life from acute and chronic effects of low dissolved oxygen. Under the CWA, States, Territories, and Tribes are to adopt water quality criteria to protect designated uses. As the document is currently written, these water quality criteria would apply only to the Virginian Province (Cape Cod to Cape Hatteras), but with appropriate modifications, they may be applicable to other regions. While these criteria would constitute EPA's scientific recommendations regarding ambient concentrations of dissolved oxygen that protect saltwater aquatic life, these criteria are not regulations; thus they would not impose legally binding requirements on EPA, States, Territories, Tribes, or the public, and might not apply to a particular situation based upon the circumstances. State, Territories, and authorized Tribes retain the discretion to adopt, where appropriate, other scientifically defensible water quality standards that differ from these recommendations. EPA may change these 304(a) criteria in the future.

These draft criteria were under development prior to the Agency's

revision and implementation of its current processes for notice of data availability and criteria development (see **Federal Register**, December 10, 1998, 63 FR 68354 and in the EPA document titled, National Recommended Water Quality—Correction EPA 822-Z-99-001, April 1999). As indicated in the December 10, 1998 FR document, the Agency believes it is important to provide the public with an opportunity to submit scientific information on draft criteria, even though we are not required to invite nor respond to specific issues. Therefore, EPA will review and consider significant scientific information submitted by the public that might not have otherwise been identified during development of these criteria, or in the external peer review. The external peer review comments and EPA's responses are available in the Water Docket. After review of the submitted significant scientific information, EPA will publish a revised document, or publish a document indicating its decision not to revise the document.

This draft document has been approved for publication by the Office of Science and Technology, Office of Water, U.S. Environmental Protection Agency. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

**DATES:** All significant scientific information must be submitted to the Agency within 45 days after publication of this document in the **Federal Register** under docket number W-99-22. The Administrative Record supporting this guidance document, including results of the peer review is available at the Water Docket, Room EB-57, Environmental Protection Agency, 401 M Street SW, Washington, DC 20460 on Monday through Friday, excluding Federal holidays, between 9:00 a.m. and 4:00 p.m. For access to docket materials call (202) 260-3027 for an appointment. A reasonable fee will be charged for photocopies. Any scientific information submitted should be adequately documented and contain enough supporting information to indicate that acceptable and scientifically defensible procedures were used and that the results are likely reliable.

**ADDRESSES:** Copies of the complete document, titled Draft Ambient Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras can be obtained from EPA's Water Resource Center by phone at 202-260-7786, or by e-mail to [center.water-resources@epa.gov](mailto:center.water-resources@epa.gov) or by conventional mail to EPA Water Resource Center, RC-

4100, 401 M Street SW, Washington, DC 20460. Alternatively, consult [www.epa.gov/OST/standards/](http://www.epa.gov/OST/standards/) for download availability.

An original and two copies of written significant scientific information should be submitted within 45 days after publication in the **Federal Register**, and addressed to W-99-22, Saltwater Dissolved Oxygen Criteria Clerk; Water Docket (MC-4101), U.S. EPA, 401 M Street SW, Washington, DC 20460. Issues may be submitted electronically in ASCII or Word Perfect 5.1, 5.2, 6.1, or 8.0 formats to OW-Docket@epamail.epa.gov.

**FOR FURTHER INFORMATION CONTACT:** Erik L. Winchester, USEPA, Health and Ecological Criteria Division (4304), Office of Science and Technology, 401 M Street, SW, Washington, DC 20460; or call (202) 260-6107; fax (202) 260-1036; or e-mail [winchester.erik@epa.gov](mailto:winchester.erik@epa.gov).

#### **SUPPLEMENTARY INFORMATION:**

#### **Introduction**

Section 304(a)(2) of the CWA calls for information on the conditions necessary "to restore and maintain biological integrity of all \* \* \* waters, for the protection and propagation of shellfish, fish and wildlife, to allow recreational activities in and on the water, and to measure and classify water quality." The EPA has not previously issued saltwater criteria for dissolved oxygen (D.O.) because, until recently, the available effects information was insufficient. This draft document is the result of a research effort to produce sufficient information to support the development of saltwater D.O. criteria. The draft water quality criteria presented herein represent EPA's best estimates, based on the data available, of D.O. concentrations necessary to protect aquatic life and uses associated with aquatic life.

#### **Overview of the Problem**

EPA's Environmental Monitoring and Assessment Program (EMAP) for the estuaries in the Virginian Province (defined as Cape Cod to Cape Hatteras) has shown that 25% of the area of the Province is exposed to some degree to D.O. concentrations less than 5 mg/L. EMAP also has generated field observations that correlate many of the biologically degraded benthic areas with low D.O. in the lower water column. These two reports serve to emphasize that low D.O. (hypoxia) is a major concern within the Virginian Province. Hypoxia is defined in this document as the reduction of D.O. concentrations below air saturation. Even though hypoxia is a major concern, a strong

technical basis for developing benchmarks for low D.O. effects has been lacking until recently.

In the Virginian Province, hypoxia is essentially a warm water phenomenon. In the southern portions of the Province, such as the Chesapeake Bay and its tributaries, reduced D.O. may occur any time between May and October; in the more northern coastal and estuarine waters, it may occur at any time from late June into September. Hypoxic events can occur on seasonal or diel (daily) time scales. Seasonal hypoxia often develops as a consequence of water column stratification, which prevents mixing of well oxygenated surface water with deeper water. Diel cycles of hypoxia often occur in non-stratified shallow habitats where nighttime respiration temporarily depletes D.O. Hypoxia may also persist more or less continuously over a season (with or without a cyclic component) or be episodic (*i.e.*, of irregular occurrence and indefinite duration). The fauna most at risk from hypoxic exposure in the Virginian Province are primarily summer inhabitants of subpycnocline (*i.e.*, bottom) waters.

#### **Biological Effects of Low Dissolved Oxygen**

Oxygen is essential in aerobic organisms for the electron transport system of mitochondria. Oxygen insufficiency at the mitochondria results in reduction in cellular energy and a subsequent loss of ion balance in cellular and circulatory fluids. If oxygen insufficiency persists, death will ultimately occur, although some aerobic animals also possess anaerobic metabolic pathways, which can delay lethality for short time periods (minutes to days). The animals most sensitive to hypoxia are those inhabiting well oxygenated environments.

#### **Overview of the Protection Approach**

The approach to determine D.O. criteria to protect saltwater animals within the Virginian Province takes into account both continuous (*i.e.*, persistent) and cyclic (*e.g.*, diel, tidal, or episodic) exposures to low D.O. The continuous situation considers exposure durations of 24 hours or greater. Criteria for cyclic situations would cover hypoxic exposures of less than 24 hours, but which may be repeated over a series of days. Both scenarios cover three areas of protection (summarized here, and explained in more detail in the document):

- (1) Protection for juvenile and adult survival,
- (2) Protection for chronic (growth) effects, and

(3) Protection for larval recruitment effects (estimated with a generic model).

The approach to derive these draft water quality criteria combines features of traditional water quality criteria with a new biological framework that integrates time (replacing the concept of an averaging period) and establishes separate protection limits for different life stages (*i.e.*, larvae versus juveniles and adults). Where practical, data were selected and analyzed in manners consistent with the Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (hereafter referred to as the Guidelines).

With the three areas of protection in mind, the draft saltwater D.O. criteria segregate effects on juveniles and adults from those on larvae. The survival data on the sensitivity of the former are handled in a traditional Guidelines manner. The cumulative effects of low D.O. on larval recruitment to the juvenile life stage, on the other hand, would address survival effects on larvae. In the draft document the recommended approach for deriving D.O. criteria uses a mathematical model to evaluate the effect of D.O. conditions on larvae by tracking intensity and duration effects across the larval recruitment season. Protection for larvae of all species is provided by using data for a sensitive aquatic organism (larval stage of the Say mud crab, *Dyspanopeus sayi*). The model is used to generate a draft D.O. criterion for larval survival as a function of time.

For the reasons listed above, the recommended draft D.O. criteria approach deviates somewhat from EPA's traditional approach for toxic chemicals outlined in the Guidelines. However, where practical, data selection and analysis procedures are consistent with the Guidelines. Although most of the terminology and the calculation procedures are the same, knowledge of the Guidelines is useful for a more complete understanding of how these draft D.O. criteria are derived.

The draft juvenile/adult survival and the growth criteria would provide useful screening boundaries within which to judge the D.O. status of a given site. If the D.O. conditions are above the chronic growth criterion (4.8 mg/L), then this site would meet objectives for protection. If the D.O. conditions are below the juvenile/adult survival criterion (2.3 mg/L), then this site would not meet objectives for protection. When the D.O. conditions are between these two values, then the site would require evaluation, using the model, of duration and intensity of hypoxia to determine

suitability of habitat for the larval recruitment objective.

The draft D.O. criteria are based entirely on laboratory findings. However, field observations support the findings of laboratory studies. Field acute effects occurred in juvenile and adult animals at <2.0 mg/L, which would be predicted based on the <2.3 mg/L juvenile/adult criterion. In the field, behavioral effects generally occurred within the range where many of the laboratory sublethal effects occurred. However, an important limitation of using field observations to describe D.O. protection is the absence of field observations on the survival and growth of hypoxic sensitive larvae. This type of information is critical since two of the three goals for protection are derived from responses of larvae.

#### Implementation Overview

Implementation of draft D.O. criteria may be slightly different from that of chemical toxicants, but not for reasons associated with either biological effects or exposure. The primary reason that D.O. might be implemented differently from toxic compounds is because controlling the effects of low D.O. is not accomplished by directly regulating D.O. Rather, hypoxia is a symptom of a problem, not the direct problem. Thus dissolved oxygen would be regulated primarily through the control of nutrients (e.g., nitrogen and phosphorus) and oxygen demanding wastes. As a stressor, D.O. also differs from most toxic compounds in that there can be a large natural component to the cause of hypoxic conditions in any given water body. Dissolved oxygen criteria may be appropriately used in a risk assessment framework. The draft criteria and management approach presented in this document could be used to compare D.O. conditions among areas and determine if D.O. conditions would be adequate to support aquatic life. Environmental managers could determine which sites need the most attention, and what is the spatial and temporal extent of hypoxic problems from one year to the next. Finally, environmental planners could use the draft approach to evaluate how conditions would improve under different management scenarios, helping them make better management decisions.

#### Limitations of the Document

The geographic scope of the draft criteria are limited to the Virginian Province of the Atlantic coast of the United States (i.e., southern Cape Cod, MA, to Cape Hatteras, NC). The draft document provides the necessary

information for environmental planners and regulators within the Virginian Province to address the question: are the D.O. conditions at a given site sufficient to protect coastal or estuarine aquatic life? The approach outlined in the draft document could be used to evaluate existing localized D.O. standards or management goals or establish new ones. The draft criteria do not address direct behavioral responses (i.e., avoidance) or the ecological consequences of behavioral responses, such as increased or decreased predation rates or altered community structure, nor do they address the issue of spatial significance of a D.O. problem. In addition, as with all criteria, the draft criteria do not account for changes in sensitivity to low D.O. that accompany other stresses, such as high temperature, extremes of salinity, or toxicants. Chief among these concerns would be high temperature because high temperature and low D.O. often appear together. Low D.O. would be more lethal at water temperatures approaching the upper thermal limit for species. The limits provided in the draft document should be sufficient under most conditions where aquatic organisms are not otherwise unduly stressed.

The draft criteria for the Virginian Province may be over- or under-protective of aquatic life in other regions. However, the approach used to develop the draft criteria is considered to be applicable to other regions with appropriate regional modifications. Organism adaptations to lower oxygen requirements may have occurred in locations where oxygen concentrations have historically been reduced due to high temperatures, or in systems with non-anthropogenic high oxygen demand. Conversely, organisms in another region could be adapted to colder temperature and higher dissolved oxygen regimes than those covered in the document, and thus may have different sensitivity to dissolved oxygen concentrations. In addition, effects of hypoxia may vary latitudinally, or site-specifically, particularly as reproductive seasons determine exposure risks for sensitive early life stages. For these reasons, an environmental risk manager would be to carefully evaluate water quality and biological conditions within the specific location and decide if the Virginian Province criteria would apply or if region- or site-specific considerations would need to be made.

#### Endangered or Threatened Species Policy Recommendations

When a threatened or endangered species occurs at a site and sufficient data indicate that it is sensitive at

concentrations below the recommended criteria, it would be appropriate to consider deriving a site-specific criterion.

#### Future Addendum and Applications

In addition to publishing this document, an addendum will be published in the near future that will specifically address implementation issues. In the current draft document, implementation issues are discussed in a more general manner, summarizing important issues that environmental managers should consider in adopting and implementation of D.O. water quality standards. The addendum will provide a more detailed discussion of implementation issues by using real world example data sets. Application of this guidance to marine waters outside the Virginian Province will also be discussed. As a component of the addendum, EPA will also publish a computer program that will allow Sates and other users to calculate D.O. criteria values for coastal and estuarine animals. The program will be based on the models discussed in the criteria document and will contain a graphic user interface. EPA anticipates publication of the Addendum and computer model to occur sometime in 2000.

EPA believes the approach used to develop the draft criteria can be applied, with minor modifications and regional specific data, to derive D.O. criteria for other coastal and estuarine regions of the United States. Therefore, in the future, EPA plans to prepare similar D.O. criteria for other provinces based on this approach. At such time, EPA will publish a Notice of Data Availability and formally request submission of data from parties interested in the development of D.O. criteria for other provinces.

Dated: January 10, 2000.

**Geoffrey H. Grubbs,**

*Director, Office of Science and Technology.*

[FR Doc. 00-1211 Filed 1-18-00; 8:45 am]

BILLING CODE 6560-50-P

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#### FEDERAL COMMUNICATIONS COMMISSION

[DA 00-43]

**Auction of Licenses in the 747-762 and 777-792 MHz Bands Scheduled for May 10, 2000; Report No. AUC-99-31-A (Auction No. 31)**

**AGENCY:** Federal Communications Commission.

**ACTION:** Notice.

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