Title 11: Mississippi Department of Environmental Quality

Part 3: Hazardous Waste Management Regulations

Part 3, Chapter 5: Mississippi Commission on Environmental Quality Groundwater Quality Standards (Adopted November 21, 1991)

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Rule 5.1 Introduction (Adopted November 21, 1991).

Mississippi groundwaters are among the basic resources of the state. They are utilized for many economically beneficial purposes, including agricultural irrigation, aquaculture, livestock watering, & industrial manufacturing. The most critical use, however, is that it serves as the principal source of drinking water in the state. In fact, over 90% of the population of the state utilizes groundwater as its potable water supply. Therefore, the standards adopted herein focus on preserving the quality of the groundwater as a drinking water resource. In doing so, it is generally believed that other uses will be adequately protected. It is the policy of the Commission on Environmental Quality that where alternate technology is available, groundwater should not be used for wastewater disposal. Therefore, the standards adopted herein should not be misconstrued to allow or condone deliberate, limited degradation of groundwater from disposal practices that can be avoided with alternate technology.

Source: *Miss. Code Ann. §§ 17-17-1, et seq., 49-2-9 (1)(b), 49-2-1, et seq. and 49-17-1, et seq.*

Rule 5.2 Applicability.

The standards adopted herein are applicable to all groundwater aquifers with a total dissolved solids (TDS) concentration less than 10,000 mg/l, except those incapable of yielding an adequate volume of water to serve the potable water needs of an average residence using standard well construction and pumping technology. Generally, the soil water (unsaturated zone) and the saturated water found in clay or shale formations (aquitards) do not yield water in sufficient quantities to be used as a potable water supply, and the standards incorporated herein are not intended to apply to such waters. However, some protection or remediation of these waters will be necessary, particularly if it is determined that they may be interconnected with other

groundwater and thus impact the chemical quality of that water. Also, it is recognized that the implementation of federal programs such as Subtitle C of the Resource, Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) may require the applicability of these or more stringent standards to all groundwater.

Source: *Miss. Code Ann. §§ 17-17-1, et seq., 49-2-9 (1)(b), 49-2-1, et seq. and 49-17-1, et seq.*

Rule 5.3 Numerical Groundwater Standards.

Groundwater is expected to meet the water quality standards equivalent to the Maximum Contaminant Level (MCL) of any constituent, as established by the Environmental Protection Agency (EPA). Table 1 is a list of those chemicals for which EPA has promulgated MCL's. As EPA adopts additional or different MCL's, this table will be revised and updated accordingly. For chemicals with no established MCL, the water quality standard shall be calculated using the procedure outlined in this section.

A. Carcinogens

(1) A water quality standard may be calculated from Risk-Specific Doses (RSD's) developed according to EPA Guidelines for Carcinogen Risk Assessment. The RSD is an upper bound estimate of the average daily dose of a carcinogenic substance that corresponds to a specified excess cancer risk for lifetime exposure. The standards calculated are derived from the following basic formula:

RSD = (R/q1) x (W/I) Equation (1)

Where:

RSD = the Risk Specific Dose, or standard for the toxicant of interest;

R = the specified risk level (e.g. 10-6);

q1 = the carcinogen slope factor (CSF) in (mg/kg/day)-1 developed by the Carginogen Assessment Group (CAG) of the EPA, Office of Health & Environmental Assessment, or the EPA's Carcinogen Risk Assessment Verification Endeavor (CRAVE) Workgroup;

W = the assumed weight of the exposed individual; and

I = the intake amount for a given time period.

(2) For purposes of calculating groundwater quality standards, it is assumed that the weight of the exposed individual (W) will be 70 kg & that the intake rate (I) will be 2 liters/day over a lifetime. Therefore, equation (1) is reduced to:

RSD = 35 x R/q1 Equation (2)

(3) Except as provided in Paragraph E of this section, the standard calculated from Equation (2) shall correspond to a risk level (R) of no less than 10-6 for Class A & B carcinogens, or 10-5 for Class C carcinogens.

B. Systemic Toxicants

(1) A water quality standard may be calculated from Reference Doses (RfD's) developed according to EPA accumulated data describing noncarcinogenic end points of toxicity. The RfD is an estimate of the daily exposure an individual (including sensitive individuals) can experience without appreciable risk of health effects during a lifetime. The standards calculated are derived from the following basic formula:

C = (RfD) x (W/I) x (RSC) Equation (3)

where:

C = concentration for the toxicant of interest;

RfD = Reference Dose in mg/kg/day;

W = the assumed weight of the exposed individual;

I = the intake amount for a given time period; and

RSC = Relative Source Contribution, or the fraction of the overall exposure contributed by ingestion of water over the lifetime of an individual.

(2) For purposes of calculating groundwater quality standards, it is usually assumed that the weight of the exposed individual (W) will be 70 kg and that the intake rate (I) will be 2 liters/day over a lifetime. Therefore, Equation (3) is reduced to:

C = 35 x RfD X RSC Equation (4)

The Relative Source Contribution (RSC) may vary widely with each application of Equation (4). Again, for purposes of calculating a groundwater quality standard, it should be assumed that ingestion from drinking water contributes a minimum of 20% of the overall exposure of a specific contaminant over the lifetime of an individual. If, however, there is information indicating that ingestion represents a higher fraction of the overall exposure, the RSC value may be adjusted, but in no case should it exceed 80%.

C. TOXICANTS WHICH ARE BOTH CARGINOGENS & SYSTEMICALLY TOXIC

Some toxicants may be both carginogenic and systemically toxic. In such cases, the lower of the two values as calculated by Equations (1) - (4) shall be the standard.

D. DETECTION LIMITS

In cases where the calculated standard is below the current analytical detection limit, the standard shall be the detection limit.

E. ALTERNATIVE STANDARDS

(1) For remedial purposes only, the Commission on Environmental Quality may establish an alternative standard (AS) in lieu of the calculated standard, as long as:

(a) the AS established is based upon human health criteria; and

(b) the AS does not exceed a lifetime cancer risk level of 10-4.

(2) Environmental, technological, and economic factors, as well as consistency with EPA regulations and guidance may be considered in establishing an AS.

(3) An AS may be site specific or for a group of remedial sites with similar characteristics.

Source: *Miss. Code Ann. §§ 17-17-1, et seq., 49-2-9 (1)(b), 49-2-1, et seq. and 49-17-1, et seq.*

Rule 5.4 Table 1 – Numerical Groundwater Standards.

Contaminant	Standard (PPB)
Alachlor	2
Aldicarb	3
Aldicarb Sulfone	2
Aldicarb Sulfoxide	4
Antimony	6
Arsenic	50
Atrazine	3
Barium	2,000
Benzene	5
Benzo(a) pyrene	0.2
Beryllium	4
Cadmium	5
Carbofuran	40
Carbon Tetrachloride	5
Chlordane	2
Chromium	100

Cyanide	200
2,4-D	70
Dalapon	200
Dibromochloropropane (DBCP)	0.2
o-Dichlorobenzene	600
p-Dichlorobenzene	75
1,2-Dichloroethane	5
1,1-Dichloroethylene	7
cis-1,2-Dichloroethylene	70
trans-1,2-Dichloroethylene	100
Dichloromethane (Methylene Chloride)	5
1,2-Dichloropropane	5
Di(2-ethylhexyl)adipate	400
Di(2-ethylhexyl)phthalate	6
Dinoseb	7
Diquat	20
Endothall	100
Endrin	2
Ethylbenzene	700
Ethylene Dibromide (EDB)	0.05
Fluoride	4
Glyphosate	700
Heptachlor	0.4
Heptachlor Epoxide	0.2
Hexachlorobenzene	1
Hexachlorocyclopentadiene	50
Lead	50
Lindane	0.2
Mercury	2
Methoxychlor	40
Monochlorobenzene	100
Nickel	100
Nitrates (as N)	10,000
Nitrites (as N)	1,000
Nitrites & Nitrates (as N)	10,000
Oxamyl (Vydate)	200
Pentachlorophenol	1
PCB's	0.5
Picloram	500
Selenium	50
Silver	50
Simazine	4
Styrene	100

2,3,7,8-TCDD (Dioxin)	0.00003
2,4,5-TP	50
Tetrachloroethylene	5
Thallium	2
Toluene	1,000
Toxaphene	3
1,2,4-Trichlorobenzene	70
1,1,1-Trichloroethane	200
1,1,2-Trichloroethane	5
Trichloroethylene	5
Vinyl Chloride	2
Xylene	10,000