STATE OF MISSISSIPPI
HALEY BARBOUR
GOVERNOR
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TRUDY D. FISHER, EXECUTIVE DIRECTOR

April 2, 2008

Ms. Keriema S. Newman
Remedial Project Manager
CERCLA Section
US EPA Region IV.
61 Forsyth Street
Atlanta, Ga 30303-8960.

Re: Identification of State ARAR's
Sonford Products Superfund Site
Flowood, Rankin County, Mississippi

Dear Ms. Newman:

In Response to your letter of March 13, 2008 requesting notification of state specific ARAR's, the State of Mississippi provides the following list. It is noted that the following list of ARAR's are in addition to other Federal Environmental and Natural Resources Acts/laws.

Mississippi Ambient Water Quality Criteria, Environmental Permits Division

Mississippi Ambient Air Quality Standards (APC-s-4), Environmental Permits Division

Mississippi Brownfield Voluntary Cleanup and Redevelopment Act, April 1998, MS Code Section 4935-1.

A list of cleanup criteria /standards for each ARAR may be found on the Mississippi Department of Environmental Quality website (www.mdeq.state.ms.us) or by calling (601) 961-5171.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Phillip Weathersby
CERCLA Section Chief

OFFICE OF POLLUTION CONTROL
POST OFFICE BOX 2261 • JACKSON, MISSISSIPPI 39225-2261• TEL: (601) 961-5171 • FAX: (601) 354-6612 • www.deq.state.ms.us
AN EQUAL OPPORTUNITY EMPLOYER

STATE OF MISSISSIPPI
WATER QUALITY CRITERIA FOR INTRASTATE, INTERSTATE, AND COASTAL WATERS

Adopted by Mississippi Commission on Environmental Quality: August 23, 2007

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF POLLUTION CONTROL
P. O. Box 10385
Jackson, Mississippi 39289-0385
(601) 961-5171
www.deq.state.ms.us

STATE OF MISSISSIPPI
WATER QUALITY CRITERIA FOR INTRASTATE, INTERSTATE, AND COASTAL WATERS

SECTION I. GENERAL CONDITIONS:

1. Antidegradation: The policy inherent in the standards shall be to protect water quality existing at the time these water quality standards were adopted and to upgrade or enhance water quality within the State of Mississippi. Waters whose existing quality is better than the established standards will be maintained at high quality unless the Commission finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In no event, however, may degradation of water quality interfere with or become injurious to existing instream water uses. Further, in no case will water quality be degraded below (or above) the base levels set forth in these standards for the protection of the beneficial uses described herein. In addition, the State will assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control. Where the Commission determines that high quality waters constitute an outstanding National resource, such as waters of National and State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. For the purposes of this section, existing uses are defined as those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the Water Quality Criteria.

2. Sampling and Assessment: The limiting values of water quality herein described shall be measured by the Commission in waters under consideration as determined by good environmental engineering and scientific practice and after consultation with affected parties. Samples shall be taken from points so distributed over the seasons of the year, time of day, and area and depth of the waters being studied as to permit a realistic assessment of water quality.

   Samples shall be analyzed in accordance with methodology specified in 40 CFR 136 and with the latest edition of *Standard Methods for the Examination of Water and Wastewater* or other methods acceptable to the Commission.

3. Designated Use Attainability: Certain waters of the State may not fall within desired or prescribed limitations as outlined. In such instances the Commission may authorize exceptions to these limits, under the following conditions:

A. the designated use is not attainable because of natural background conditions; or

B. the designated use is not attainable because of irretrievable man-induced conditions; or

C. the application of effluent limitations for existing point sources is more stringent than those required pursuant to Section 301(b)(2)(A) and (B) of the Federal Water Pollution Control Act of 1972, as amended, in order to attain the designated use, would result in substantial and widespread adverse economic and social impact.

In no case shall it be permissible to deposit or introduce materials into waters of the State that will cause impairment of the reasonable or legitimate use of said waters.

4. Natural Conditions: Natural conditions are defined as background water quality conditions due only to non-anthropogenic sources. The criteria herein apply specifically with regard to substances attributed to sources (discharges, nonpoint sources, or instream activities) as opposed to natural phenomena. Waters may naturally have characteristics outside the limits established by these criteria. Therefore, naturally occurring conditions that fail to meet criteria should not be interpreted as violations of these criteria.

5. New Criteria: In view of the fact that industry is continuing to produce new materials whose characteristics and effects are unknown at this time or for which incomplete national criteria have been established, for the purposes of setting water quality standards or permit limits on a case-by-case basis, such materials shall be evaluated on their merits as information becomes available to the Commission. Sources of information shall include, but not be limited to, the latest edition of *Quality Criteria for Water*, prepared by the Environmental Protection Agency pursuant to Section 304(a) of the Federal Clean Water Act.

6. Applicable Flow: All criteria contained herein shall apply to all stages of stream flow greater than or equal to the 7-day, 10-year minimum flow in unregulated, natural streams, and the legally guaranteed minimum flow in regulated streams, unless otherwise provided in these regulations. This requirement shall not be interpreted to permit any unusual waste discharges during periods of lower flow. Notwithstanding the above, a stream flow equal to the 7-day, 2-year minimum flow in unregulated natural streams shall be utilized in establishing permit limitations for storm water permits. In cases in which either (1) the data are indefinite or inconclusive, or (2) the 7-day, 2-year minimum flow and/or the 7-day, 10-year minimum flow are inappropriate because of the hydrology of the area, other appropriate State and federal agencies will be consulted in establishing the applicable stream flow.

7. Mississippi River: The Mississippi River is classified for Fish and Wildlife use, but with the following additions to the criteria stated herein:

   Mineral Constituents: Not to exceed the following concentrations at any time:
   From Mississippi-Tennessee border to Vicksburg

Chlorides	60 mg/l
Sulfates	150 mg/l
TDS	425 mg/l

   From Vicksburg south to the Mississippi-Louisiana border

Chlorides	75 mg/l
Sulfates	120 mg/l
TDS	400 mg/l

8. Mixing Zones: It is recognized that limited areas of mixing are sometimes unavoidable; however, mixing zones shall not be used as a substitute for waste treatment. Mixing zones constitute an area whereby physical mixing of a wastewater effluent with a receiving water body occurs. Application of mixing zones shall be made on a case-by-case basis and shall only occur in cases involving large surface water bodies in which a long distance or large area is required for the wastewater to completely mix with the receiving water body.

   The location of a mixing zone shall not significantly alter the designated uses of the receiving water outside its established boundary. Adequate zones of passage for the migration and free movement of fish and other aquatic biota shall be maintained. Toxicity and human health concerns within the mixing zone shall be addressed as specified in the *Environmental Protection Agency Technical Support Document for Water Quality-Based Toxics Control* (EPA-505/2-90-001, March 1991) and amendments thereof. Under no circumstances shall mixing zones overlap or cover tributaries, nursery locations, locations of threatened or endangered species, or other ecologically sensitive areas.

9. Coastal Recreational Waters: Coastal Recreational Waters are marine and estuarine waters that are suitable for recreational purposes, including such water contact activities as swimming, wading, and water skiing. Coastal recreational waters do not include inland waters upstream of the mouth of a river or a stream having a natural connection to the open sea. Water quality monitoring for bacteria content is conducted on these waters to protect the health of bathers. Water contact is discouraged on Mississippi's public access bathing beaches along the shoreline of Jackson, Harrison, and Hancock Counties when enterococci exceed 104 colonies per 100 ml and in all other coastal recreational waters when enterococci exceed 501 colonies per 100 ml. When enterococci counts exceed 104 per 100 ml at the public access beaches, water contact advisories are issued by Mississippi's Beach Monitoring Task Force.

SECTION II. MINIMUM CONDITIONS APPLICABLE TO ALL WATERS:

1. Waters shall be free from substances attributable to municipal, industrial, agricultural, or other discharges that will settle to form putrescent or otherwise objectionable sludge deposits.

2. Waters shall be free from floating debris, oil, scum, and other floating materials attributable to municipal, industrial, agricultural, or other discharges in amounts sufficient to be unsightly or deleterious.

3. Waters shall be free from materials attributable to municipal, industrial, agricultural, or other discharges producing color, odor, taste, total suspended or dissolved solids, sediment, turbidity, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated use. Except as prohibited in Section I, Paragraph 8 above, the turbidity outside the limits of a 750-foot mixing zone shall not exceed the background turbidity at the time of discharge by more than 50 Nephelometric Turbidity Units (NTU). Exemptions to the turbidity standard may be granted under the following circumstances:

    A. in cases of emergency to protect the public health and welfare

    B. for environmental restoration projects which will result in reasonable and temporary deviations and which have been reviewed and approved by the Department.

4. Waters shall be free from substances attributable to municipal, industrial, agricultural, or other discharges in concentrations or combinations that are toxic or harmful to humans, animals, or aquatic life. Specific requirements for toxicity are found in Section II.10.

5. Municipal wastes, industrial wastes, or other wastes shall receive effective treatment or control in accordance with Section 301, 306, and 307 of the Federal Clean Water Act. A degree of treatment greater than defined in these sections may be required when necessary to protect legitimate water uses.

6. Designated Use Classifications: A water body classified as Public Water Supply, Recreation, or Shellfish Harvesting shall meet not only the criteria to support its respective use classification, but also shall meet the Fish and Wildlife criteria in order to support aquatic life.

7. Dissolved Oxygen: Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l.

   When possible, samples should be taken from ambient sites according to the following guidelines:

   For waters that are not thermally stratified, such as unstratified lakes, lakes during turnover, streams, and rivers:

   At mid-depth if the total water column depth is 10 feet or less.
   At 5 feet from the water surface if the total water column depth is greater than 10 feet.

   For waters that are thermally stratified such as lakes, estuaries, and impounded streams:

   At mid-depth of the epilimnion if the epilimnion depth is 10 feet or less.
   At 5 feet from the water surface if the epilimnion depth is greater than 10 feet.

8. pH: The normal pH of the waters shall be 6.0 to 9.0 and shall not be caused to vary more than 1.0 unit within this range. Variations may be allowed on a case-by-case basis if the Commission determines that there will be no detrimental effect on the water body's designated uses as a result of the greater pH change. In black water streams and in those watersheds with highly acidic soils, the pH may be lower than 6.0 due to natural conditions.

9. Temperature: The maximum water temperature shall not exceed 90°F (32.2°C) in streams, lakes, and reservoirs, except that in the Tennessee River the temperature shall not exceed 86°F (30°C). In addition, the discharge of any heated waters into a stream, lake, or reservoir shall not raise temperatures more than 5°F (2.8°C) above natural conditions for temperatures.

   In lakes and reservoirs there shall be no withdrawals from or discharge of heated waters to the hypolimnion unless it can be shown that such discharge will be beneficial to water quality. In all waters the normal daily and seasonal temperature variations that were present before the addition of artificial heat shall be maintained.

   The maximum water temperature shall not exceed 90°F (32.2°C) in coastal or estuarine waters. In addition, the discharge of any heated waste into any coastal or estuarine waters shall not raise temperatures more than 4°F (2.2°C) above natural conditions for temperature during the period October through May nor more than 1.5°F (0.8°C) above natural background temperature during the period June through September.

   When ambient water temperatures naturally exceed 90°F (or 86°F in the Tennessee River), the discharge temperature of heated water must not exceed the ambient water temperature.

There shall be no thermal block to the migration of aquatic organisms. Requirements for zones of passage as referenced in Section I.8 shall apply. In addition to the general requirements of Section I.2, the temperature shall be measured at a depth of 5 feet in waters 10 feet or greater in depth; and for those waters less than 10 feet in depth, temperature criteria will be applied at mid-depth.

10. Toxic Substances:

A. Aquatic Life and Human Health Standards

(1) Aquatic Life - The concentration of toxic substances shall not result in chronic or acute toxicity or impairment of the uses of aquatic life. Any levels in excess of these values will be considered to result in chronic or acute toxicity, or the impairment of the uses of aquatic life. Regardless of direct measurements of chronic or acute toxicity, the concentrations of toxic substances shall not exceed the chronic or acute values, except as provided for in Sections 10.F(1) and 10.F(2).

(2) Human Health - The concentration of toxic substances shall not exceed the level necessary to protect human health through exposure routes of fish (and shellfish) tissue consumption, water consumption, or other routes identified as appropriate for the water body.

B. Numeric criteria for all waters are established herein for certain toxic pollutants for which the Environmental Protection Agency (EPA) has published national criteria for the protection of aquatic life and human health pursuant to Section 304(a) of the Federal Clean Water Act in addition to chlorine and ammonia. The pollutants are listed in Table 1 and are expressed as the dissolved phase of the parameter.

C. Ammonia toxicity shall be evaluated according to EPA guidelines published in *1999 Update of Ambient Water Quality Criteria for Ammonia*; EPA document number EPA-822-R-99-014 or *Ambient Water Quality Criteria for Ammonia (Saltwater) - 1989*; EPA document number 440/5-88-004. This material related to ammonia toxicity is hereby incorporated by reference including any subsequent amendments and editions.

D. Definitions: When applying acute or chronic toxicity or human health criteria, the following definitions shall apply:

(1) 7Q10 is the 7-day average low stream flow with a 10-year occurrence period.

(2) Mean Annual Flow is the total of daily mean flows for the full period of record divided by the total days for the period of record.

E. Application of Numerical Criteria:

(1) When evaluating human health effects all waters must comply with the Organisms Only criteria except for waters classified as Public Water Supply and all stream segments within 50 stream miles upstream of a drinking water intake. Stream segments that are classified as Public Water Supply or are within 50 miles upstream of a drinking water intake shall comply with the Water and Organisms criteria.

(2) When applying toxicity or human health criteria the following stream flows shall be used:

Acute Toxicity - 7Q10
Chronic Toxicity - 7Q10
Human Health - Mean Annual Flow

(3) Criteria for certain metals may be modified on a site-specific basis when a water effect ratio (WER) is conducted in accordance with VI.C.2.a. of *Mississippi Wastewater Regulations for National Pollutant Discharge Elimination System (NPDES) Permits, Underground Injection Control (UIC) Permits, State Permits, Water Quality Based Effluent Limitations and Water Quality Certification*. In these instances, the criterion for the specific metal in the affected water body shall be equal to the criterion concentrations calculated using the following equations:

$$CMC = WER * Acute \text{ and } CCC = WER * Chronic$$

Where: CCC = Criteria Continuous Concentration
CMC = Criteria Maximum Concentration
WER = Water Effects Ratio for a Specific Pollutant
Acute = Acute Criterion from Table 1
Chronic = Chronic Criterion from Table 1

When a WER has not been conducted, the criterion listed in Table 1 of this regulation shall apply because the value of the WER is presumed to equal one in the absence of data to indicate otherwise.

F. Discharge Specific Criteria:

(1) Existing Discharges

(a) The Commission may establish discharger specific alternative criteria for existing discharges if all of the following conditions are satisfied:

(i) Discharge existed prior to December 1, 1988.

(ii) Discharger performs acute and/or chronic bioassays and instream biological assessments and other evaluations as deemed appropriate by the Commission.

(iii) The designated use of the waters is maintained.

(b) All discharger specific alternative criteria will be subject to Mississippi public participation requirements for revisions to water quality standards and will be subject to review by the U. S. Environmental Protection Agency.

(2) New Source Discharges

(a) The Commission may establish discharger specific criteria for new source discharges if the discharger can demonstrate that established Water Quality Criteria are based on conditions not applicable to Mississippi such as, but not limited to, the use of species not indigenous to Mississippi.

(b) All discharger specific alternative criteria will be subject to Mississippi public participation requirements for revisions to water quality standards and will be subject to review by the U. S. Environmental Protection Agency.

G. Toxic and Human Health Parameters for which no Numeric Criteria have been Established:

(1) For those toxic and human health parameters for which no numeric criteria have been established, the Commission shall determine limitations using available references which shall include, but not be limited to, *Quality Criteria for Water* (Section 304(a)), Federal regulations under Section 307 of the Clean Water Act, and Federal regulations under Section 1412 of the Public Health Service Act as amended by the Safe Drinking Act (Pub. 93-523).

(2) Definitions:

(a) The not to be exceeded value for criteria published in 1980 or the one-hour average value for criteria published in 1985 or later shall be used as an acute toxicity number for calculating effluent limitations, establishing Total Maximum Daily Loads (TMDLs), or reviewing ambient water quality data.

(b) The 24-hour average for criteria published in 1980 or the 4-day average for criteria published in 1985 or later shall be used as a chronic toxicity number for calculating effluent limitations, establishing TMDLs, or reviewing ambient water quality data.

(c) If metals concentrations for criteria are hardness-dependent, the chronic and acute concentrations shall be based on 25 mg/l hardness if the ambient hardness is less than or equal to 25 mg/l. Concentrations shall be based on the actual mixed stream hardness.

(d) If separate criteria are given for fresh and salt waters, they shall be applied as appropriate.

(e) For non-carcinogens, these concentrations will be determined using a Reference Dose (RfD) as published by the U. S. Environmental Protection Agency pursuant to Section 304(a) of the Federal Water Pollution Act as amended unless a more recent RfD is issued by the U. S. Environmental Protection Agency as listed in the Integrated Risk Information System (IRIS) file, in which case the more recent value will be used. Water quality standards or criteria used to calculate water quality-based effluent limitations (and for all other purposes of water quality criteria under Section 303(c) of the Clean Water Act) to protect human health through the different exposure routes are determined as follows:

(i) Fish tissue consumption:

$$WQC = (RfD) \times Body\ Weight / (FCR \times BCF)$$

where: WQC = water quality criterion
RfD = reference dose
FCR = fish consumption rate (6.5 gm/person-day)
BCF = bioconcentration factor

BCF values are based on U. S. Environmental Protection Agency publications pursuant to Section 304(a) of the Clean Water Act. FCR values are average consumption rates for a 70 kg adult for a lifetime of the population; alternative FCR values may be used when it is considered necessary to protect localized populations which may be consuming fish at a higher rate.

(ii) Water consumption and fish tissue consumption:

$$WQC = (RfD) \times Body\ Weight / (WCR + (FCR \times BCF))$$

where: WQC = water quality criterion
RfD = reference dose
FCR = fish consumption rate (6.5 gm/person-day)
BCF = bioconcentration factor
WCR = water consumption rate (assumed to be 2 liters/day for adults)

The equations listed in this subparagraph will be used to develop water criteria or standards on a case-by-case basis for toxic substances that are not presently included in the water quality standards. Alternative FCR values may be used when it is considered necessary to protect localized populations that may be consuming fish at a higher rate.

(f) For carcinogens, the concentrations of toxic substances will not result in unacceptable health risk and will be based on a Carcinogenic Potency Factor (CPF). An unacceptable health risk for cancer will be considered to be more than one additional case of cancer per one million people exposed (10^{-6} risk level). The CPF is a measure of the cancer-causing potency of a substance estimated by the upper 95 percent confidence limit of the slope of a straight line calculated by the Linearized Multistage Model according to the U.S. Environmental Protection Agency Guidelines (FR 51(185): 33992-34003, and FR 45(231 Part V): 79318-79379). Water quality standards or criteria used to calculate water quality-based effluent limitations (and for all other purposes of water quality criteria under Section 303(c) of the Clean Water Act) to protect human health through the different exposure routes are determined as follows:

(i) Fish tissue consumption:

$$WQC = (Risk) \times Body\ Weight / (CPF \times (FCR \times BCF))$$

where: WQC = water quality criterion
Risk = risk factor (10^{-6})
CPF = cancer potency factor
FCR = fish consumption rate (6.5 gm/person-day)
BCF = bioconcentration factor

BCF values are based on U.S. Environmental Protection Agency publications pursuant to Section 304(a) of the Clean Water Act. FCR values are average consumption rates for a 70 kg adult for a lifetime of the population; alternative FCR values may be used when it is considered necessary to protect localized populations which may be consuming fish at a higher rate.

(ii) Water consumption (including a correction for fish consumption):

$$WQC = Risk \times Body\ Weight / (CPF \times (WCR + (FCR \times BCF)))$$

where: WQC = water quality criterion
Risk = risk factor (10^{-6})
CPF = cancer potency factor
FCR = fish consumption rate (6.5 gm/person-day)
BCF = bioconcentration factor
WCR = water consumption rate (assumed to be 2 liters/day for adults)

The equations listed in this subparagraph will be used to develop water criteria or standards on a case-by-case basis for toxic substances that are not presently included in the water quality standards. Alternative FCR values may be used when it is considered necessary to protect localized populations that may be consuming fish at a higher rate.

TABLE 1 Notes

a The CMC = $1/[(f_1/CMC_1) + (f_2/CMC_2)]$ where f_1 and f_2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC_1 and CMC_2 are 185.9 µg/l and 12.83 µg/l. The value in the table is calculated assuming a worst case scenario in which all selenium is present as selenate.

b Hardness dependent parameter. Criteria are indicated at hardness of 50 mg/l as $CaCO_3$. Equations for criteria calculation of hardness dependent parameters can be found in *Quality Criteria for Water*. The equation is applicable for instream hardness ranges from 25 mg/l to 400 mg/l. If instream hardness is less than 25 mg/l, then a hardness value of 25 mg/l should be used to calculate the criteria. If instream hardness is greater than 400 mg/l, then a hardness of 400 mg/l should be used to calculate the criteria.

c Criteria for pentachlorophenol are based on a pH dependent equation as found in *Quality Criteria for Water*. Values listed are for a pH of 7.0 s.u.

d Criteria for 2,3,7,8 TCDD based on a risk factor of one in one hundred thousand (10^{-5}).

e Site specific criteria for Mississippi Sound.

f Parameter subject to water effects ratio equations where:
CMC = WER * Acute
CCC = WER * Chronic

g Ammonia criteria are dependent on pH, temperature, and/or salinity. See Section II.10.C.

h Expressed as µg free cyanide (as CN)/L.

i Refers to the inorganic form only.

j Applies to the sum of α and β isomers.

k Applies to individual isomers of Endosulfan including α, β, and Endosulfan Sulfate.

m Chemical Abstracts Service (CAS) registry numbers, which provide a unique identification for each chemical.

TABLE 1
Numeric Criteria for All Waters (µg/l)

CAS [m]	Parameter	Fresh Water		Salt Water		Human Health	
		Acute	Chronic	Acute	Chronic	Organisms Only	Water & Organisms
309002	Aldrin	3.0		1.3		0.00014	0.00013
7664417	Ammonia	[g]	[g]	[g]	[g]		
7440382	Arsenic (III), Total Dissolved	340 [f]	150 [f]	69	36		
7440382	Arsenic, Total Dissolved					24 [l]	0.078 [l]
7440439	Cadmium, Total Dissolved	1.03 [b,f]	0.15 [b,f]	40	8.8	168	5
57749	Chlordane	2.4	0.0043	0.09	0.004	0.0022	0.0021
7782505	Chlorine	19	11	13	7.5		
18540299	Chromium (Hex), Total Dissolved	16 [f]	11 [f]	1100	50	1470	98
16065831	Chromium (III), Total Dissolved	323 [b,f]	42 [b,f]			140468	100
7440508	Copper, Total Dissolved	7.0 [b,f]	5.0 [b,f]	4.8	3.1	1000	1000
57125	Cyanide	22.0 [h]	5.2 [h]	1.0 [h]	1.0 [h]	220000	200
50293	4,4 DDT	1.1	0.001	0.13	0.001	0.00059	0.00059
60571	Dieldrin	0.24	0.056	0.71	0.0019	0.000144	0.000135
1746016	2,3,7,8 TCDD (Dioxin)					1.0 ppq [d]	1.0 ppq [d]
959988	alpha-Endolsulfan	0.22 [J]	0.056 [J]	0.034 [J]	0.0087 [J]	240 [k]	110 [k]
33213659	beta-Endosulfan	0.22 [J]	0.056 [J]	0.034 [J]	0.0087 [J]	240 [k]	110 [k]
1031078	Endosulfan Sulfate	0.22 [J]	0.056 [J]	0.034 [J]	0.0087 [J]	240 [k]	110 [k]
72208	Endrin	0.086	0.036	0.037	0.0023	0.814	0.76
76448	Heptachlor	0.52	0.0038	0.053	0.0036	0.000214	0.000208

58899	gamma-BHC (Lindane)	0.95	0.08	0.16		0.0625	0.0186
7439921	Lead, Total Dissolved	30 [b,f]	1.18 [b,f]	210	8.1		15
7439976	Mercury (II), Total Dissolved	2.1 [f]	0.012	1.8	0.025		
7439976	Mercury					0.153	0.151
7440020	Nickel, Total Dissolved	260 [b,f]	29 [b,f]	75	8.3	4584	607
				167 [e]	18.5 [e]		
108952	Phenol	300	102	300	58	300	300
87865	Pentachlorophenol	8.7 [c]	6.7 [c]	13 [c]	7.9 [c]	8.2	0.28
	PCB 1242	0.2	0.014	1.0	0.03		
	PCB 1254	0.2	0.014	1.0	0.03		
	PCB 1221	0.2	0.014	1.0	0.03		
	PCB 1232	0.2	0.014	1.0	0.03		
	PCB 1248	0.2	0.014	1.0	0.03		
	PCB 1260	0.2	0.014	1.0	0.03		
	PCB 1016	0.2	0.014	1.0	0.03		
	Total PCB					0.00035	0.00035
7782492	Selenium, Total Dissolved	11.8 [a,f]	4.6 [f]	290 [f]	71 [f]	3365	50
7440224	Silver, Total Dissolved	0.98 [b,f]		1.9			100
8001352	Toxaphene	0.73	0.0002	0.21	0.0002	0.00075	0.00073
7440666	Zinc, Total Dissolved	65 [b,f]	65 [b,f]	90	81	5000	5000

SECTION III. SPECIFIC WATER QUALITY CRITERIA:

1. PUBLIC WATER SUPPLY:

Water in this classification is for use as a source of raw water supply for drinking and food processing purposes. The water treatment process shall be approved by the Mississippi State Department of Health. The raw water supply shall be such that after the approved treatment process, it will satisfy the regulations established pursuant to Section 1412 of the Public Health Service Act as amended by the Safe Drinking Water Act (Pub. L. 93-523). Waters that meet the Public Water Supply criteria shall also be suitable for secondary contact recreation. Secondary contact recreation is defined as incidental contact with the water during activities such as wading, fishing, and boating, that are not likely to result in full body immersion. In considering the acceptability of a proposed site for disposal of bacteria latent wastewater in or near waters with the public water supply classification, the Permit Board shall consider the relative proximity of the discharge to water supply intakes.

A. Bacteria: For the months of May through October, when water contact recreation activities may be expected to occur, fecal coliform shall not exceed a geometric mean of 200 per 100 ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than 10% of the time.

   For the months of November through April, when incidental recreational contact is not likely, fecal coliform shall not exceed 2000 per 100 ml as a geometric mean (either MPN or MF count) based on at least 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 4000 per 100 ml more than 10% of the time.

B. Chlorides (Cl): There shall be no substances added which will cause the chloride content to exceed 230 mg/l in freshwater streams.

C. Specific Conductance: There shall be no substances added to increase the conductivity above 500 micromhos/cm for freshwater streams.

D. Dissolved Solids: There shall be no substances added to the waters that will cause the dissolved solids to exceed 500 mg/l for freshwater streams.

E. Threshold Odor: There shall be no substances added which will cause the threshold odor number to exceed 24 (at 60°C) as a daily average.

F. Radioactive Substances: There shall be no radioactive substances added to the waters which will cause the gross beta activity (in the known absence of Strontium-90 and alpha emitters) to exceed 1000 picocuries per liter at any time.

G. Specific Chemical Constituents: In addition to the provisions in Section II.4. and 10., the following concentrations (dissolved) shall not be exceeded at any time:

Constituent	Concentration (mg/l)
Barium	2.0
Fluoride	2.0
Lead	0.015
Nitrate (as N)	10.0

2. SHELLFISH HARVESTING

Waters classified for this use are for propagation and harvesting shellfish for sale or use as a food product. These waters shall meet the requirements set forth in the latest edition of the *National Shellfish Sanitation Program, Manual of Operations, Part I, Sanitation of Shellfish Growing Areas*, as published by the U. S. Public Health Service. Waters that meet the Shellfish Harvesting Area Criteria shall also be suitable for recreational purposes. In considering the acceptability of a proposed site for disposal of bacteria latent wastewater in or near waters with this classification, the Permit Board shall consider the relative proximity of the discharge to shellfish harvesting beds.

A. Bacteria: The median fecal coliform MPN (Most Probable Number) of the water shall not exceed 14 per 100 ml, and not more than 10% of the samples shall ordinarily exceed an MPN of 43 per 100 ml in those portions or areas most probably exposed to fecal contamination during most unfavorable hydrographic and pollutive conditions.

3. RECREATION:

Waters in this classification are to be suitable for recreational purposes, including such water contact activities as swimming and water skiing. In considering the acceptability of a proposed site for disposal of bacteria latent wastewater in or near waters with this classification, the Permit Board shall consider the relative proximity of the discharge to areas of actual water contact activity.

A. Bacteria: Fecal coliform shall not exceed a geometric mean of 200 per 100 ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than 10% of the time. For both marine and estuarine coastal recreational waters, Enterococci shall not exceed a seasonal (May – October and November – April) geometric mean of 35 per 100 ml based on a minimum of 20 samples collected during each season. Coastal recreational waters do not include inland waters upstream of the mouth of a river or a stream having a natural connection to the open sea.

B. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micromhos/cm for freshwater streams.

C. Dissolved Solids: There shall be no substances added to the water to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 1500 mg/l at any time for freshwater streams.

4. FISH AND WILDLIFE:

Waters in this classification are intended for fishing and for propagation of fish, aquatic life, and wildlife. Waters that meet the Fish and Wildlife Criteria shall also be suitable for secondary contact recreation. Secondary contact recreation is defined as incidental contact with the water during activities such as wading, fishing, and boating, that are not likely to result in full body immersion.

A. Bacteria: For the months of May through October, when water contact recreation activities may be expected to occur, fecal coliform shall not exceed a geometric mean of 200 per 100 ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than 10% of the time.

For the months of November through April, when incidental recreational contact is not likely, fecal coliform shall not exceed a geometric mean of 2000 per100 ml based on a minimum of 5 samples taken over a 30-day period with no less than-12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 4000 per 100 ml more than 10% of the time.

B. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micromhos/cm for freshwater streams.

C. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 1500 mg/l at any time for freshwater streams.

5. EPHEMERAL STREAM:

Waters in this classification do not support a fisheries resource and are not usable for human consumption or aquatic life. Ephemeral streams normally are natural watercourses, including natural watercourses that have been modified by channelization or manmade drainage ditches, that without the influent of point source discharges, flow only in direct response to precipitation or irrigation return-water discharge in the immediate vicinity and whose channels are normally above the groundwater table. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment

of aquatic life protection uses. These streams may contain a transient population of aquatic life during the portion of the year when there is suitable habitat for fish survival. Normally, aquatic habitat in these streams is not adequate to support a reproductive cycle for fish and other aquatic life. Wetlands are excluded from this classification.

Waters in this classification shall be protective of wildlife and humans that may come in contact with the waters. Waters contained in ephemeral streams shall also allow maintenance of the standards applicable to all downstream waters.

A. Provisions 1, 2, 3, and 5 of Section II (Minimum Conditions Applicable to All Waters) are applicable except as they relate to fish and other aquatic life. All aspects of provisions 4 and 10 of Section II concerning toxicity will apply to ephemeral streams, except for domestic or compatible domestic wastewater discharges which will be required to meet toxicity requirements in downstream waters not classified as ephemeral. Alternative methods may be utilized to determine the potential toxic effect of ammonia. Acutely toxic conditions are prohibited under any circumstances in waters in this classification.

B. Dissolved Oxygen: The dissolved oxygen shall be maintained at an appropriate level to avoid nuisance conditions.

C. Bacteria: The Permit Board may assign bacterial criteria where the probability of a public health hazard or other circumstances so warrant.

D. Definitions:

(1) Fisheries resource is defined as any water body which has a viable gamefish population as documented by the Mississippi Department of Wildlife Fisheries and Parks or has sufficient flow or physical characteristics to support the fishing use during times other than periods of flow after precipitation events or irrigation return water discharge.

(2) "Not usable for human consumption or aquatic life" means that sufficient flow or physical characteristics are not available to support these uses.

(3) "Flow only in response to precipitation or irrigation return water" means that without the influence of point source discharges the stream will be dry unless there has been recent rainfall or a discharge of irrigation return water.

(4) "Protective of wildlife and humans that may come in contact with the waters" means that toxic pollutants shall not be discharged in concentrations that will endanger wildlife or humans.

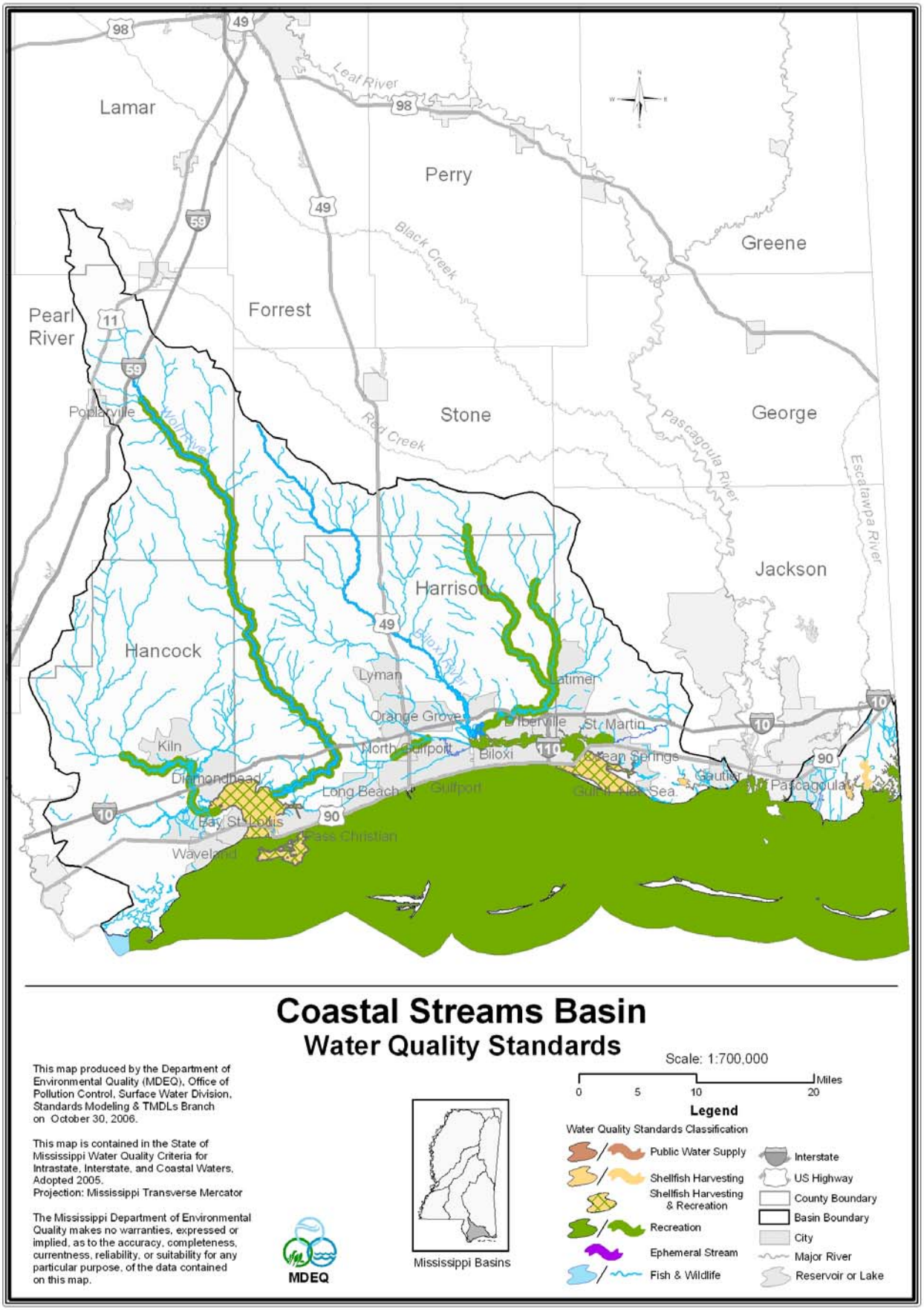
(5) "Nuisance conditions" means objectionable odors or aesthetic conditions that may generate complaints from the public.

Recommendations for assignment of the Ephemeral Stream classification shall be made to the Commission on Environmental Quality by the Permit Board after appropriate demonstration of physical and hydrological data. The Ephemeral Stream classification shall not be assigned where environmental circumstances are such that a nuisance or hazardous condition would result or public health is likely to be threatened. Alternate discharge points shall be investigated before the Ephemeral Stream classification is considered.

SECTION IV. DESIGNATED USES IN STATE WATERS:

All of the State waters not specifically listed below shall be classified as Fish and Wildlife. State waters carrying other classifications are:

Coastal Streams Basin		
Waters	**Location**	**Classification**
Back Bay of Biloxi	From Popps Ferry Bridge to Biloxi Bay	Recreation
Bangs Lake	From headwaters to the Mississippi Sound	Shellfish Harvesting
Bayou Cumbest	From headwaters to the Mississippi Sound	Shellfish Harvesting
Big Lake	From Bernard Bayou to the Popps Ferry Bridge	Recreation
Biloxi Bay	From Headwaters (US Hwy 90 Bridge) to the Mississippi Sound	Shellfish Harvesting Recreation
Davis Bayou	From headwaters to the Biloxi Bay	Shellfish Harvesting
Graveline Bay	From headwaters to Graveline Bayou	Shellfish Harvesting
Graveline Bayou	From Graveline Bay to the Mississippi Sound	Shellfish Harvesting
Jourdan River	From confluence of Bacon Bayou and Catahoula Creek to the St. Louis Bay	Recreation
Mallini Bayou	From St. Louis Bay to St. Louis Bay	Shellfish Harvesting
Mississippi Sound	Contiguous to Mississippi Coastline	Recreation
Old Fort Bayou	From Bayou Talla to Biloxi Bay	Recreation
Pass Christian Reef (off Henderson Point)	Mississippi Sound	Shellfish Harvesting Recreation
St. Louis Bay	Harrison and Hancock Counties	Shellfish Harvesting Recreation
Tchoutacabouffa River	From headwaters to the Back Bay of Biloxi	Recreation
Turkey Creek	From Forest Heights Middle School to Bernard Bayou	Recreation
Tuxachanie Creek	From headwaters to the Tchoutacabouffa River	Recreation
Wolf River	From MS Hwy 26 to the St. Louis Bay	Recreation



Coastal Streams Basin

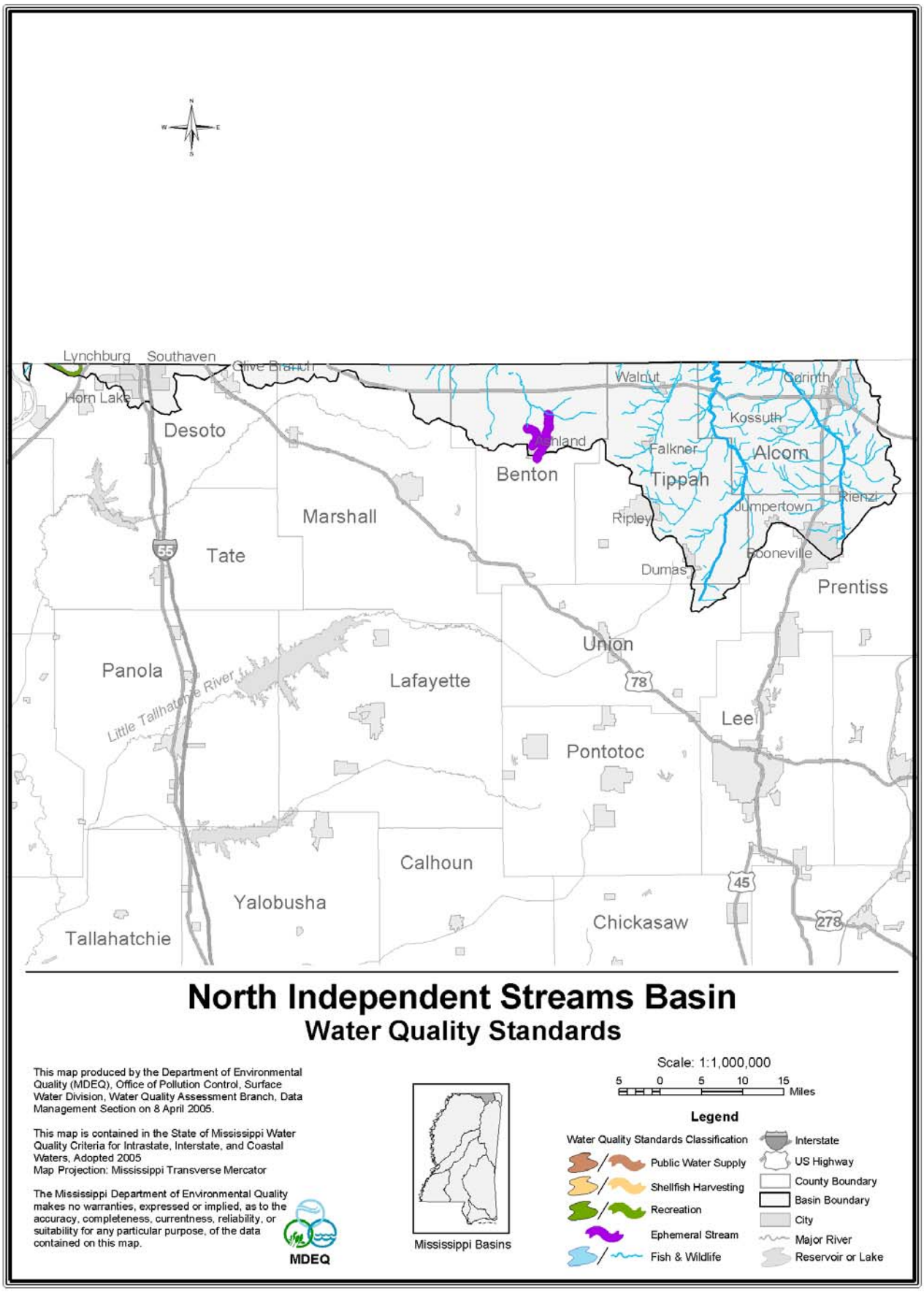
Water Quality Standards

This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Standards Modeling & TMDLs Branch on October 30, 2006.

This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005.
Projection: Mississippi Transverse Mercator

The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.

North Independent Streams Basin		
Waters	**Location**	**Classification**
Bowden Sand Ditch (East Lagoon)	From Ashland to Tubby Creek	Ephemeral
Drennan Sand Ditch (NW Lagoon)	From Ashland to Robinson Bottom	Ephemeral
Horn Lake	DeSoto County	Recreation
Tubby Creek	From River Mile 5.2 to River Mile 2.8	Ephemeral



North Independent Streams Basin

Water Quality Standards

This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Water Quality Assessment Branch, Data Management Section on 8 April 2005.

This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005
Map Projection: Mississippi Transverse Mercator

The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.

MDEQ

Mississippi Basins

Scale: 1:1,000,000

5 0 5 10 15 Miles

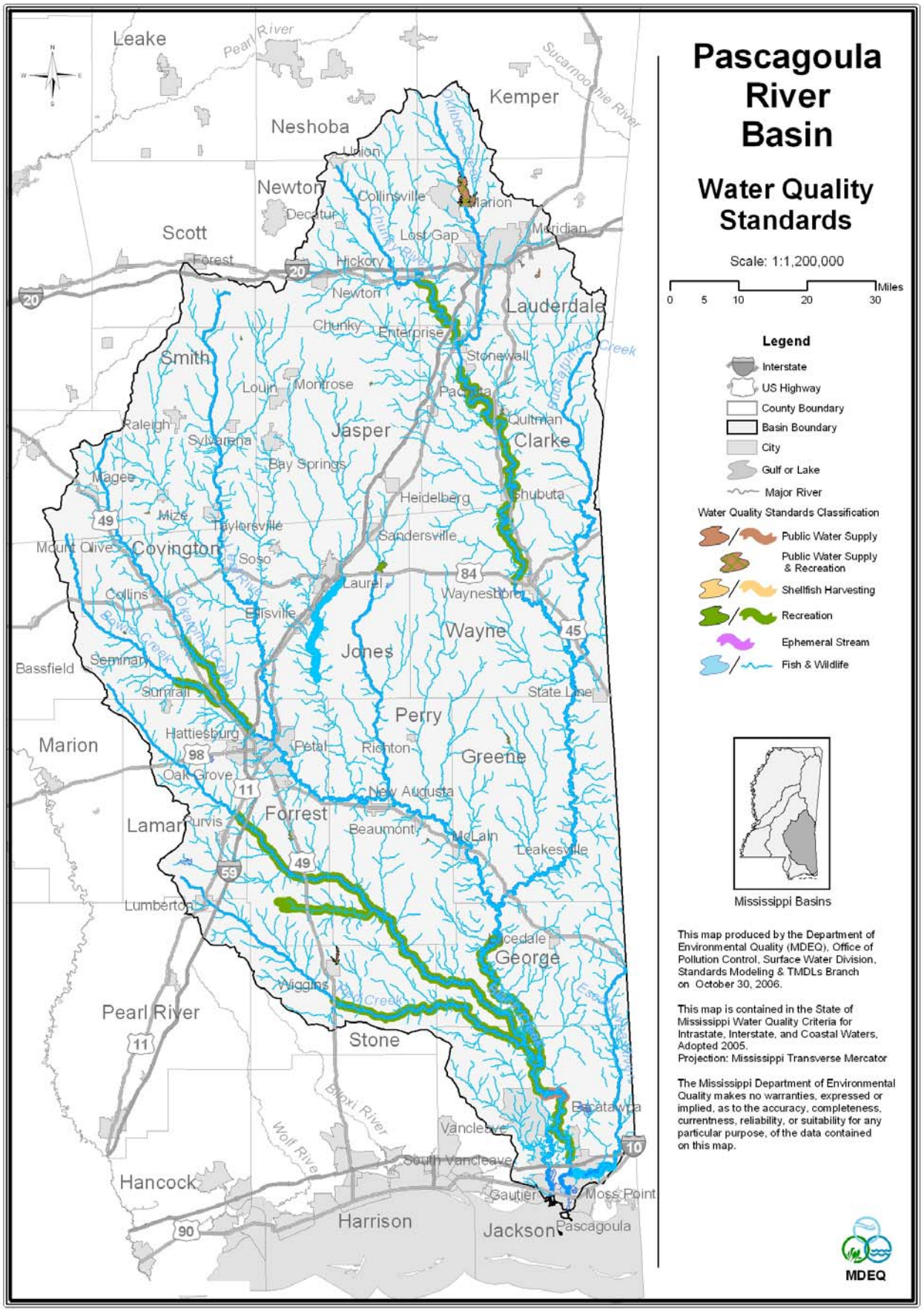
Legend

Water Quality Standards Classification
- Public Water Supply
- Shellfish Harvesting
- Recreation
- Ephemeral Stream
- Fish & Wildlife

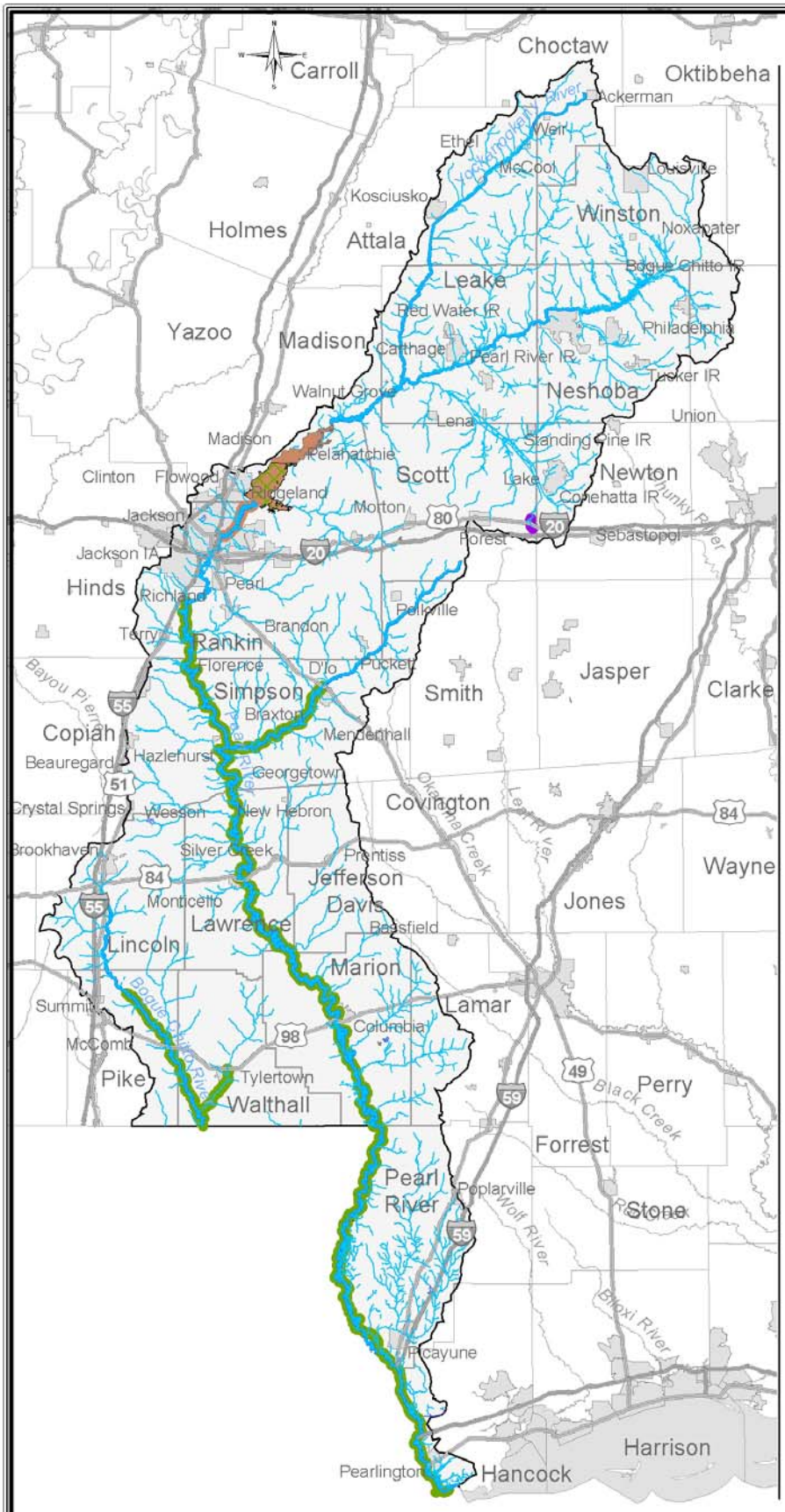
- Interstate
- US Highway
- County Boundary
- Basin Boundary
- City
- Major River
- Reservoir or Lake

Pascagoula River Basin		
Waters	**Location**	**Classification**
Archusa Reservoir	Clarke County	Recreation
Beaverdam Creek	From headwaters in Perry and Forrest Counties to Black Creek	Recreation
Black Creek	From Hwy 11 to the Pascagoula River	Recreation
Bonita Reservoir	Lauderdale County	Public Water Supply
Bowie Creek	From MS Hwy 589 to the Bowie River	Recreation
Bowie River	From Bowie Creek to Interstate 59	Recreation
Chickasawhay River	From Stonewall to MS Hwy 84	Recreation
Chunky River	From US Hwy 80 to the Chickasawhay River	Recreation
Clarke State Park (Ivy Lake)	Clarke County	Recreation
Dry Creek Lake Site #3	Covington County	Recreation
Escatawpa River	From River Mile 10 to the Pascagoula River	Fish and Wildlife[1,2]
Flint Creek Reservoir	Stone County	Public Water Supply Recreation
Lake Bogue Homa	Jones County	Recreation
Lake Claude Bennett	Jasper County	Recreation
Lake Geiger	Forrest County	Recreation
Lake Marathon	Smith County	Recreation
Lake Mike Conner	Covington County	Recreation
Lake Perry	Perry County	Recreation
Lake Ross Barnett	Smith County	Recreation
Lake Shongela	Smith County	Recreation
Lakeland Park Lake	Wayne County	Recreation
Long Creek Reservoir	Lauderdale County	Public Water Supply
Okatibbee Reservoir	Lauderdale County	Public Water Supply Recreation
Okatoma Creek	From Seminary (MS Hwy 590) to the Bowie River	Recreation
Pascagoula River	From 5 miles north of Cumbest Bluff to Cumbest Bluff	Public Water Supply
Pascagoula River	From 6 miles north of MS Hwy 26 (George County) to Smear Bayou (Jackson County)	Recreation
Red Creek	From US Hwy 49 to Big Black Creek	Recreation
Turkey Creek Reservoir	Greene County	Recreation

1. The following dissolved oxygen standard is applicable: The dissolved oxygen shall not be less than 3.0 mg/l.
2. Remains under EPA review as of July 26, 2007.


Pascagoula River Basin
Water Quality Standards
Scale: 1:1,200,000
Miles
0 5 10 20 30
Legend
Interstate
US Highway
County Boundary
Basin Boundary
City
Gulf or Lake
Major River
Water Quality Standards Classification
Public Water Supply
Public Water Supply & Recreation
Shellfish Harvesting
Recreation
Ephemeral Stream
Fish & Wildlife
Mississippi Basins
This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Standards Modeling & TMDLs Branch on October 30, 2006.
This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005.
Projection: Mississippi Transverse Mercator
The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.
MDEQ
Leake
Pearl River
Kemper
Neshoba
Newton
Scott
Smith
Jasper
Clarke
Lauderdale
Covington
Jones
Wayne
Perry
Greene
Marion
Lamar
Forrest
Pearl River
Stone
George
Hancock
Harrison
Jackson
Pascagoula

Pearl River Basin		
Waters	**Location**	**Classification**
Barnett Reservoir	From River Bend to township line between T7N and T8N	Public Water Supply
Barnett Reservoir	From township line between T7N and T8N to the Reservoir Dam	Public Water Supply Recreation
Bogue Chitto River	From MS Hwy 570 to the MS/LA State Line	Recreation
Lake Columbia	Marion County	Recreation
Lake Dixie Springs	Pike County	Recreation
Magees Creek	From US Hwy 98 to the Bogue Chitto River	Recreation
Pearl River	From Barnett Reservoir to the City of Jackson Water Intake	Public Water Supply
Pearl River	From Byram Bridge to the Mississippi Sound	Recreation
Strong River	From US Hwy 49 to the Pearl River	Recreation
Shadow Lake (Roosevelt State Park)	Scott County	Recreation
Legion Lake	Simpson County	Recreation
Warrior Branch	From lake to Warrior Creek	Ephemeral



Pearl River Basin

Water Quality Standards

Scale: 1:1,500,000

5 0 5 10 15 Miles

Legend

- Interstate
- US Highway
- County Boundary
- Basin Boundary
- City
- Gulf or Reservoir
- Major River

Water Quality Standards Classification

- Public Water Supply
- Public Water Supply & Recreation
- Shellfish Harvesting
- Recreation
- Ephemeral Stream
- Fish & Wildlife

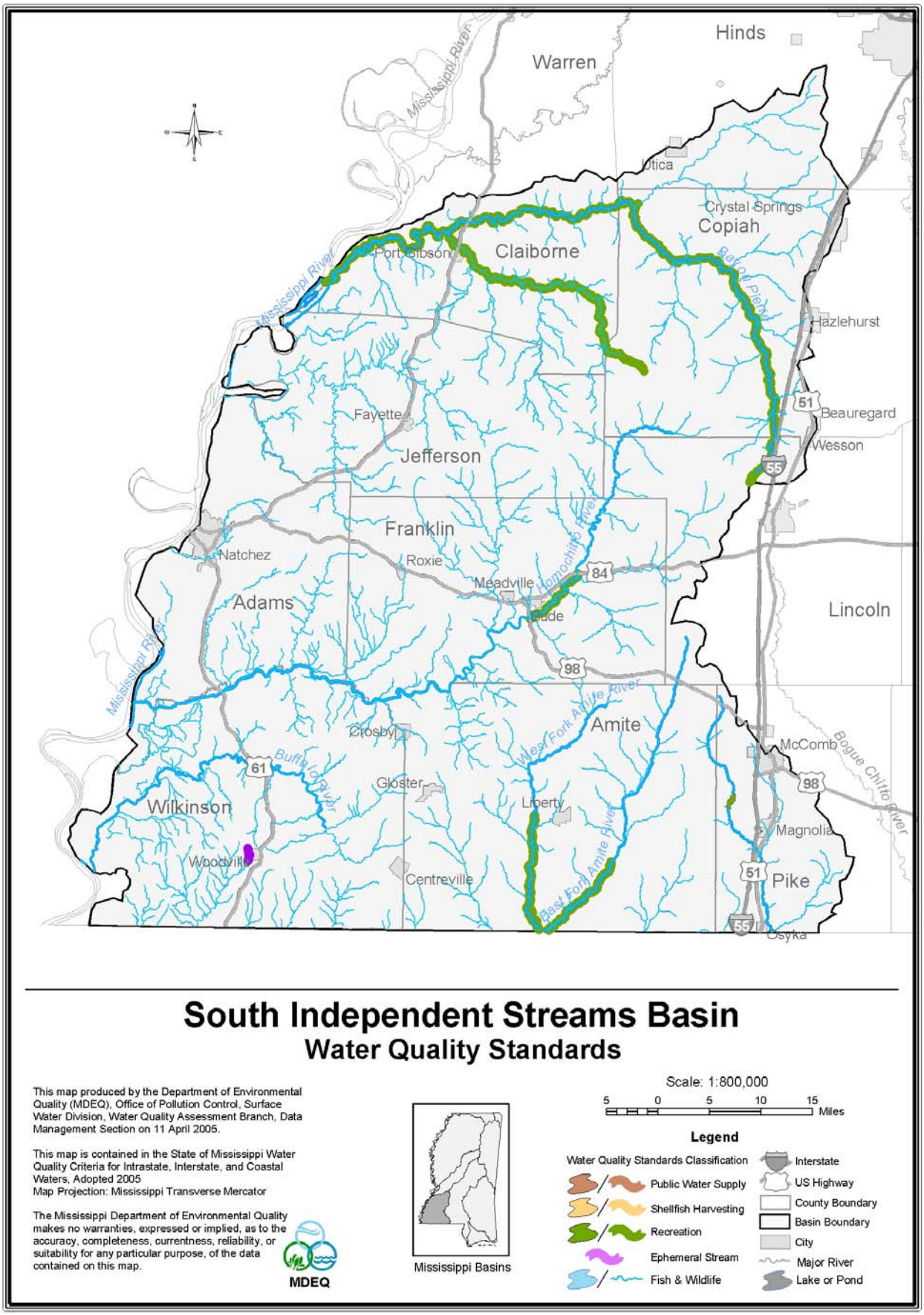
Mississippi Basins

This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Water Quality Assessment Branch, Data Management Section on 11 April 2005.

This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005.
Projection: Mississippi Transverse Mercator

MDEQ

South Independent Streams Basin		
Waters	**Location**	**Classification**
Bayou Pierre	From headwaters to the Mississippi River	Recreation
Clear Springs Lake	Franklin County	Recreation
East Fork Amite River	From MS Hwy 584 to the MS/LA State Line	Recreation
Homochitto River	From US Hwy 84 to US Hwy 98	Recreation
Little Bayou Pierre	From headwaters to Bayou Pierre	Recreation
Percy Quinn State Park Lake	Pike County	Recreation
Unnamed Drainage Ditch (Westside Heights)	From Woodville to Bayou Sara	Ephemeral
West Fork Amite River	From MS Hwy 24 to the MS/LA State Line	Recreation



South Independent Streams Basin

Water Quality Standards

This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Water Quality Assessment Branch, Data Management Section on 11 April 2005.

This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005
Map Projection: Mississippi Transverse Mercator

The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.

MDEQ

Mississippi Basins

Scale: 1:800,000

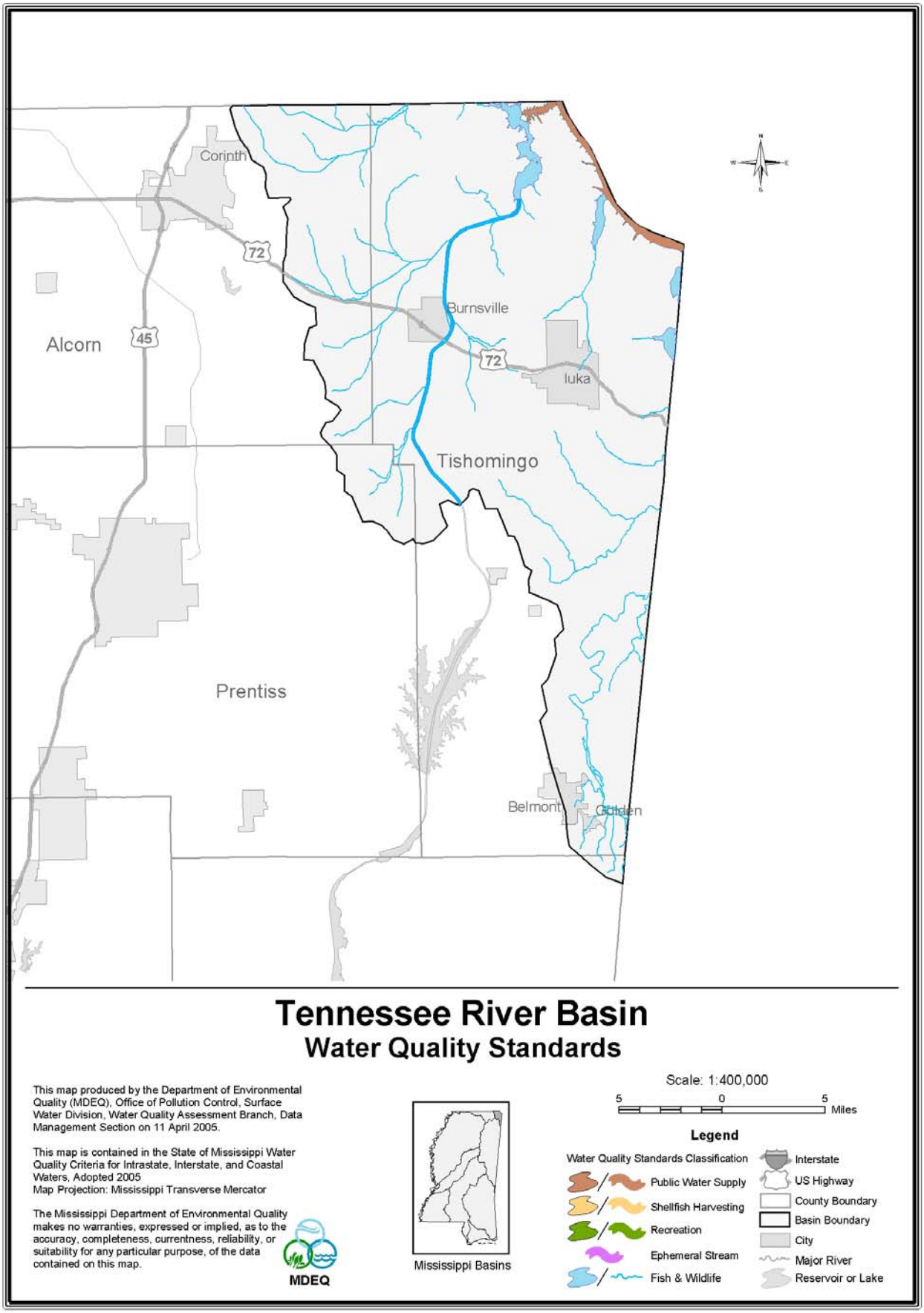
5 0 5 10 15 Miles

Legend

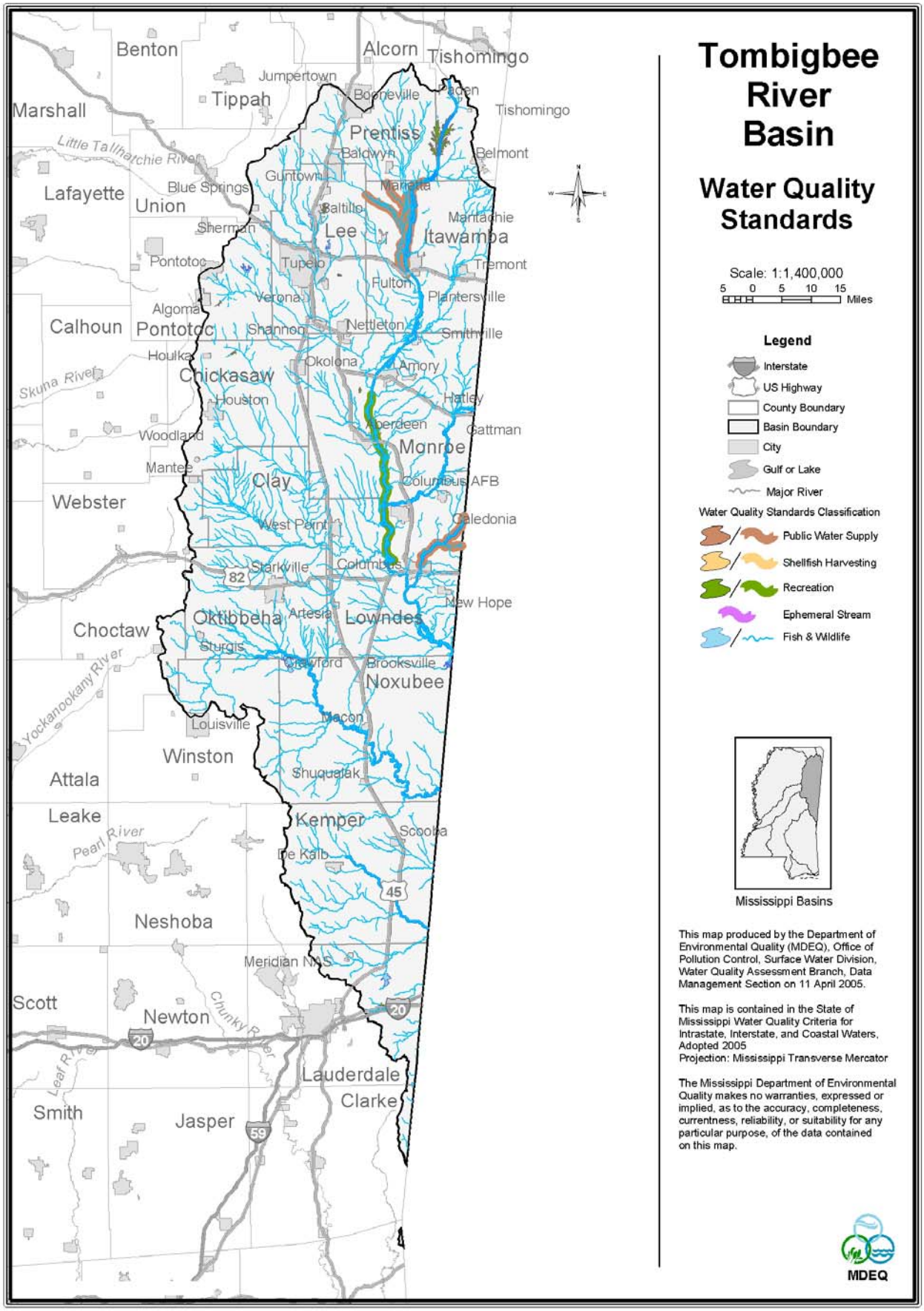
Water Quality Standards Classification
- Public Water Supply
- Shellfish Harvesting
- Recreation
- Ephemeral Stream
- Fish & Wildlife

- Interstate
- US Highway
- County Boundary
- Basin Boundary
- City
- Major River
- Lake or Pond

Tennessee River Basin		
Waters	**Location**	**Classification**
Tennessee River (Pickwick Lake)	From MS/AL State Line to the MS/TN State Line	Public Water Supply
Yellow Creek Embayment	Tishomingo County	Public Water Supply

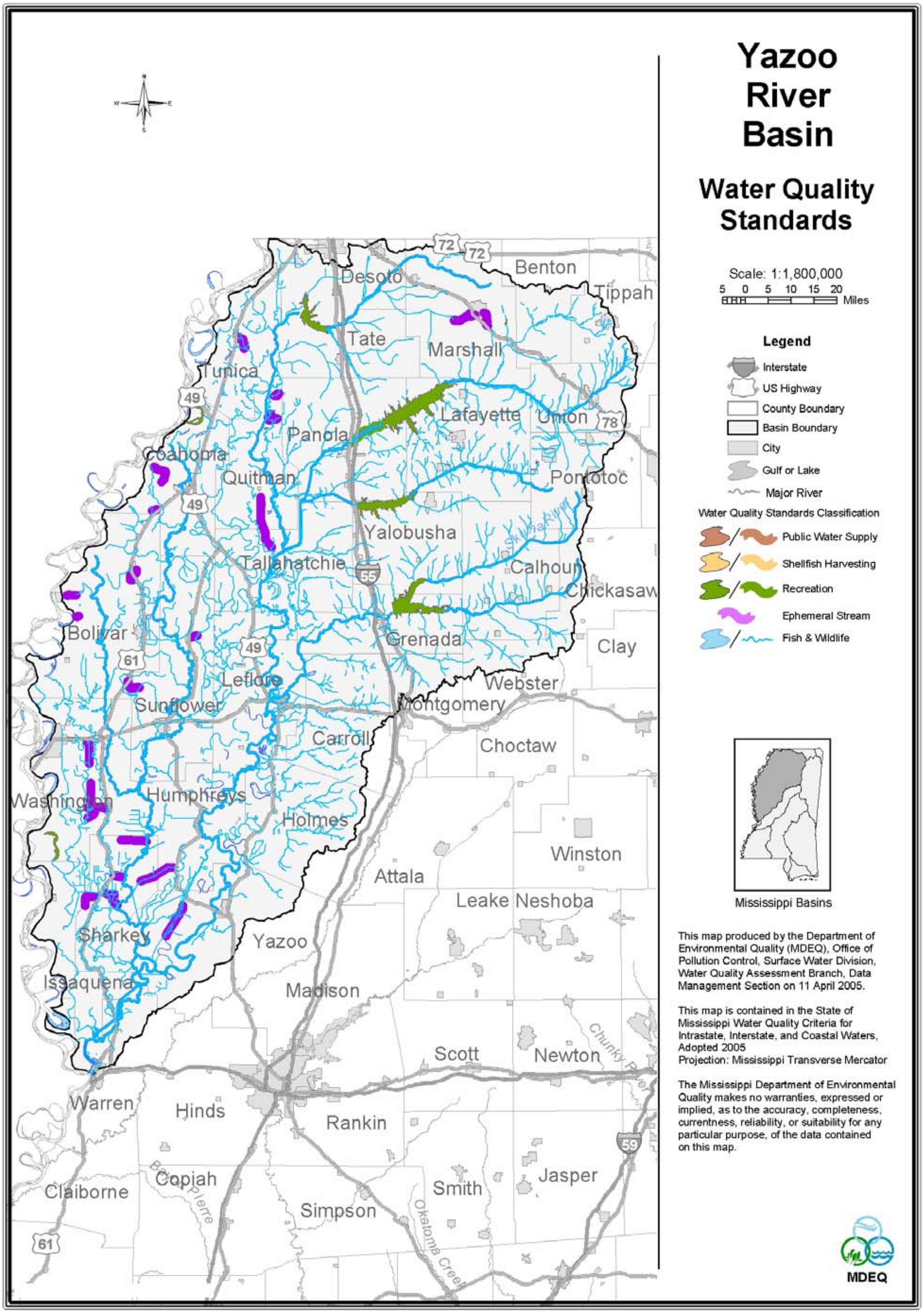

Corinth
72
Burnsville
Alcorn
45
72
Iuka
Tishomingo
Prentiss
Belmont
Golden
Tennessee River Basin
Water Quality Standards
This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Water Quality Assessment Branch, Data Management Section on 11 April 2005.
This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005
Map Projection: Mississippi Transverse Mercator
The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.
MDEQ
Mississippi Basins
Scale: 1:400,000
5 0 5 Miles
Legend
Water Quality Standards Classification
Public Water Supply
Shellfish Harvesting
Recreation
Ephemeral Stream
Fish & Wildlife
Interstate
US Highway
County Boundary
Basin Boundary
City
Major River
Reservoir or Lake

Tombigbee River Basin		
Waters	**Location**	**Classification**
Aberdeen Lake (Tenn-Tom Waterway)	From Mile 355.5 to Mile 364.3 (Normal Pool Elevation 190.0)	Recreation
Bay Springs Lake (Tenn-Tom Waterway)	From Mile 410.0 to Mile 419.0 (Normal Pool Elevation 414.0)	Recreation
Canal Section Pool "C" (Tenn-Tom Waterway)	From Mile 389.0 to Mile 396.4 (Normal Pool Elevation 270.0)	Recreation
Chiwapa Reservoir	Pontotoc County	Recreation
Choctaw Lake	Choctaw County	Recreation
Columbus Lake (Tenn-Tom Waterway)	From Mile 332.9 to Mile 355.5 (Normal Pool Elevation 163.0)	Recreation
Davis Lake	Chickasaw County	Recreation
Donivan Creek	From Natchez Trace Parkway to the Tombigbee River	Public Water Supply
Lake Lamar	Lee County	Recreation
Lake Lowndes	Lowndes County	Recreation
Lake Monroe	Monroe County	Recreation
Lake Tom Bailey	Lauderdale County	Recreation
Luxapallila Creek	From the MS/AL State Line to Hwy 50	Public Water Supply
Oktibbeha County Lake	Oktibbeha County	Recreation
Tenn-Tom Waterway		Public Water Supply
Twentymile Creek	From Natchez Trace Parkway to the Tombigbee River	Public Water Supply
Tombigbee River	From Boat Ramp Road to Hwy 78	Public Water Supply
Tombigbee State Park Reservoir	Lee County	Recreation
Yellow Creek	From the MS/AL State Line to Luxapallila Creek	Public Water Supply


Tombigbee River Basin
Water Quality Standards
Scale: 1:1,400,000
5 0 5 10 15
Miles
Legend
Interstate
US Highway
County Boundary
Basin Boundary
City
Gulf or Lake
Major River
Water Quality Standards Classification
Public Water Supply
Shellfish Harvesting
Recreation
Ephemeral Stream
Fish & Wildlife
Mississippi Basins
This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Water Quality Assessment Branch, Data Management Section on 11 April 2005.
This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005
Projection: Mississippi Transverse Mercator
The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.
MDEQ
Benton
Alcorn
Tishomingo
Jumpertown
Tippah
Booneville
Marshall
Prentiss
Baldwyn
Belmont
Little Tallahatchie River
Guntown
Blue Springs
Lafayette
Union
Baldillo
Sherman
Lee
Itawamba
Pontotoc
Tupelo
Fulton
Tremont
Verona
Plantersville
Algoma
Calhoun
Shannon
Nettleton
Smithville
Houlka
Okolona
Amory
Chickasaw
Skuna River
Houston
Hatley
Aberdeen
Cattman
Woodland
Monroe
Webster
Clay
Columbus AFB
Caledonia
West Point
Starkville
Columbus
82
New Hope
Choctaw
Oktibbeha
Artesia
Lowndes
Sturgis
Crawford
Brooksville
Noxubee
Yockanookany River
Louisville
Macon
Winston
Attala
Shuqualak
Leake
Kemper
Scooba
Pearl River
De Kalb
45
Neshoba
Meridian NAS
Scott
Newton
Chunky River
20
Leaf River
Lauderdale
Clarke
Smith
Jasper
59

Yazoo River Basin		
Waters	**Location**	**Classification**
Arkabutla Reservoir	DeSoto and Tate Counties	Recreation
Canal #12	From Delta City to the Big Sunflower River	Ephemeral
Chewalla Reservoir	Marshall County	Recreation
Drainage Ditch #3	From Rosedale to Lane Bayou	Ephemeral
Enid Reservoir	Panola, Lafayette, and Yalobusha Counties	Recreation
Grenada Reservoir	Grenada County	Recreation
Lake Dumas	Tippah County	Recreation
Lake Washington	Washington County	Recreation
Little Tallahatchie River	From Sardis Reservoir to US Hwy 51	Recreation
Moon Lake	Coahoma County	Recreation
Nunnally Creek	From Holly Springs (Lagoons A and #1) to Pigeon Roost Creek	Ephemeral
Sardis Reservoir	Panola and Lafayette Counties	Recreation
Straight Bayou Drainage Main Ditch "A"	From Louise to Dowling Bayou	Ephemeral
Tillatoba Lake	Yalobusha County	Recreation
Unnamed Drainage Canal	From Anguilla to the Big Sunflower River	Ephemeral
Unnamed Drainage Ditch	From Arcola to Black Bayou	Ephemeral
Unnamed Drainage Ditch	From Beulah to Leban Bayou	Ephemeral
Unnamed Drainage Ditch	From Bobo to Annis Brake	Ephemeral
Unnamed Drainage Ditch	From Crenshaw to David Bayou	Ephemeral
Unnamed Drainage Ditch (Hollandale)	From Farm Fresh Catfish to Black Bayou	Ephemeral
Unnamed Drainage Ditch	From Farrell to Overcup Slough	Ephemeral
Unnamed Drainage Ditch	From Holly Springs (Lagoon A) to Nunnally Creek	Ephemeral
Unnamed Drainage Ditch	From Holly Springs (Lagoon #1) to Nunnally Creek	Ephemeral
Unnamed Drainage Ditch	From Holly Springs (Lagoon #3) to Big Spring Creek	Ephemeral
Unnamed Drainage Ditch	From Lambert to Muddy Bayou	Ephemeral

Yazoo River Basin Continued		
Waters	**Location**	**Classification**
Unnamed Drainage Ditch	From Leland to Black Bayou	Ephemeral
Unnamed Drainage Ditch	From Lurand to the Big Sunflower River	Ephemeral
Unnamed Drainage Ditch	From Rolling Fork (East Lagoon) to the Little Sunflower River	Ephemeral
Unnamed Drainage Ditch	From Rolling Fork (West Lagoon) to Indian Bayou	Ephemeral
Unnamed Drainage Ditch	From Ruleville to the Quiver River	Ephemeral
Unnamed Drainage Ditch	From Shaw to Porter Bayou	Ephemeral
Unnamed Drainage Ditch	From Shelby to Mound Bayou	Ephemeral
Unnamed Drainage Ditch	From Simmons Farm Raised Catfish (Yazoo County) to Lake George	Ephemeral
Unnamed Drainage Ditch	From Sledge to David Bayou	Ephemeral
Unnamed Drainage Ditch	From Tunica to Whiteoak Bayou	Ephemeral
Unnamed Drainage Ditch	From Winstonville to Mound Bayou	Ephemeral
Wall Doxey State Park Reservoir (Spring Lake)	Marshall County	Recreation


Yazoo River Basin
Water Quality Standards
Scale: 1:1,800,000
5 0 5 10 15 20 Miles
Legend
Interstate
US Highway
County Boundary
Basin Boundary
City
Gulf or Lake
Major River
Water Quality Standards Classification
Public Water Supply
Shellfish Harvesting
Recreation
Ephemeral Stream
Fish & Wildlife
Mississippi Basins
This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division, Water Quality Assessment Branch, Data Management Section on 11 April 2005.
This map is contained in the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters, Adopted 2005
Projection: Mississippi Transverse Mercator
The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.
MDEQ
Desoto
Benton
Tippah
Tate
Marshall
Tunica
Lafayette
Union
Panola
Coahoma
Quitman
Pontotoc
Yalobusha
Tallahatchie
Calhoun
Chickasaw
Bolivar
Grenada
Clay
Leflore
Webster
Sunflower
Montgomery
Carroll
Choctaw
Washington
Humphreys
Holmes
Winston
Attala
Leake
Neshoba
Sharkey
Yazoo
Issaquena
Madison
Scott
Newton
Warren
Hinds
Rankin
Copiah
Claiborne
Smith
Jasper
Simpson
Okatoma Creek
Chunky River
72
78
49
61
55
59

MISSISSIPPI COMMISSION ON ENVIRONMENTAL QUALITY

FINAL REGULATIONS GOVERNING BROWNFIELD VOLUNTARY CLEANUP AND REDEVELOPMENT IN MISSISSIPPI

Under the Authority of
Mississippi Code Annotated Section 49-35-21

Adopted May 27, 1999
Last Amended February 28, 2002

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

Table of Contents

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

SUBPART I. GENERAL REQUIREMENTS

Chapter 1. GENERAL

Section 101. Purpose

The purpose of these regulations is to promote the voluntary remediation of contaminated sites in Mississippi. The regulations establish remediation requirements that are based on public health and environmental risks specific to the Brownfield Agreement Site. The formats and procedures set forth in these regulations are designed to advise a person, prior to submitting an application, of the information necessary to achieve the adequate and cost-effective characterization and remediation of a Brownfield Agreement Site. All information requirements may not be applicable for all Brownfield Agreement Sites as long as the Applicant provides written justification.

Section 102. Authority

The Mississippi Department of Environmental Quality (MDEQ) and the Mississippi Commission on Environmental Quality (MCEQ) are authorized to administer the requirements of the Act and the regulations promulgated there under as set forth in Mississippi Code Annotated Section 49-35-1 through 27.

Section 103. Definitions

As used in these regulations, the following terms have the specified meaning, except where otherwise indicated.

Absorption factors mean the chemical-specific values that represent the fraction of the chemical from an environmental medium such as soil that can pass across the exchange boundaries of the organism (e.g., skin, lungs, gut) for absorption. The relevant absorption factors for chemicals into humans will be those published by EPA (e.g., the EPA's Dermal Exposure Assessment: Principles and Applications [EPA/600/8-91/011B), EPA Region 4's Supplemental Guidance to Risk Assessment Guidance to Superfund [RAGS]), those published in peer-reviewed literature, or other appropriate values as approved by MCEQ.

Act means the Mississippi Brownfields Voluntary Cleanup and Redevelopment Act, Miss. Code Ann. Sections 49-35-1 through 27.

AIHC means American Industrial Health Council.

Application means forms prescribed by MCEQ or MDEQ, the accompanying information specified in the forms, and other additional information requested by the MCEQ or the MDEQ pursuant to Section 49-35-7 of the Act.

Applicant or ***"Brownfield Applicant"*** means the person(s) who has applied to become a Brownfield Party.

Aqueous Solubility means the solubility of a pure substance in water. It is the maximum amount of a chemical that will dissolve in pure water at a temperature of 30 degrees Celsius.

Assessment endpoint means the explicit expressions of the actual environmental value that is to be protected. See also the definition for measurement endpoint.

ASTM means the American Society for Testing and Materials.

Background chemical means a substance which is: (a) consistently present in the environment at and in the vicinity of the Brownfield Agreement Site; and (b) attributable to geologic or natural conditions.

Bioconcentration means the uptake and accumulation or concentration of a chemical in an individual organism.

Biomagnification means the accumulation of a chemical (that has the property to bioconcentrate) in humans or an animal through the food chain, i.e., from the ingestion of organisms or other animals tainted with the chemical.

Brownfield Agreement or "***Agreement***" means an agreement between the Applicant and MCEQ for the remediation of a Brownfield Agreement Site.

Brownfield Agreement Order or "***Agreement Order***" means an Order issued by the Commission which embodies a Brownfield Agreement.

Brownfield Agreement Site or "***site***" means Brownfield Property that is remediated under a Brownfield Agreement. The Site shall consist of the Brownfield Property that is the subject of the application and any other Brownfield Property:

1. for which the source of contamination is environmental contamination or activities on or under the Brownfield Property that is the subject of the application, and
2. concerning which the MCEQ determines that remediation is necessary.

Brownfield Party means any person who desires to execute and implement a Brownfield Agreement.

Brownfield Property means any property where use is limited by actual or potential environmental contamination, or the perception of environmental contamination, and that is or may be subject to remediation under any state environmental law, regulation or program or under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 USCS 9601 et seq. (1997)(CERCLA), but does not include any of the following:

1. sites proposed by the United States Environmental Protection Agency for the National Priorities List (NPL) but not listed on the NPL or sites listed on the NPL, except those NPL sites for which the United States Environmental Protection Agency has issued certificates of completion of the remediation set forth in the records of decision for those sites or concerning which EPA has subsequently determined that listing is inappropriate;
2. sites for which an administrative or judicial order is issued which is still in effect or enforcement action commenced under CERCLA or Sections 3001(b)(3)(B)(iv.), 3008(h), 3013(a) or 7003(c) of the Resource Conservation and Recovery Act of 1976, as amended, 42 USCS 6901 et seq. (1994 and Supp. 1997) (RCRA); or
3. sites undergoing corrective action under RCRA Section 3004(u), 3004(v) or 3008(h), except those sites that the United States Environmental Protection Agency determines have completed corrective action.

Brownfields Corrective Action Plan (CAP) means a document or a set of documents that outlines remedial objectives, scope of the design investigation, conceptual designs, pre-construction design specifications, construction management and schedules, quality control, and operation and maintenance in connection with remedial actions conducted pursuant to the Act and these regulations. The content and format of the CAP is provided in MDEQ's "Brownfields Corrective Action Plan Format," which may be required as part of the application.

Brownfields Corrective Action Report means a document or a set of documents that provide information supporting the remediation of human health and environmental risks specific to the Brownfield Agreement Site to levels appropriate for the land-use of the Site.

Brownfields Site Characterization Report means a document or a set of documents that provides information supporting the delineation of the vertical and horizontal extent of contamination on or under a Site in order to develop remediation requirements for the Site or to determine that remediation is necessary. The contents and format of the Brownfield Site Characterization Report is provided in MDEQ's "Brownfields Site Characterization Report Format," which shall be required as part of the application.

Carcinogen means any substance which may cause cancer as identified by the U.S. Environmental Protection Agency (EPA).

Carcinogenic risk or ***upperbound excess lifetime carcinogenic risk*** means the likelihood of developing cancer or tumor incidence for an individual from lifetime exposure to a carcinogen, not including exposure to cancer causing background chemicals.

CERCLA means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund) (Public Law 96-510), as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. 9601 et seq.

Chemical of Concern (CoC) means a contaminant or a chemical that poses public health and environmental risks specific to the Brownfield Agreement Site.

Complete Application means a Brownfield Agreement Application which the MDEQ determines contains information addressing each application requirement of the Act and these regulations and contains all information necessary to initiate formal processing of the application, as determined by MCEQ. Only a complete application constitutes an application for the purposes of Section 49-35-7(2).

Cost effective, when applied to remediation requirements, use restrictions, or engineering controls, means that these measures are economically and technically feasible and practicable in protecting human health or the environment for the intended use of a Brownfield Agreement Site.

Cumulative excess cancer risk means the upper bound on the estimated cancer risk above the background risk associated with exposure to multiple hazardous substances or multiple exposure pathways.

Cumulative site risk means the summation of risks to a human receptor or ecological receptor from one or more hazardous substances. The cumulative site risk for noncarcinogens is the site's hazard index. The cumulative site risk for carcinogens is the cumulative excess cancer risk.

DAF means a Dilution-Attenuation Factor approved for use in the Brownfields Program by MDEQ.

Deterministic risk assessment means the traditional approach to estimating a site's potential risk by solving the risk algorithm (intake multiplied by the dose-response) analytically by the assignment of average or high-end values in the algorithm to calculate the risk (dependent variable) posed by independent variables (such as exposure factors and exposure point concentrations that produce the intake).

DNAPL means dense non-aqueous phase liquid.

Ecological receptor of concern means specific ecological communities, populations, or individual organisms protected by federal or state laws and/or regulations, or those local populations which provide important natural or economic resources, functions and values.

Ecosystem means an integrated, self-functioning system consisting of interactions among both the biotic community and abiotic environment within a specified location in space and time.

Effective Solubility means the solubility of a compound that will dissolve from a chemical mixture (e.g., gasoline). The effective solubility of a compound from a chemical mixture is less than its aqueous solubility.

Engineering control means an existing condition or modification to a Brownfield Agreement Site that reduces or eliminates the potential for exposure to contaminants. These conditions or modifications may include, but are not limited to, physical or hydraulic control measures (such as groundwater recovery trenches and leachate collection systems), groundwater treatment systems, engineered caps, liner systems, slurry walls, or permanent structures, but shall not include the exclusive use of security fencing.

Environmental contamination means the presence of hazardous substances or constituents that pose unacceptable risks to the environment, humans, or ecological receptors.

EPA means the United States Environmental Protection Agency.

Executive Director means the Executive Director of the Mississippi Department of Environmental Quality.

Exposure means contact of an organism with a chemical or physical agent. Exposure is quantified by exposure point concentration in an exposure medium (such as soil, sediment, air, groundwater, and surface water) and the intake of the medium (expressed as the amount of the medium taken into the body by the organism per unit body weight per day).

Exposure factors means values used to estimate exposure in risk assessment, such as the number of days per year, number of years that exposure is expected to occur, the amount of contaminated media that a person or an organism might contact per day, the extent of uptake or absorption of the medium contacted, and the body weight.

Exposure pathway means the manner by which a person or an organism may be exposed to a chemical of concern or contaminant. A complete exposure

pathway consists of a source, a release from a source, a migration and transport mechanism, an exposure medium (e.g., air) or media (in cases of intermediate transfer), an exposure point, and an exposure route.

Exposure point concentration (EPC) is the amount of CoC available at the exchange boundaries of the organism (e.g., skin, lungs, gut) for absorption by humans.

Exposure route means the portal of entry which results in the intake of a contaminated medium into the human body or an organism (e.g., ingestion, dermal contact, and inhalation).

Fate and Transport means the behavior and movement of a chemical through an environmental media. The movement is affected by many factors such as sunlight (UV radiation), wind-blown or wave actions, microbial activity, groundwater and surface water flow, chemical properties (e.g., solubility, density), physical-chemical properties of the medium (e.g., grain size, porosity, permeability, and organic carbon content), and presence of solubility-enhancing solvents or buried piping and utilities.

Free product means a discharged hazardous substance or environmental pollutant that is present in the environment as a floating or sinking non-aqueous phase liquid. Free Product is considered present if (1) measurable using best available technologies, or (2) for groundwater, the concentration of the chemical of concern is at or above the aqueous solubility limit for that pure compound or the effective solubility limit for that compound in a chemical mixture, or (3) for soils, the concentration of the chemical of concern is at or above the soil saturation limit for that compound for all chemicals with a melting point less than 30 degrees Celsius.

Groundwater quality standard means the chemical-specific numerical value published by EPA as Maximum Contaminant Level (MCL). Where the groundwater intersects surface water, ambient water quality criteria values identified in the “Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters” or other values determined by the MDEQ to be protective will be applicable.

Habitat means the area or type of environment to which an organism or biological population is indigenous.

Hazard index means the sum of the hazard quotients for multiple substances and/or multiple exposure pathways.

Hazard quotient means the value which quantifies non-carcinogenic hazard for a single chemical for an individual receptor over a specified exposure period. The hazard quotient is equal to the ratio of an intake of a chemical to the

chemical's reference dose. Hazard quotient shall be based on similar-acting non-carcinogens, i.e., systemic toxicants that act on the same organ or organ system.

Hazardous substance mean any substance which is a hazardous substance as defined in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and any substance which is designated as a hazardous substance under Section 102 of such Act.

Integrated Risk Information System (IRIS) means the database system of that name developed and maintained by EPA.

Land-use restriction or ***institutional control*** means the limitation on use of or access to a Brownfield Agreement Site to reduce or eliminate the potential for exposure to contaminants. These restrictions may include, but are not limited to, deed restrictions, use restrictions, restrictive covenants, or restrictive zoning.

Legal and Equitable Interest Owners mean persons who have a legal or equitable interest in the Brownfield Agreement Site and may include, but are not limited to, property owners, tenants, or lending institutions.

LNAPL means light non-aqueous phase liquid.

Local government means a county or municipality within the State of Mississippi.

MCL means maximum contaminant level published by EPA under the Safe Drinking Water Act (42 United States Code 300f et seq.).

MCEQ means the Mississippi Commission on Environmental Quality.

MDEQ means the Mississippi Department of Environmental Quality.

Measurement endpoint means the measurable responses to chemicals or physical changes in the environment that are related to the valued characteristics chosen as the assessment endpoint.

mg/Kg means milligram per kilogram.

mg/L means milligram per Liter.

Monitored Natural Attenuation means remediation by natural attenuation that is monitored to determine achievement of remediation goals over a specified time period.

Natural Attenuation means the reduction in the concentration or mass of a substance and its breakdown products in an environmental medium (such as groundwater), due to naturally occurring physical, chemical, and biological processes without human intervention or enhancement. These processes include, but are not limited to, dispersion, diffusion, sorption and retardation, and degradation processes such as biodegradation, abiotic degradation and radioactive decay.

NAPL means non-aqueous phase liquid, which can be heavier or lighter than water. NAPL that is lighter than water is called light non-aqueous phase liquid (LNAPL) or a floater. NAPL that is heavier than water is called dense non-aqueous phase liquid (DNAPL) or a sinker.

NPL means the National Priorities List published by EPA pursuant to CERCLA Section 105.

Person means any person as defined in Section 17-17-3 of the Mississippi Code Annotated.

Potentially responsible party means a person who is or may be liable for remediation under any state or federal law, regulation, or program.

Previously unknown contaminant means any chemical or contaminant that has not been delineated in the Brownfields Site Characterization Report and/or remediated to a risk-level appropriate for the land-use of the Site as described in the Brownfields Corrective Action Report.

PRG means the Preliminary Remediation Goal developed by EPA Region 9 for a specific chemical.

Principal threat chemical means a CoC, by itself or with other CoCs, which has been shown to contribute a substantial part (majority) of the total Site risk based on a Tier 3 site-specific risk assessment.

Probabilistic risk assessment means a site-specific risk assessment performed using a statistical sampling technique that produces a probabilistic approximation of the potential risk from the site-specific risk assessment algorithm or model.

Property boundary or ***site boundary*** means the boundary of the Brownfield Agreement Site.

Quality Assurance Project Plan (QAPP) means a document or set of documents that integrates all technical and quality aspects of a project, including planning, implementation, and assessment. The purpose of the QAPP is to document planning results for environmental data operations and to provide a

project-specific "blueprint" for obtaining the type and quality of environmental data needed for a specific decision or use.

Quality Management Plan (QMP) means a document or set of documents that describes how an organization structures its quality system and describes its quality policies and procedures, criteria for and areas of application, and roles, responsibilities, and authorities. It also describes an organization's policies and procedures for implementing and assessing the effectiveness of the quality system.

Quantitation limit means the lowest concentration for an analytical test method and sample matrix at which the quantity of a particular substance can be routinely measured with a stated degree of confidence. The quantitation limit for a particular sample analysis and analytical method is called the sample quantitation limit (SQL) or reporting limit.

Radioactive material means a radionuclide or substance that spontaneously emits ionizing radiation or particles.

RBC means the risk-based concentration developed by utilizing equations developed by EPA Region III for a specific chemical.

RBSL means risk-based screening levels developed by ASTM in the Emergency Standard Guide (ES 38-94) and in the Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM E 1739-95), 1995.

RCRA means the Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

Readily apparent harm means the observations of stressed biota and/or their habitat.

Receptor means environmental resources, including but not limited to, plant and animal species, humans, sensitive environments and habitats, water supply wells, and locations that have the potential to be, or have actually been, exposed to contamination.

Reference concentration (RfC) means a value representing a daily exposure level for the human population, including sensitive subpopulations, that is not likely to cause deleterious and non-reversible adverse noncancer health effects during a chronic or subchronic exposure period. Reference concentration is generally expressed in the unit of milligram per cubic meter (mg/m^3).

Reference dose (RfD) means a value representing a daily exposure level for the human population, including sensitive subpopulations, that is not likely to cause deleterious and non-reversible adverse noncancer health effects during a chronic

or subchronic exposure period. Reference dose is generally expressed in the unit of milligram per kilogram body weight (mg/Kg/day).

Regionally Prevalent Chemical means a substance found throughout a substantial geographic region, as approved by MDEQ (e.g., Delta region), that can be attributed to conditions, as approved by MDEQ, such as atmospheric deposition and aerial application.

Remediation means action to cleanup, mitigate, correct, abate, minimize, eliminate, control, treat, remove, or to implement institutional and/or engineering controls in order to prevent the spreading, migration, leaking, leaching, volatilization, spilling, transport, exposure, or further release of a contaminant to the environment in order to protect public health or the environment.

Remediation goal (RG) means the target cleanup level or objective that is cost-effective, implementable, and protective of human health and the environment. The RG can be quantitative, i.e., numerical cleanup level (generally expressed in mg/kg [soil or sediment] or mg/L [water]) or can be qualitative (e.g., basis for an engineered barrier, to prevent/minimize exposure). Fencing alone cannot be the RG.

Restricted site means a Brownfield Agreement Site where access to the general public is limited and/or controlled. The restrictions may include, but are not limited to, deed restrictions, use restrictions, restrictive covenants, or restrictive zoning.

Risk means the likelihood or probability that a hazardous substance, when released to the environment, will cause adverse effects in exposed humans or other biological receptors. Risk is further classified as carcinogenic (from exposure to carcinogens) or noncarcinogenic (from exposure to noncarcinogens, i.e., systemic toxicants).

Risk assessment or "***site-specific risk assessment***" means a site-specific characterization of the current or potential threats that may be posed to human health and the environment by contamination migrating to or in groundwater or surface water, discharging to the air, leaching through or remaining in soil, bioaccumulating in the food chain, or other complete and significant exposure pathways identified in the Site Conceptual Exposure Model (SCEM). Key components of a risk assessment are the identification of hazard (i.e., identifying site-related chemicals and their concentrations in the exposure media), exposure assessment (identifying complete and significant exposure pathways and quantifying intake), toxicity assessment (identifying the toxic effects and dose-response [toxicity value]), risk characterization, and discussion of uncertainties. For the purposes of these regulations, a Tier 3 Risk Assessment is considered a "site-specific risk assessment."

Risk-based remediation requirement means remediation a requirement based on public health and environmental risks specific to a Brownfield Agreement Site.

Risk Management means the evaluation of options or measures to reduce risk, including, but not limited to, such options as no further action, monitoring only, or gathering additional data before making a decision.

Sediment means particles in surface waters or wetlands or on the bottom of surface waters or wetlands that are derived from the erosion of rock, minerals, soils and biological materials, as well as chemical precipitation from the water column. Sediment particles are transported by, suspended in or deposited by water.

Sensitive environment means an area of exceptional environmental value, where a discharge or release could pose a greater threat than a discharge to other areas, including but not limited to: wetlands; habitat used by state or federally designated endangered or threatened species; national or state fish and wildlife refuges and fish and wildlife management areas; and state and federal designated wild and scenic rivers.

Site Conceptual Exposure Model (SCEM) means a graphical presentation of actual or hypothetical conditions, based on current data and understanding of the Site, under which the chemicals of concern or contaminants from a Brownfield Agreement Site may be released from a source, moved (migration/transport) in the environment, present in the exposure media, and absorbed by the receptor through the exposure routes. The SCEM will be used to identify data needs to assess risk and may be modified to consider new data in determining whether an exposure pathway is incomplete or complete. The SCEM is used in the development of remediation goals and identification of remedial options.

Slope factor means the upperbound estimate of probability in the occurrence of excess cancer risk (increase in cancer risk over the background risk) associated with a specific carcinogen for an individual who is exposed to a unit of intake over lifetime. The unit for a slope factor is the probability per unit intake, i.e., the inverse of milligram per kilogram body weight $(mg/Kg/day)^{-1}$.

SPLP means Synthetic Precipitation Leaching Procedure, an EPA analytical method (Method 1312) published in SW-846.

SSL means a soil screening level developed by EPA in the Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128).

Stakeholders mean persons or parties who have a legitimate interest in the remediation and redevelopment of the Brownfield Agreement Site. These persons include, but are not limited to, the property owners adjoining the Brownfield Agreement Site property and local governments.

SW-846 means Test Methods for Evaluating Solid Waste - Physical/Chemical Methods published by the U.S. Environmental Protection Agency, Office of Solid Waste on November 1986, and its updates.

Systemic Toxicant means a substance or agent that may enter the body, injure an organ or organ system, or have an effect other than causing cancer. The toxicity value used for risk characterization of the chronic effect for a systemic toxicant is the reference dose (RfD).

Target remediation goals (TRGs) mean risk-based media concentrations utilized in the Tier 1 evaluation of human health and environmental impacts in these regulations. Soil TRGs are soil concentrations developed by MDEQ for individual chemicals to address the soil ingestion and inhalation exposure pathways and environmental risks. Groundwater TRGs are either the groundwater quality standards (current MCLs published by EPA) or risk-based remediation goals derived by MDEQ. Soil and groundwater TRGs are provided in MDEQ's Risk Evaluation Procedures developed for these regulations. Surface water TRGs are the water quality criteria published by the MDEQ. TRGs are to be compared with the exposure point concentrations. TRGs alone do not always trigger the need for response actions or define unacceptable levels of contaminants in soil or groundwater. The Tier 1 TRGs may either be used as "default" remediation goals or as screening values that will initiate a Tier 2 Evaluation or Tier 3 Evaluation.

Target risk means a de minimis or insignificant risk to humans below which further action (remediation, institutional control, monitoring, etc.) is not warranted.

Technical Impracticability or "***Technically impracticable***" means the inability to achieve certain remediation requirements and is based on engineering feasibility and reliability, cost-effectiveness, and risk-based considerations. For the purposes of these regulations, EPA's OSWER Directive 9234.2-25: "Guidance for Evaluating the Technical Impracticability of Groundwater Restoration," dated September 1993 may be utilized in developing a demonstration of technical impracticability with regard to groundwater and soil remediation, free product removal, and other site-specific conditions approved by MDEQ.

Tier 1 Evaluation means a comparison of CoC exposure point concentrations in soil or sediment with chemical-specific TRGs for the evaluation of human health and environmental impacts and an evaluation of ecological impacts through completion of an Ecological Checklist. Ecological evaluations are used to determine whether ecological receptors of concern are present and may include, but are not limited to, the collection of field observation data for any readily apparent harm on the ecological receptors of concern.

Tier 2 Evaluation means a more in-depth evaluation of site-specific conditions beyond the Tier 1 Evaluation methodology. The Tier 2 Evaluation may include, but is not limited to, an evaluation of site-specific conditions by (1) comparing the UCL of the Mean for a CoC applying statistical methods to the Tier 1 TRGs, (2) comparing EPCs to calculated background chemical concentrations, (3) comparing EPCs to calculated regionally prevalent chemical concentrations, (4) utilizing site-specific variables (i.e., exposure frequency, exposure duration, etc.) to calculate site-specific RGs, (5) eliminating/minimizing exposure routes, (6) conducting an analysis of Petroleum Hydrocarbons using TPH Fractioning, or (7) other methods approved by MDEQ.

Tier 3 Evaluation means a site-specific risk assessment (Risk Assessment). The Tier 3 human health risk evaluation is the characterization of the risks of cancer and adverse non-cancer health effects in humans in accordance with EPA's Risk Assessment Guidance for Superfund (RAGS) and other risk assessment guidance published by EPA including, but not limited to, the Adult Lead Model and the Integrated Exposure Uptake Biokinetic Model (IEUBK) for lead. The Tier 3 ecological risk evaluation is the characterization of environmental effects qualitatively or quantitatively in accordance with the EPA's Framework for Ecological Risk Assessment guidance, as amended.

Treatability study means the testing and documentation activities to evaluate the effectiveness of a proposed remediation method (remedial action) prior to full scale design and implementation. Treatability study includes, but is not limited to, bench scale studies and pilot scale studies, and may be required by the Corrective Action Plan if the remediation method has not been evaluated by EPA or an independent consultant or trade association to be capable of treating the medium (or medium of similar physical and chemical characteristics) at the Brownfield Agreement Site.

Unacceptable risks mean that the carcinogenic risks, non-carcinogenic hazards, or ecological risks posed by the CoCs at the point of exposure, according to a Tier 1, Tier 2, or Tier 3 Evaluation, have exceeded established target risk levels for humans or ecological receptors. The term can also be applied qualitatively if there is a sufficient basis to conclude that the likelihood of impact to the ecological receptors of concern or the sensitive environment is high based on findings of an ecological risk assessment.

Unrestricted site, relevant to a Brownfield Agreement Site, means that the use of the property is not restricted by an applicable Brownfield Agreement.

Volatile Compounds means those compounds with a Henry's Law Constant greater than 1×10^{-5} and a molecular weight less than 200 g/mole, for all media.

Wetlands means those areas where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation, and which have soils indicative of wet (hydrid) conditions.

Section 104. Acronyms

CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund) (Public Law 96-510), as amended by the Superfund Amendments and Reauthorization Act of 1986
CoC	Chemical of Concern
EPA	United States Environmental Protection Agency
MCEQ	Mississippi Commission on Environmental Quality
MCL	Maximum Contaminant Level
MDEQ	Mississippi Department of Environmental Quality
NPL	EPA's National Priorities List
OSWER	EPA's Office of Solid Waste and Emergency Response
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
QA/QC	Quality Assurance/Quality Control
RBCs	Risk-Based Concentrations
RCRA	Resource Conservation and Recovery Act of 1976, as amended, 42 USC 6901 et seq.
RG	Remediation Goal
SCEM	Site Conceptual Exposure Model
TPH	Total Petroleum Hydrocarbon
TRGs	Target Remediation Goals
VEP	Mississippi Uncontrolled Site Voluntary Evaluation Program
UCL	Upper Confidence Level

Section 105. Applicability

(a) The following sites are not eligible for inclusion in a Brownfield Agreement Site:

(1) Sites proposed by the EPA for the National Priorities List (NPL) but not listed on the NPL or those sites listed on the NPL, except those NPL sites for which the United States Environmental Protection Agency (EPA) has issued certificates of completion of the remediation set forth in the records of decision for those sites or concerning which EPA has subsequently determined that listing is inappropriate.

(2) Sites for which an administrative or judicial order is issued which is still in effect or enforcement action commenced under CERCLA or

Sections 3001(b)(3)(B)(iv), 3008(h), 3013(a) or 7003(c) of the Resource Conservation and Recovery Act of 1976, as amended, 42 USCS 6901 et seq. (1994 and Supp. 1997) (RCRA) and which is still in effect; and

(3) Sites undergoing corrective action under RCRA Section 3004(u), 3004(v) or 3008(h), except those sites that the United States Environmental Protection Agency determines have completed corrective action.

(b) The MCEQ may exclude properties that pose an imminent and substantial threat to human health and the environment and require immediate remedial and/or cleanup action.

(c) The MCEQ may exclude properties that are under an existing MCEQ agreement or order.

(d) Sites that are participating in the Uncontrolled Site Voluntary Evaluation Program (VEP) pursuant to Mississippi Code Annotated Section 17-17-54 prior to the effective date of these regulations shall not be required to pay the initial $2000.00 application fee under these regulations if the Applicant is current on any payments due MDEQ under the VEP.

(e) In order to be eligible for the Brownfield Program, an Applicant must satisfy the requirements regarding financial resources, technical resources, managerial resources, and compliance history set forth in these regulations.

(f) Only Brownfield Properties which require remediation may be included in a Brownfield Agreement.

(g) The Brownfield Party shall comply with all applicable federal and state laws and regulations.

(h) Nothing in the Brownfield Agreement or these regulations shall be construed to convey or determine any interest in property.

(i) Nothing in the Brownfield Agreement or these regulations shall be construed to be an allocation of costs or an indemnification by the State, MDEQ, and/or MCEQ.

Chapter 2. BROWNFIELD APPLICATION REQUIREMENTS

Section 201. General Requirements

(a) Brownfield Agreement applications must be filed in the format prescribed by MDEQ. Prior to approval, the application must be complete and must contain all of the information required by MDEQ, including, but not limited to, information necessary to demonstrate the following:

(1) That as a result of the proposed remediation, the Brownfield Property will be suitable for the use or uses specified in the application while fully protecting public health and the environment;

(2) That the Brownfield Party has or can obtain the financial, managerial, and technical resources to implement fully and complete the proposed remediation and to assure the safe use of the Brownfield Property;

(3) That the current owners of all surface interests (including legal and equitable) in the Brownfield Properties that are the subject of the application have given written approval for inclusion of their property interest in the Brownfield Agreement Site. This approval shall be provided on the form prescribed by MDEQ;

(4) That the Brownfield Party will comply with all applicable procedural requirements; and

(5) That all items contained in the application form have been addressed by either providing the required information or stating that the item is not applicable. In the event that an item is considered not applicable, the Brownfield Party must include a written justification in the application that demonstrates to the satisfaction of MDEQ that the item is not applicable to the application.

(b) If the Brownfield Applicant has demonstrated to the satisfaction of MDEQ that activities on or under the Brownfield Agreement Site involving the use, extraction, or production of mineral interests will not increase the level of risk to the public health or the environment beyond the level that forms the basis for the risk-based remediation requirements in the Brownfield Agreement, then the current owners and lessees of those mineral interests (including legal and equitable) in or under the Brownfield Properties that are the subject of the application are not required to give written approval for the submission of the application and the inclusion of their property interest in the Brownfield Agreement Site. All owners and lessees of a legal or equitable interest in the surface and/or mineral estates of the Brownfield Properties that are the subject of the application who do not give written approval for execution of the Brownfield

Agreement shall be subject to Section 701(e)(3) of these regulations. Otherwise, written approval of the mineral interest owner(s) for inclusion of the Brownfield Property in the Brownfield Agreement site must be provided on the form prescribed by MDEQ;

(c) As part of the application, the Applicant shall submit a title certificate prepared by an attorney who is licensed to practice law in the State of Mississippi identifying the following:

(1) The legal description of the Brownfield Property;

(2) The names and addresses of all persons who have an interest in the Brownfield Properties that are the subject of the application as defined in Section 201(a) and (b) of these regulations; and

(3) The names and addresses of all surface-interest property owners contiguous to the Brownfield Property.

(d) As part of the application, the Applicant shall submit a copy of any local zoning requirements, classifications, statutes or ordinances, comprehensive zoning plan designations, and/or any current land use approvals obtained regarding the Brownfield Property and the property contiguous to the Brownfield Property.

(e) At the time a Brownfield Agreement application is filed, the Applicant shall submit $2000.00 in the form of a check or money order made payable to MDEQ as advance costs for the costs described in paragraph (f).

(f) At the time a Brownfield Agreement application is filed, the Applicant must execute a statement in the form required by MDEQ that provides that the Applicant agrees to pay all direct and indirect costs of MDEQ associated with the processing of the Brownfield Agreement application and administration of the Brownfield Agreement.

(g) As part of the application, the Applicant shall submit a schedule which sets forth its estimate of the amount of time it expects will be required to complete the Brownfield Agreement.

(h) With regard to financial resources, the applicant shall be required to file with MDEQ, as part of its application, an estimate of the costs of performance of all requirements of the Brownfield Agreement including corrective action, operation and maintenance, monitoring, post-closure activities, and contingency actions. The cost estimate shall be based on a professional third party's cost of performing all of the requirements of the Brownfield Agreement. These cost estimates must be submitted to MDEQ for its concurrence. The applicant shall provide MDEQ proof of financial

resources in an amount equal to the cost estimates for performance of all requirements of the Brownfield Agreement including corrective action, operation and maintenance, monitoring, closure, post-closure activities, and contingency actions. Proof of financial resources, if applicable, may include the following financial instruments: insurance, escrow accounts; surety bonds, including performance or financial guarantee bonds; irrevocable letters of credit; certificates of deposit; securities; and/or other documents approved by MDEQ. The financial instruments shall be issued by a surety company or financial institution licensed to do business in the State of Mississippi. MDEQ may, in its discretion, exempt an applicant from these financial resource requirements based on the applicant's demonstration of financial resources submitted to MDEQ in another MDEQ program and/or such other factors deems appropriate. In the event the cost estimates to complete all requirements in the Brownfield Agreement increase or decrease, MDEQ may require the Brownfield Party to submit additional and/or amended financial instruments.

(i) With regard to technical resources, the applicant shall be required to file with the MDEQ, as part of the application on a form prescribed by the MDEQ, a statement certifying that the Applicant shall utilize a consulting firm listed on the approved list of Brownfield Consulting Firms or the staff of the MDEQ.

(j) With regard to managerial resources, the applicant shall be required to file with MDEQ, as part of its application on a form prescribed by MDEQ, a statement of key personnel considered essential to the work being performed under the Brownfield Agreement. Prior to removing, replacing, or diverting any of the specified individuals, the Brownfield Party shall notify MDEQ in advance and shall submit justification, including proposed substitutions, in sufficient detail to demonstrate that the substitutions have sufficient qualifications to manage all assignments associated with the Brownfield Agreement Site.

(k) With regard to compliance history, the MDEQ may require the applicant to submit the following:

(1) A statement of whether the applicant has had a federal or state environmental permit revoked in the five years preceding the date of submission of the Brownfield Agreement application. If any revocation has occurred, the applicant will be required to submit a brief explanation of the facts involving the revocation including: identification of the authority that revoked the permit and the stated reasons; the date, location and type of any administrative or judicial proceedings initiated concerning the revocation; and the current status of the proceedings.

(2) A list of all orders, citations, and notices of violation issued against the Applicant during the five years preceding the date of submission of the application for any violations or alleged violations of environmental permits, laws and/or regulations. For each document listed, the Applicant shall include a brief description of the particular violation alleged, the terms of the order, including any required action and penalty, and the current status of the proceeding.

(3) MDEQ may require the Applicant to submit additional information with regard to compliance history.

(l) The applicant shall submit all other information required by MDEQ.

Section 202. Procedural Requirements

(a) Within thirty (30) days after the date an application is submitted to MDEQ, MDEQ shall review the application to determine whether the application is a complete application and forward a letter to the Applicant advising either (1) that the application is complete or (2) that the application is incomplete and listing the specific sections that must be submitted or supplemented to make the application complete.

(b) Within thirty (30) days after the date that MDEQ forwards a letter to the Applicant advising that the application is complete, MCEQ shall issue an order which sets forth a schedule for:

(1) the identification of other Brownfield Property that has been impacted by activities on or under the Brownfield Property that is the subject of the application;

(2) MDEQ's technical review of the application; and

(3) the Brownfield Party's submission of additional information required by MDEQ.

(c) The Applicant shall promptly update and/or correct information previously submitted as part of the application whenever the Applicant discovers that this information is incomplete or inaccurate.

(d) If Brownfield Property other than that property which is the subject of the original application is identified as necessary for inclusion in the Brownfield Agreement Site, the Brownfield Party shall obtain written approval, on the form prescribed by the MDEQ, from all persons who have an interest in the additional Brownfield Property for inclusion of that Brownfield Property in the Brownfield Agreement Site, in accordance with Section 201(a)(3) and (b) of these regulations.

(e) If MDEQ's technical review indicates that no remediation is required at the Site, MDEQ will issue a letter so stating.

Section 203. Brownfield Consulting Firm Requirements

(a) In order to be listed on the approved list of Brownfield Consulting Firms, a firm must, at a minimum,

(1) Submit an application to MCEQ for its approval, in a format prescribed by MDEQ;

(2) Have as an employee either a Professional Engineer or a Professional Geologist, registered in the State of Mississippi, with at least four (4) years experience in hazardous site characterization and remediation of which one year must be within five (5) years preceding the date of the application;

(3) Have either as an employee or as a subcontractor a Professional Engineer or a Professional Geologist (whichever Professional designation is not satisfied by Section 203(a)(2) of these regulations), registered in the State of Mississippi, with (a) at least four (4) years experience in hazardous site characterization and remediation of which one year must be within five (5) years preceding the date of the application and (b) a current certificate of comprehensive general liability insurance (or other insurance acceptable to MDEQ) of at least $1,000,000.00 or greater as required by MDEQ;

(4) Submit a Quality Management Plan to MDEQ for its approval, in a format prescribed by MDEQ;

(5) Supply a current certificate of comprehensive general liability insurance (or other insurance acceptable to MDEQ) of at least $1,000,000.00 or greater as required by MDEQ; and

(6) Supply such other information as required by MDEQ.

(b) An approved Brownfield Consulting Firm must notify MDEQ within 10 days of any modification in the information previously submitted, and must submit updated information within 30 days of the modification. If the modification renders the firm unable to remain on the list of approved Brownfield Consulting Firms, then MCEQ may remove the firm from that list. MDEQ or MCEQ may require the Brownfield Party to certify its retention of an approved Brownfield Consulting Firm within 30 days of a determination that the Party's consultant no longer is an approved Brownfield Consulting Firm.

(c) All key personnel of an approved Brownfield Consulting Firm must attend MDEQ-approved continuing education, as required by MDEQ.

(d) An approved Brownfield Consulting Firm may be removed from the approved list for a period of time specified by the MCEQ for any of the following:

(1) Submission of false information;

(2) Failure to submit an updated application upon modification of material information, as required by Section 203(b) of these regulations;

(3) Failure to perform in a responsible manner with respect to matters including, but not limited to, responsiveness, technical competence, workmanship, or any other matter essential to the efficient and effective completion of the Brownfield Agreement, as determined by MCEQ;

(4) Failure of key personnel to attend MDEQ-approved continuing education, as required by MDEQ;

(5) Failure to meet any of the requirements of this section; and

(6) Such other good cause as determined by MCEQ.

(e) Any interested party may request a hearing before MCEQ as provided in Sections 49-17-31, 49-17-33, 49-17-35, 49-17-37, 49-17-41 or other applicable provisions of law regarding any of the provisions of this section, including but not limited to:

(1) Listing of a firm on the approved list of Brownfield Consulting Firms;

(2) Removal of a firm on the approved list of Brownfield Consulting Firms; and

(3) Denial of an application for listing of a firm on the approved list of Brownfield Consulting Firms.

(f) The listing of a Brownfield Consulting Firm does not authorize any individual to perform work from which it is restricted by any state or federal law or regulation.

(g) MDEQ may, itself, conduct those activities necessary to delineate or remediate Brownfield Property.

Chapter 3. BROWNFIELD AGREEMENT REQUIREMENTS AND PROCEDURES

Section 301. General Requirements

(a) Once MDEQ has completed its review of the application and any other information required to be submitted by the Applicant, MDEQ shall prepare a proposed Brownfield Agreement.

(b) The Brownfield Agreement shall contain the following:

(1) A description of the Brownfield Agreement Site sufficient to serve as a legal description of that Site,

(2) A description of all remediation to be conducted on or under the Brownfield Agreement Site, including:

i. A description of specific areas where remediation is to be conducted;

ii. The remediation method or methods to be employed;

iii. The financial, technical and managerial resources that the Brownfield Party will make available;

iv. A schedule of remediation activities;

v. Remediation requirements that are based on public health and environmental risks specific to the Brownfield Agreement Site;

vi. A schedule for implementation and completion of the remediation;

vii. Any land-use restrictions or engineering controls constituting any part of the remediation required by MCEQ;

viii. A requirement that the Brownfield Party shall notify MDEQ at least fourteen (14) days prior to the date scheduled for any field work to provide MDEQ an opportunity to observe, inspect, and/or collect split samples; and

ix. A plat which identifies any part of the Brownfield Property for which use is restricted.

(3) The proposed uses of the Brownfield Agreement Site after all remediation required by MCEQ is complete.

(4) A schedule for administration of the Brownfield Agreement by MDEQ.

(5) Requirements, as deemed appropriate by MCEQ, for reporting on the progress of remediation conducted on or under the Brownfield Agreement Site.

(6) Requirements as deemed appropriate by MCEQ for reporting on the status of the Brownfield Agreement Site following completion of all remediation including the status of the institutional controls, engineering controls and monitoring.

(7) Any other provisions deemed necessary by MCEQ to implement the Brownfield Agreement.

(c) Prior to approval of the Brownfield Agreement by the Commission, the Brownfield Party shall submit to MDEQ, on a form prescribed by MDEQ, a statement of consent signed by all owner(s) of interests in the Brownfield Property (other than the Brownfield Party) stating that such owners have read and understand the Brownfield Agreement and that they consent to the inclusion of their property interest in the Brownfield Agreement Site.

(d) Prior to execution of the Brownfield Agreement, and with thirty days written prior notice to MDEQ, the applicant may withdraw the Brownfield Agreement application. The applicant shall be required to pay all costs associated with the processing of the Brownfield Agreement application prior to the effective date of withdrawal. Failure to pay all accrued costs shall subject the Brownfield Party to remedies contained in Mississippi Code Annotated Section 49-17-43. In addition, MCEQ may proceed with any and all remedies available to it with regard to the Brownfield Property and/or Brownfield Applicant.

Section 302. Risk-based Remediation Requirements and Land-use Restrictions

(a) A Brownfield Agreement shall establish remediation requirements that are based on public health and environmental risks specific to the Brownfield Agreement Site and in accordance with Mississippi Code Annotated Section 49-35-7. In establishing the risk-based remediation requirements in a Brownfield Agreement, MCEQ shall consider the use of appropriate land-use restrictions and/or engineering controls proposed by the Brownfield Party. MCEQ may determine that permanent engineering controls in conjunction with appropriate land-use restrictions satisfy the remediation required by MCEQ in the Brownfield Agreement. These risk-

based remediation requirements may include contaminant-specific, state-specific, site-specific and/or likelihood-of-risk methodologies for the implementation of these risk-based remediation requirements. Any party to a Brownfield Agreement who complies with the requirements of a Brownfield Agreement may rely on these risk-based remediation requirements, land-use restrictions and engineering controls as governing the extent of remediation required to be performed by the Brownfield Party on or under the Brownfield Agreement Site for all purposes of the Act. Any risk-based remediation requirements, land-use restrictions and engineering controls implemented under a Brownfield Agreement shall be conducted in a cost-effective manner, consistent with projected future uses of the Brownfield Agreement Site.

(b) Remediation options include, but are not limited to, the use of appropriate land-use restrictions, engineering controls, monitored on-site containment, excavation, monitored natural attenuation, soil vapor extraction, dual-phase extraction, pump & treat, phytoremediation, landfarming, and/or any other remediation option or combinations thereof approved by MCEQ.

(c) The three procedures for determining risk-based remediation requirements follow:

(1) **Tier 1 Evaluation**

i. The Tier 1 human health and environmental evaluation consists of comparing the maximum or high-end concentrations or Minimum Quantitation Limits (MQLs) (if results are presented as not detected [ND]) of site-related chemicals (Chemicals of Concern [CoCs]) in soil or sediment (and groundwater or leachate, as necessary) with chemical-specific Target Remediation Goals (TRGs) for the assessment of potential risks to humans. Human health TRGs, except for surface water TRGs, are presented in MDEQ's Risk Evaluation Procedures developed for use with these regulations. The Tier 1 TRGs may either be used as "default" remediation goals or may be used as a screening tool that will trigger a Tier 2 Evaluation.

ii. The Tier 1 ecological risk screen is performed to determine whether ecological receptors of concern are present and potentially impacted. If they are present and potentially impacted, a Tier 3 assessment of ecological risk shall be performed to assess the potential ecological impact. A Tier 1 Evaluation is applicable for Sites with no known ecological receptors of concern present.

(2) **Tier 2 Evaluation**

A Tier 2 Evaluation is a more in-depth evaluation of site-specific conditions beyond the Tier 1 Evaluation methodology. The Tier 2 Evaluation may include, but is not limited to, an evaluation of site-specific conditions by (1) comparing the UCL of the Mean for a CoC utilizing statistical methods to the Tier 1 TRGs, (2) comparing EPCs to calculated background chemical concentrations, (3) comparing EPCs to calculated regionally prevalent chemical concentrations, (4) utilizing site-specific variables (i.e., exposure frequency, exposure duration, etc.) to calculate site-specific RGs, (5) eliminating or minimizing exposure to contaminants, (6) conducting an analysis of Petroleum Hydrocarbons using TPH Fractioning, or (7) other methods approved by MDEQ.

i. **Statistical Methods** - If the Brownfield Applicant can demonstrate to the satisfaction of MDEQ that the Upper Confidence Level (UCL) of the Mean for a CoC utilizing statistical methods is less than the Tier 1 TRG for that CoC, then the Brownfield Applicant shall have the option of using the UCL of the Mean instead of the highest concentration on-site using Tier 1 Methodologies. The Brownfield Applicant must demonstrate to the satisfaction of MDEQ that the data are statistically normal or can be statistically normalized.

ii. **Site Background** - CoC concentrations may be compared to site background chemical concentrations to evaluate appropriate remedial actions at the Brownfield Agreement Site in accordance with MDEQ's Risk Evaluation Procedures. To establish background chemical concentrations, the Brownfield Applicant may collect samples from locations outside of the influence of known contaminated areas and regionally prevalent chemicals and must analyze these samples using the same analytical methods as the CoC analyses. Sites where the concentrations of CoCs are at or below background chemical concentrations are subject to Sections 105(e) and 202(e) of these Regulations.

iii. **Regionally Prevalent Chemicals** - CoC concentrations may be compared to regionally prevalent chemical concentrations to evaluate appropriate remedial actions at the Brownfield Agreement Site in accordance with MDEQ's Risk Evaluation Procedures. To establish regionally prevalent chemical concentrations, the Brownfield Applicant may collect samples from locations throughout a substantial geographic region and outside the influence of known contaminated areas and must analyze these samples using the same analytical methods as the CoC analyses. Sites where the

concentrations of CoCs are at or below regionally prevalent chemical concentrations are subject to Sections 105(e) and 202(e) of these Regulations.

iv. **Site-Specific Variables** - If the Brownfield Applicant can demonstrate to the satisfaction of MDEQ that site-specific variables (i.e., exposure duration, exposure frequency, moisture content, etc.) are more representative of site conditions than the default variables utilized in the development of the Tier 1 TRGs, the Brownfield Applicant may utilize site-specific variables to develop RGs for the CoCs.

v. **Eliminate/Minimize Exposure Routes** - If the Brownfield Applicant can demonstrate to the satisfaction of MDEQ that land-use restrictions and engineering controls at the site will eliminate all complete exposure pathways or will minimize contamination exposure to levels that will be protective of human health and the environment, MDEQ may determine that further remediation is not required. The Commission considers the presence of free product to be an unacceptable potential risk to public health and the environment because it is considered to be a continuing source of contamination that may increase the level of risk that is the basis for the remediation requirements, may reduce the margin of safety provided by the remediation design, or may jeopardize the permanence of the Brownfield Agreement. Therefore, free product must be removed unless it can be demonstrated to the satisfaction of MDEQ that removal of the free product is technically impracticable. The Applicant must also demonstrate to the satisfaction of MDEQ that the contamination is confined and will remain confined within the site boundaries. Any monitoring plan must be approved by MDEQ.

vi. **Tier 2 TPH Fractioning** – For sites that do not meet the Tier 1 TPH TRGs, the Brownfield Party may either (1) conduct a more detailed evaluation of petroleum hydrocarbons using the methodology outlined in MDEQ's Risk Evaluation Procedures or (2) conduct another TPH risk evaluation of approved by MDEQ.

vii. **Other Approved Methods** - MDEQ may approve other risk evaluation methodologies under Tier 2.

(3) **Tier 3 Evaluation**

A Tier 3 Evaluation is a site-specific assessment of the baseline risk of the Site (risk posed by the Site without remediation) based on current EPA risk assessment guidance, specifically those published by the

Office of Emergency and Remedial Response (Superfund program), the Risk Assessment Forum, and selected EPA Regional Offices. In this evaluation, an assessment of risk for all completed exposure pathways to humans and/or ecological receptors must be calculated.

i. **Human Health Evaluation** - For human health, the remediation goal (RG) for each individual contaminant which is a carcinogen must be calculated to attain a Risk Level of 10^{-6} (i.e.,1 in a million). For a systemic toxicant, the remediation goal must be calculated to attain a total hazard quotient of not more than 1, except with regard to a background chemical concentration or a regionally prevalent chemical concentration. In cases where contaminants with corrective action concentrations established through federal and/or state programs (i.e., Safe Drinking Water Act maximum contaminant levels (MCLs)) are present, the MDEQ will determine the appropriate corrective action concentration on a contaminant-by-contaminant basis. MDEQ may consider an alternative quantitative or qualitative remediation goal (RG) for each individual contaminant, provided the Applicant can demonstrate to the satisfaction of MDEQ that the attainment of a Risk Level of 10^{-6} for each individual carcinogenic contaminant or a total hazard quotient of not more than 1 for each individual systemic toxicant is technically impracticable, except with regard to a background chemical concentration or a regionally prevalent chemical concentration. In no event, except with regard to background chemical concentrations, may either the cumulative (total) site carcinogenic risk exceed 1×10^{-4} for carcinogenic CoCs or the site hazard index (summation of hazard quotients) exceed 3 for non-carcinogenic CoCs affecting the same organ or organ system.

ii. **Ecological Evaluation** - For the assessment of ecological risk, the maximum or high-end soil, sediment, or surface water data must be compared with threshold or benchmark values for the protection of the ecological receptors of concern. The Brownfield Applicant must demonstrate either that the concentration of the affected media is below the threshold or benchmark values or that the hazard quotient for the individual CoCs is below 1 utilizing the quotient method.

(d) **Risk-based remediation goal** - The risk-based remediation goal (RG) may be qualitative or quantitative. A qualitative RG involves the exclusion of exposure pathways by engineering controls. A quantitative RG involves calculating the maximum numerical CoC(s) concentration in a medium which would not exceed the acceptable baseline risk at the exposure point. The numerical risk-based RG may be adjusted upward or

downward depending on risk management considerations as approved by the MDEQ.

(e) **Free Product** - Free Product refers to the presence of a hazardous substance or an environmental pollutant in the environment as a floating or sinking non-aqueous phase liquid. Free Product is considered present if measurable using best available technologies or if the concentration of the chemicals of concern in groundwater or soils is at or above the solubility limit for all chemicals or soil saturation limit for all chemicals with a melting point less than 30 degrees Celsius. On a site-specific basis, MDEQ may require either the effective solubility or the aqueous solubility to be utilized. Free product must be removed from the Brownfield Agreement Site, unless it can be demonstrated to the satisfaction of MDEQ that removal of the free product is (1) technically impracticable and that (2) the contamination is confined and will remain confined within the site boundaries.

(f) **Historical data** - Historical data approved by MDEQ may be submitted in lieu of collecting new data provided the Site characterization data requirements are summarized and presented in accordance with the Site Characterization Work Plan and Report Formats and the data was collected in a manner consistent with appropriate sampling protocols. All detailed information must be referenced in the reports including sampling protocols. In any event, relevant historical Site characterization reports shall be submitted with the application.

(g) **Site Conceptual Exposure Model (SCEM)** - The Brownfields Applicant must complete a BASELINE SCEM and a REMEDIAL SCEM on the forms prescribed by MDEQ as described in MDEQ's Risk Evaluation Procedures.

(h) **Petroleum Hydrocarbons** - Brownfield Agreement Sites impacted with petroleum compounds must assess the area(s) and media of impact for petroleum hydrocarbon compounds (e.g., benzene, toluene, ethylbenzene, total xylenes, and polynuclear aromatic hydrocarbons). In areas where the concentration of these constituents cannot be determined due to dilution, and/or interference, the Brownfield Applicant may either (1) use the petroleum hydrocarbon methodologies as established in MDEQ's Risk Evaluation Procedures or (2) another TPH risk evaluation methodology approved by MDEQ.

(i) **Land-Use Restrictions** - Before conducting the risk-based evaluation and/or corrective action, if applicable, land-use for the Brownfield Agreement Site shall be proposed by the Applicant, in consultation with MDEQ, as either restricted or unrestricted.

(1) **Unrestricted land-use** - The unrestricted land-use designation is available to property with contaminant concentrations at or below the Tier 1 table concentrations (provided in MDEQ's Risk Evaluation Procedures) for unrestricted land-use.

(2) **Restricted land-use** - Brownfield Property that has contaminant concentrations that exceed the unrestricted contaminant concentration values in the Tier 1 table provided in MDEQ's Risk Evaluation Procedures are classified as restricted. A Brownfield Agreement regarding restricted property must require the creation of a land use restriction referenced in the Brownfield Agreement and in the deed notice, entitled the Notice of Brownfield Agreement Site. The Brownfield Agreement, any required Consent Forms, and the Notice of Brownfield Agreement Site must be filed by the Brownfield Party in the appropriate county courthouse. The Notice of Brownfield Agreement Site must identify the contaminant(s) present at the Site above the Tier 1 table for unrestricted land-use, the media affected, and delineate the vertical and horizontal extent of the contaminant(s) on the Brownfield Property. If the contaminant(s) concentration is at or below the Tier 1 table concentration for restricted land-use, or at or below the site-specific Tier 2 or Tier 3 calculated concentration for restricted land-use, specific restrictions including, but not limited to, property access, property use, or property activities (with an acceptable human exposure duration) shall be stated in the Notice of Brownfield Agreement Site. In addition, the description, location, and maintenance, if applicable, of any engineering controls shall be included in the Notice of Brownfield Agreement Site.

Chapter 4. PUBLIC NOTICE REQUIREMENTS

Section 401. Public Notice Requirements

(a) Public Notice by the MCEQ:

(1) At least forty-five days (45) before the date MCEQ considers the proposed Brownfield Agreement, MDEQ shall publish a public notice in a newspaper of general circulation in the county or counties in which the Brownfield Agreement Site is located. The public notice shall:

i. describe the proposed Brownfield Agreement, including the proposed Brownfield Agreement Site;

ii. request public comment on the proposed agreement within thirty (30) days after the date of publication of the notice; and

iii. provide the date and location of MCEQ's consideration of the proposed Brownfield Agreement.

(2) At the time it forwards the notice for publication, MDEQ shall mail or deliver to the governing authorities of the local governments in which the proposed Site is located, including but not limited to the local zoning authorities, a copy of the public notice.

(3) A copy of the proposed Brownfield Agreement shall be filed for public inspection in the office of the chancery clerk of the county or counties in which the proposed Brownfield Agreement Site is located.

(b) Public Notice by the Applicant

(1) At the time of publication of the public notice under paragraph (a) of this subsection, an Applicant Brownfield Party shall notify by certified mail, return receipt requested, each record surface owner of property contiguous to the Brownfield Agreement Site (at the address contained in the county records, if available) identified by the Brownfield Party after examination of the land records of the county or counties in which the Brownfield Agreement Site is located.

(2) The Brownfield Party shall submit to the MDEQ copies of all letters forwarded to contiguous property owners and copies of the completed return receipts within thirty days after mailing.

(c) Notice of Brownfield Agreement Site

(1) A Brownfield Party entering into a Brownfield Agreement shall submit to MDEQ for its approval a proposed Notice of Brownfield Agreement Site before execution of the Brownfield Agreement as provided in Section 501 of these regulations.

(2) A Notice of-Brownfield Agreement Site:

i. Shall be titled "Notice of Brownfield Agreement Site";

ii. Shall include a survey plat of the Brownfield Agreement Site prepared and certified by a professional land surveyor registered in the State of Mississippi which contains a legal description of the Brownfield Agreement Site and identifies the following:

A. The location and dimensions of the areas of potential environmental contamination with respect to permanently surveyed benchmarks;

B. The type, location, and quantity of contaminants known to exist on or under the Brownfield Agreement Site;

C. All land-use restrictions to be applied to the current or future use of the Brownfield Agreement Site. These land-use restrictions may apply to activities on or under the Brownfield Agreement Site, including, but not limited to, use of groundwater, building, filling, grading, excavating, and mining;

D. All engineering controls included in the Brownfield Agreement; and

E. Names and addresses of all persons who have an interest in the Brownfield Property;

iii. Shall be signed by the Applicant and all persons who have an interest in the Brownfield Agreement Site; and

iv. Shall contain a statement that all parties who have an interest in the Brownfield Agreement Site agree to the land-use restrictions, if applicable.

(d) Public Hearing Regarding Brownfields Agreement

(1) MDEQ may conduct a public hearing on the proposed Brownfield Agreement in the county in which the majority of the proposed Brownfield Agreement Site is located, or in any other location in the local area of the proposed Brownfield Agreement Site that is convenient to the members of the public who may have an interest in the proposed Brownfield Agreement.

(2) MDEQ shall publish a notice of the hearing in a newspaper of general circulation in the county or counties in which the proposed Brownfield Agreement Site is located.

(e) MDEQ shall provide to MCEQ for review before its consideration of the proposed Brownfield Agreement all public comments and the transcript of any public hearing on the proposed Brownfield Agreement.

Chapter 5. DECISION ON BROWNFIELD AGREEMENT

Section 501. Decision on Brownfield Agreement

(a) The approval of a Brownfield Agreement shall be based on a complete application which MDEQ determines to contain all information required under the Act or these regulations. If MCEQ finds that the proposed Brownfield Agreement complies with the Act and these regulations, the MCEQ, by order, shall approve the proposed Brownfield Agreement. After approval of the Brownfield Agreement, the Executive Director and the Brownfield Party shall execute the Brownfield Agreement.

(b) MCEQ may consider an Applicant's financial resources, technical resources, managerial resources and compliance history in determining whether or not to approve a Brownfield Agreement.

(c) Prior to approval of the Brownfield Agreement, MCEQ may require the applicant to demonstrate to the satisfaction of MCEQ that contamination (the source of which is not environmental contamination or activities on or under the Brownfield Property that is the subject of the application but which is contributing or potentially contributing to contamination on or under the Brownfield Property that is the subject of the application) will not migrate onto the Brownfield Property or otherwise compromise the level of remediation of the Brownfield Property required by the Brownfield Agreement. This demonstration may include institutional controls, engineering controls or other preventive measures. In the event information is presented to MCEQ that migration of contamination has occurred or the level of remediation required under the Brownfield Agreement is being compromised, MCEQ may reopen the Brownfield Agreement.

(d) MDEQ shall consider all environmental contamination on or under the Brownfield Property that is the subject of the application to be attributed to activities on or under said Property, unless the Brownfield Applicant can demonstrate to the satisfaction of MDEQ that (1) the source of environmental contamination is off-site and (2) that conditions on or under said Property have not and will not exacerbate or contribute to the contamination. MCEQ may, as it deems appropriate, inspect or require inspections; investigate or require investigations; evaluate or require evaluations; and/or issue orders regarding properties which are a source of contamination on or under the Brownfield Agreement Site.

(e) MCEQ may enter into a Brownfield Agreement as proposed by MDEQ or may modify that agreement before entering into it. MCEQ subsequently may modify any Brownfield Agreement by entry of an order. The MCEQ

orders issued under this Act shall be reviewable as provided in Section 49-17-41.

(f) MCEQ may disapprove a proposed Brownfield Agreement or decline to enter into a Brownfield Agreement by entry of an order. In the order, MCEQ shall state the reasons for disapproval of the agreement or declining to enter into the agreement.

Section 502. Filing of Notice of Brownfield Agreement

(1) Within fifteen (15) days after the Brownfield Agreement is executed, the Brownfield Party shall file a certified copy of the Brownfield Agreement and a Notice of the Brownfield Agreement Site in the office of the chancery clerk of the county in which the Site is located. The chancery clerk shall record and enter the Notice of the Brownfield Agreement Site and the Brownfield Agreement in the land records in accordance with Section 89-5-33 and collect the fees provided in Section 25-7-9. Any subsequent deed or other instrument conveying an interest in Brownfield Property shall state in the deed or instrument that the property is Brownfield Property and subject to a Brownfield Agreement, unless the notice is canceled under Section 801 of these regulations.

(2) If the notice has not been canceled under Section 801 of these regulations, the seller of Brownfield Property shall disclose in the contract for the purchase of the Brownfield Property that the property is Brownfield Property and subject to a Brownfield Agreement.

Section 503. Notice by Brownfield Party of Conveyance of Brownfield Property

Until the Executive Director issues a "no further action" letter under Section 702 of these regulations, the Brownfield Party shall submit written notice to MCEQ at least thirty days prior to any sale, conveyance or other change in surface ownership of any portion of the Brownfield Agreement Site. Approval from MCEQ shall be required for any sale, conveyance or other change in surface ownership of any portion of the Brownfield Agreement Site owned by the Brownfield Party desiring to make the change in ownership, if the new surface owner will be required to or will assume an obligation to perform any obligations under the Brownfield Agreement. In that case, the Brownfield Party and the new surface owner jointly shall provide information satisfactory to MCEQ that the new surface owner has the financial, managerial and technical resources to complete performance of the Brownfield Agreement obligations to be transferred and that the new surface owner agrees to complete this performance. The new surface owner shall also submit a statement to MDEQ on a form prescribed by MDEQ which sets forth the requirements of the Brownfield Agreement for which it accepts responsibility. The Brownfield Party shall remain responsible for the

payment of all reasonable direct and indirect costs of MDEQ associated with administration of the Brownfield Agreement until MDEQ receives a form from the new surface owner by which the new surface owner accepts responsibility for the payment of such costs. If MCEQ determines that the new surface owner has the necessary financial, managerial and technical resources, and an appropriate compliance history, to complete the performance of the Brownfield Agreement and that the new owner has agreed to do so, the MCEQ shall issue an order approving the transfer.

Section 504. Prospective Purchaser Notice

The Brownfield Party shall provide written notice of the Brownfield Agreement Site's status as Brownfield Property to any prospective purchaser of any interest in the Brownfield Agreement Site.

Section 505. Executive Director Authority

Except for orders issued under subsections 501(b), 501(c), and 1002(c) of these regulations, MCEQ, under any conditions it may prescribe, may authorize the Executive Director to issue any orders required under this Act. A decision by the Executive Director shall be a decision of MCEQ and shall be reviewable as provided under Section 49-17-41.

Chapter 6. MODIFICATION OF BROWNFIELD AGREEMENT

Section 601. Conditions for Modifications

(a) A Brownfields Agreement may be modified by order of MCEQ, if:

(1) MCEQ receives new information demonstrating that a contaminant on or under the Brownfield Agreement Site poses less risk than the risk that formed a basis for the remediation requirements. Public notice as designated in Section 401 is required prior to any modification under this subparagraph (a)(1);

(2) The Brownfield Party provides or has provided to MCEQ false information or fails to disclose to MCEQ relevant information about environmental contamination on or under the Brownfield Agreement Site that forms a basis for the Brownfield Agreement or that is offered to demonstrate compliance with the Brownfield Agreement;

(3) New information becomes available after execution of the Brownfield Agreement indicating the existence of previously unknown contaminants or an area of previously unknown environmental contamination that has not been remediated to standards required by applicable federal or state law other than this Act. The Brownfield

Agreement may be amended to include remediation of any previously unknown contaminants and any additional areas in the same Brownfield Agreement Site;

(4) The level of risk to public health or the environment resulting from the Brownfield Agreement Site is increased beyond the level that forms a basis for the risk-based remediation requirements in the Brownfield Agreement due to changes in exposure conditions, including:

i. A change in land-use at the Site or contiguous to the Site that increases the probability of exposure to contaminants on or under the Brownfield Agreement Site or

ii. The failure of remediation to mitigate risks to the extent required to make the Brownfield Agreement Site fully protective of public health and the environment as provided in the Brownfield Agreement; or

iii. The receipt by MDEQ of new information after execution of the Brownfield Agreement about a contaminant on or under the Brownfield Agreement Site that increases the risk to public health or the environment on or under the Brownfield Agreement Site beyond the level that is the basis for the risk-based remediation requirements in the Brownfield Agreement and in a manner or to a degree not anticipated in the Brownfield Agreement;

(b) Minor modifications are not required to comply with the public notice requirements set forth in Section 401. All other modifications are required to go through public notice. Minor modifications include:

(1) Typographical errors;

(2) Equipment replacement or upgrade with functionally equivalent components;

(3) Changes in the frequency of or procedures for monitoring, reporting, sampling or maintenance activities;

(4) Changes in interim compliance dates;

(5) Changes to waste sampling or analysis methods to conform with MDEQ or EPA guidance or regulations;

(6) Changes in name, address, or phone number of contacts;

(7) Changes in groundwater sampling or analysis procedures; or

(8) Such other changes determined by MDEQ not significantly to change or have the reasonable potential significantly to change the Brownfield Agreement.

Chapter 7. LIABILITY PROTECTION AND NO FURTHER ACTION LETTER

Section 701. Liability Protection

(a) Except as provided under Section 701(e) and Section 1002(c) of these regulations, a Brownfield Party who executes a Brownfield Agreement shall be relieved of liability to all persons other than the United States for:

(1) remediation of the Brownfield Agreement Site other than the remediation required by the Brownfield Agreement; and

(2) all costs reasonably related to the remediation other than the remediation and costs required by the Brownfield Agreement or these regulations.

However, these regulations shall not affect the right of any person to seek relief against any party to the Brownfield Agreement who may have liability with respect to a Brownfield Agreement Site, except as provided in this section.

(b) The liability protection provided under and as limited by this section applies to the following persons to the same extent as to a Brownfield Party:

(1) Any person under the direction or control of the Brownfield Party who directs or contracts for remediation or redevelopment of the Brownfield Agreement Site;

(2) Any current owner and any future owner of the Brownfield Agreement Site;

(3) Any person who develops, redevelops or lawfully occupies the Brownfield Agreement Site;

(4) Any successor or assign of any person to whom the liability protection provided under this section applies; and

(5) Any lender or fiduciary that provided financing for remediation or redevelopment of the Brownfield Agreement Site.

(c) A person who conducts an environmental assessment on a Brownfield Agreement Site and who is not otherwise a potentially responsible party shall not become a potentially responsible party as a result of conducting the environmental assessment, unless that person increases the risk of harm to public health or the environment by failing to exercise due diligence and reasonable care in performing the environmental assessment.

(d) The liability protection provided pursuant to this section shall become effective upon execution of a Brownfield Agreement by MCEQ and shall remain effective unless MCEQ removes the liability protection pursuant to Section 1002(c).

(e) A Brownfield Party who satisfactorily completes the remediation required under a Brownfield Agreement, and any other person who receives liability protection under this section, shall not be required to perform additional remediation on or under the Brownfield Agreement Site unless:

(1) The Brownfield Party provides to MCEQ false information or fails to disclose to MCEQ relevant information about environmental contamination on or under the Brownfield Agreement Site that forms a basis for the Brownfield Agreement, that is offered to demonstrate compliance with the Brownfield Agreement;

(2) New information becomes available after execution of the Brownfield Agreement indicating the existence of previously unknown contaminants or an area of previously unknown environmental contamination that has not been remediated to standards required applicable federal or state law other than these regulations. The Brownfield Agreement may be amended to include remediation of any previously unknown contaminants and any additional areas in the same Brownfield Agreement Site;

(3) The level of risk to public health or the environment resulting from the Brownfield Agreement Site is increased beyond the level that forms a basis for the risk-based remediation requirements in the Brownfield Agreement due to changes in exposure conditions, including:

i. A change in land-use at the Site or contiguous to the Site that increases the probability of exposure to contaminants on or under the Brownfield Agreement Site; or

ii. The failure of remediation to mitigate risks to the extent required to make the Brownfield Agreement Site fully protective of public health and the environment as provided in the Brownfield Agreement.

(4) MDEQ receives new information after execution of the Brownfield Agreement about a contaminant on or under the Brownfield Agreement Site that increases the risk to public health or the environment on or under the Brownfield Agreement Site beyond the level that is the basis for the risk-based remediation requirements in the Brownfield Agreement and in a manner or to a degree not anticipated in the Brownfield Agreement; or

(5) A Brownfield Party fails to file a timely and proper Notice of Brownfield Agreement Site under Section 401(c) of these regulations.

Section 702. No Further Action Letter

Upon completion of the Brownfield Agreement, the Brownfield Party may petition MCEQ to determine that the Brownfield Party has completed performance of the Brownfield Agreement. If MCEQ determines after conducting an inspection of the Brownfield Agreement Site that the Brownfield Party has completed the Brownfield Agreement, MCEQ shall issue an order stating MCEQ's conclusion. Following issuance of an order by MCEQ, the Executive Director shall issue a "no further action" letter. The letter shall include the following statement: "Based upon the information provided by [Brownfield Party] concerning property located at [location], it is the opinion of the Commission on Environmental Quality that [Brownfield Party] has successfully and satisfactorily implemented and completed the approved Brownfield Agreement. No further action is required to assure that the remediation required under the Brownfield Agreement is protective of public health and the environment in accordance with the existing and proposed uses of this property."

Chapter 8. CANCELLATION OF NOTICE OF BROWNFIELD AGREEMENT

Section 801. Cancellation

If a Brownfield Party remediates a Brownfield Agreement Site to a risk level of unrestricted use, the Brownfield Party may petition MCEQ to cancel the Notice of Brownfield Agreement Site. If MCEQ issues an order canceling the notice, the current owner of the Brownfield Agreement Site shall file a statement issued by the Executive Director in accordance with MCEQ's order canceling the notice in the office of the chancery clerk in any county in which the Brownfield Agreement Site is located. The Executive Director's statement shall contain the names of the owners of the Brownfield Agreement Site as shown in the Notice of Brownfield Agreement Site and reference the book and page where the notice is recorded. After collecting the proper fee fixed in Section 25-7-9, the chancery clerk shall record the Executive Director's statement as provided in subsection (e) of this section. The chancery clerk shall make a marginal entry on the Notice of Brownfield Agreement Site showing the date of cancellation and the book and

page where the Executive Director's statement is recorded, and the chancery clerk shall sign the entry.

Chapter 9. FEES AND TRUST FUND

Section 901. Fees

(a) The Brownfield Party who submits a Brownfield Agreement application shall pay all reasonable direct and indirect costs of MDEQ associated with the processing of the Brownfield Agreement application and administration of the Brownfield Agreement less the advance costs required in Section 901(b) of this section, unless another funding source (e.g., EPA Cooperative Agreement) is available, acceptable, and approved by MDEQ.

(b) A Brownfield Party who submits a Brownfield Agreement application for review by MDEQ shall pay advance costs of Two Thousand Dollars ($2,000.00) at the time the application is submitted to MDEQ. MDEQ will apply the Two Thousand Dollar ($2,000.00) advance costs to the final invoice as determined by MDEQ.

(c) MCEQ shall set by order a schedule of costs for the processing of the Brownfield Agreement applications and the administration of Brownfield Agreements by MDEQ.

(d) Reasonable direct and indirect costs shall include the cost of MDEQ's utilization of the services of an independent contractor and/or contractual worker to evaluate information associated with the processing of the Brownfield Agreement application and administration of the Brownfield Agreement less the advance costs required in Section 901(b) of this section.

(e) MCEQ may delegate to MDEQ responsibility for the collection of costs in Section 902(a)(1) and (2).

(f) All costs under Section 902(a)(1) shall be due before a date specified by MDEQ, which shall be no less than thirty (30) days following the invoice date. If any part of the costs that are imposed is not paid within thirty (30) days after the due date, a penalty of up to twenty-five percent (25%) of the amount due may be imposed and added to that amount. Any penalty collected under this section shall be deposited into the Brownfields Cleanup and Redevelopment Trust Fund created by Miss. Code Ann. Section 49-35-25(4). If MDEQ pursues legal action to collect costs incurred, reasonable attorney's fees and costs may be assessed against the delinquent party pursuant to Miss. Code Ann. Section 49-35-25(7).

(g) Any person required to pay costs under this section who disagrees with the calculation or applicability of the costs may petition MCEQ for a hearing in accordance with Section 49-17-35.

(h) Costs collected under this section shall not supplant or reduce in any way the general fund appropriation to the MDEQ for the administration of this program, pursuant to Miss. Code Ann. Section 49-35-25(9).

(i) MDEQ shall suspend any activities or actions related to the processing of the Brownfield Agreement application or administration of a Brownfield Agreement, if the Brownfield Party or Parties fails to pay any required costs or penalties imposed under this section. In addition, the MCEQ shall issue an order in accordance with Section 1002(b) requiring the Brownfield Party to pay the required costs within a certain time. Failure to comply with the order may subject the Brownfield Party to remedies set forth Mississippi Code Annotated Section 49-17-43 and removal of liability protection set forth in Section 701.

(j) MDEQ shall submit a final invoice to the Brownfield Party within sixty (60) days of the issuance of a “No Further Action Letter” for Sites that do not require post-closure activities or compliance monitoring. For those Sites that require post-closure activities or compliance monitoring, MDEQ and the Brownfield Party shall agree upon reasonable direct and indirect costs associated with the administration of post-closure activities or compliance monitoring as outlined in the Brownfield Agreement.

(k) Nothing in this section affects any existing program at MDEQ or affects any authority of MCEQ or MDEQ to take any action authorized by law.

Section 902. Brownfields Cleanup and Redevelopment Trust Fund

(a) Pursuant to Miss. Code Ann. Section 49-35-25(4), there is created in the State Treasury a fund to be designated as the "Brownfields Cleanup and Redevelopment Trust Fund," referred to in this section as "fund," to be administered by the Executive Director.

(b) Monies in the fund shall be utilized to pay reasonable direct and indirect costs associated with the processing of the Brownfield Agreement applications and the administration of Brownfield Agreements.

(c) Expenditures may be made from the fund upon requisition by the Executive Director.

(d) The fund shall be treated as a special trust fund. Interest earned on the principal shall be credited by the Treasurer to the fund.

(e) The fund may receive monies from any available public or private source, including, but not limited to, collection of costs, interest, grants, taxes, public and private donations, judicial actions and appropriated funds.

(f) Monies in the fund at the end of the fiscal year shall be retained in the fund for use in the next succeeding fiscal year.

(g) All monies collected under this section shall be deposited into the fund.

Chapter 10. HEARINGS AND ENFORCEMENT

Section 1001. Hearings

Any person or interested party aggrieved by any order of MCEQ pursuant to the Act or these regulations may file a request for hearing or notice of appeal pursuant to Miss. Code Ann. Section 49-17-41. Any person who disagrees with any other action of MCEQ pursuant to the Act or these regulations may file a petition with MCEQ for a hearing pursuant to Miss. Code Ann. Section 49-17-35.

Section 1002. Enforcement and Agency Reporting

(a) Any material failure of a Brownfield Party or the agents or employees of a Brownfield Party to comply with the Brownfield Agreement constitutes a violation of this section by the Brownfield Party. If a Brownfield Party violates this section, MCEQ may issue an order requiring the Brownfield Party to correct the violation in an appropriate time period established by the order.

(b) If the Brownfield Party fails to comply with an order issued under Section 1002(b) or provides false information to MCEQ or MDEQ during the application process or in reports required by the Brownfield Agreement or by state or federal law, MCEQ may remove the liability protection afforded by the Brownfield Agreement under Section 701, require additional remediation, and/or assess civil penalties pursuant to Miss. Code Ann. Section 49-17-43.

(c) This section shall not create a defense against the imposition of criminal or civil penalties or other administrative remedies authorized by law for violations of law caused by the Brownfield Party while implementing or failing to implement the Brownfield Agreement.

(d) Any land-use restriction or engineering control in a Brownfield Agreement and in a Notice of Brownfield Agreement Site filed under this section may be enforced by MCEQ by initiating an administrative proceeding or by filing a civil action without first having exhausted all available administrative remedies.

(e) A land-use restriction or engineering control shall not be declared unenforceable due to lack of privity of estate or contract, due to lack of benefit to particular land, or due to lack of any property interest in particular Brownfield Property within the Brownfield Agreement Site. Any person who owns or leases Brownfield Property within the Brownfield Agreement Site subject to a land-use restriction or engineering control under this section shall abide by the land-use restriction or engineering control.

(f) MCEQ may terminate a Brownfield Agreement by order issued pursuant to Section 1002(c). The order shall direct the executive director to issue a notice of cancellation of Brownfield Agreement. Any order to terminate shall provide that all liability protection provided by the Brownfield Agreement has been removed. The statement issued by the executive director shall direct the chancery clerk to make a marginal entry of termination on the Notice of Brownfield Agreement Site and the Brownfield Agreement. In the event a Brownfield Agreement is terminated, the Brownfield Party shall be responsible for notifying the following parties of the termination:

(1) All owners of interest in the Brownfield Agreement Site;

(2) All persons who own property contiguous to the Brownfield Agreement Site;

(3) All local governments that were originally notified of the Brownfield Agreement;

(g) Additionally, upon termination the Brownfield Party shall:

(1) Publish a notice of cancellation in a local newspaper;

(2) Record all instruments of cancellation in the office of the chancery clerk in each county in which the Brownfield Agreement Site is located;

(3) Pay all costs for the foregoing; and

(4) Forward to MDEQ documentation evidencing the accomplishment of the foregoing.

SUBPART II

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

RISK EVALUATION PROCEDURES FOR

VOLUNTARY CLEANUP AND REDEVELOPMENT OF

BROWNFIELD SITES

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

SUBPART II. RISK EVALUATION PROCEDURES

Chapter 1. GENERAL

Section 101. Introduction

(a) The Mississippi Brownfields Voluntary Cleanup and Redevelopment Program (Brownfields Program) utilizes risk-based criteria for Site evaluation and remediation. The risk-based procedures and rationale for evaluating environmental contamination on or under a Site are presented in this Subpart II. This evaluation is necessary to develop remediation requirements that are protective of human health and the environment. All remediation and/or corrective actions must be approved by MDEQ.

(b) In considering the risk-based evaluation of conditions on or under a Site, the following must be addressed:

(1) complete the Site Conceptual Exposure Model (SCEM) to evaluate site-specific risk and exposure conditions before and after remediation;

(2) conduct a Site Characterization to delineate the nature and extent (vertically and horizontally) of contamination found on or under the Site;

(3) complete the Site Ecological Checklist to determine whether an ecological risk assessment is necessary; and

(4) conduct a Risk-Based Evaluation of the Site utilizing the Brownfields Program three-tiered approach.

(c) The cornerstone of the Brownfields Program is a three-tiered risk-based process for evaluating human health and environmental risks. These tiers are referred to as Tier 1, Tier 2, and Tier 3. These tiers are designed to allow the Applicant to evaluate and determine appropriate remedial options for site specific conditions. A description of each tier is discussed below.

(1) A Tier 1 Evaluation is the comparison of site-specific data to a "look-up" table of chemical-specific target remediation goals (TRGs). Specific TRG concentrations have been determined to be protective of human health and the environment for restricted use and unrestricted use of a Site. The Tier 1 TRG Table is presented in Appendix A.

(2) A Tier 2 Evaluation provides the Applicant the option of performing a more in-depth evaluation of site-specific conditions to develop site-specific Remediation Goals (RG) and/or to better define site-specific data to be used for a Tier 1 Evaluation.

(3) A Tier 3 Evaluation is a site-specific risk assessment to evaluate the potential human health and ecological risks at the Site that will result in the development of site-specific Remediation Goals (RGs).

(d) Land use plays an integral role in the three-tiered approach and in the development of the SCEM. Land-use restrictions may reduce or eliminate the potential for exposure to contaminants and risk.

(e) Specific criteria for evaluating Sites impacted with petroleum hydrocarbons is contained in Chapter 7 of this Subpart II.

Chapter 2. BROWNFIELD SITE EVALUATION

Section 201. Site Conceptual Exposure Model (SCEM)

(a) The SCEM is a graphical representation of actual and potential Site conditions based on available data and an understanding of those Site conditions. A BASELINE and a REMEDIAL SCEM must be completed and are provided in forms prescribed by MDEQ. The BASELINE SCEM represents the risk and exposure conditions that exist prior to the implementation of remediation. The REMEDIAL SCEM represents the risk and exposure conditions that exist or are expected to exist after the implementation of remediation. Items to be identified in the SCEM include the following:

(1) chemical of concern (CoC) sources;
(2) CoC movement (migration/transport);
(3) the actual or potential exposure pathways; and
(4) the actual or potential receptor populations.

(b) Based on the results of the completed BASELINE SCEM, exposure point concentrations (EPCs) must be identified for CoC(s) with completed and potentially completed exposure pathways. EPCs are the concentrations of site-related compounds in a specific media that a human or environmental receptor will contact (Complete) or may potentially contact (Potentially Complete) through ingestion or inhalation at the point of exposure.

(c) All four elements identified in the SCEM must be complete for exposure to occur. It is important to note that the BASELINE SCEM should be developed early in the process (i.e., Brownfield Application and/or work plan stage) and identified as "draft" if additional information is pending. The BASELINE SCEM can be updated and modified as the site investigation progresses and more site-specific information becomes available. BASELINE SCEM should be identified as "final" once the Site Characterization is complete.

(d) If additional issues of concern pertaining to exposure at the site (additional pathways, media, sources, transport mechanisms, receptors, etc.) are not

specifically addressed in the SCEMs, the Applicant should provide an attachment(s) to the appropriate SCEM discussing the additional issues.

(e) The BASELINE and REMEDIAL SCEM worksheets must be included as part of the Site Characterization Report and the Corrective Action Report.

(f) The procedures for completing the SCEMs follow:

(1) Identify the Primary Sources (on-site and off-site) of contamination that exist or are believed to have existed.
(2) Identify the Secondary Sources. Mark the media (soils, groundwater, sediments, or surface water) that have been impacted (Complete) or could potentially be impacted (Potentially Complete) by a release from a primary source.
(3) Identify the Transport Mechanisms by which the contaminants may move through the environment.
(4) Identify the Exposure Pathway that is the medium (soil, groundwater, air, sediments, or surface water) that a receptor will contact (Complete) or may contact (Potentially Complete).
(5) Identify the Actual (Complete) and the Future (Potentially Complete) Receptors for restricted and unrestricted land-use.

Section 202. Criteria For Completing The SCEMs

(a) **BASELINE SCEM** - The following sections describe the criteria for evaluating the completeness and potential completeness of contaminant exposure for the Site. All potential exposure pathways should be evaluated for completeness, as identified in the SCEM worksheets. The Applicant should provide as much detail as possible. Indicate all sources, transport mechanisms, pathways and receptors that are complete or potentially complete. If information is not available to support a pathway as incomplete then that pathway should be considered to be potentially complete and should be identified for evaluation until such information becomes available. A description of each of the BASELINE SCEM criteria is provided in the following sections.

(1) **Sources** can be defined as either Primary Sources or Secondary Sources. Primary Sources are those present or past storage units (i.e., tanks, impoundments, piles), distribution systems (i.e., piping, manifolds, lines, pumps), operations (i.e., wash areas, repair bays, water treatment, blending tanks, formulation areas), waste management units (i.e., burn pits, disposal units, dumps) and other on-site and off-site sources of actual or potential contamination that have or may have leaked, leached, spilled, or otherwise been released and may have impacted the Site. Several categories of potential primary sources are included on the SCEM worksheet and can be identified by filling in the appropriate boxes on the worksheet. If the sources

listed do not pertain to the Site, then use "Other". The Applicant should be as specific as possible about the source of contamination. Supporting documentation (i.e., analytical results, product storage/transmission information, tank information, etc.) of the primary source of contamination should be provided in the appropriate section(s) of the Work Plan and/or Site Characterization Report.

Secondary Sources are defined as transport media (i.e., surficial soils, subsurface soils, groundwater, sediments, or surface water) that have been impacted or potentially impacted by the primary (release) source. Identify all media that may serve as secondary sources of contamination. For the purposes of this Subpart II, surficial soil is defined as extending to 6 ft. below ground surface (bgs). The presence of CoCs that cannot be attributed to background should be identified as "complete," and any secondary source that is potentially affected by an on-site or off-site primary source should be identified as "potentially complete." The Applicant must provide adequate documentation to demonstrate that a secondary source has not been affected in order to remove that medium from further consideration. If such documentation has not yet been gathered to support the exclusion of a secondary source, then that medium must be identified as "potentially complete" until such time as such information becomes available. The BASELINE SCEM can be updated as additional site-specific data are gathered.

(2) **Transport Mechanisms** are means by which the CoC release can migrate from the identified secondary sources and result in actual or potential human exposure. A variety of potential transport mechanisms are generally applicable to a site. Indicate on the BASELINE SCEM Worksheet those transport mechanisms that are applicable or potentially applicable to the site. Those transport mechanisms identified as applicable or potentially applicable should be marked "complete" or "potentially complete," respectively.

i. **Surficial Soils** - If surficial soil has been identified as a secondary source, then the following transport mechanisms must be identified as "complete" or "potentially complete":
   (A) Wind Erosion and Atmospheric Dispersion (For Non-Volatile Compounds Only)
   (B) Volatilization and Atmospheric Dispersion (For Volatile Compounds Only)
   (C) Volatilization and Enclosed-Space Accumulation (For Volatile Compounds Only)
   (D) Leaching and Groundwater Transport

Note: The Soil Exposure Pathway must also be identified as "complete" or "potentially complete" if surficial soil has been identified as a secondary source.

ii. **Subsurface Soils** - If subsurface soil has been identified as a secondary source, then the following transport mechanisms must be identified as "complete" or "potentially complete":
(A) Volatilization and Enclosed-Space Accumulation (For Volatile Compounds Only)
(B) Leaching and Groundwater Transport

iii. **Groundwater** - If groundwater has been identified as a secondary source, then the following transport mechanisms must be identified as "complete" or "potentially complete":
(A) Volatilization and Enclosed-Space Accumulation (For Volatile Compounds Only)
(B) Leaching and Groundwater Transport

iv. **Sediments or Surface Water** - If sediment or surface water has been identified as a secondary source, then Surface Water Runoff or Surface Water Transport must be identified as "complete" or "potentially complete."

(3) **Exposure Pathways** are the processes by which human uptake or exposure to site-related compounds may occur. Identify all "complete" or "potentially complete" exposure pathways at the Site that may provide a means for human exposure. All exposure pathways should be identified as potentially complete if supporting information for the exclusion of the pathway is not currently available.

i. **Soil** - If surficial soils are affected, then direct exposure through incidental ingestion must be indicated as complete or potentially complete. Contamination in surface and subsurface soils may be available for exposure through direct contact during intrusive activities, such as construction. The future use of the site and any plans for construction should be considered when evaluating the completeness of direct contact to subsurface soils.

ii. **Air** - Contamination of surface soil provides the potential for human uptake or exposure through inhalation of vapor from volatile compounds and through inhalation of non-volatile compounds that have adsorbed to surface soil particulates. Contamination of subsurface soil provides the potential for human uptake or exposure through inhalation of vapor from volatile compounds (i.e., migration into basements or during intrusive activities such as construction) and through inhalation of non-volatile compounds that have adsorbed to subsurface soil particulates during

intrusive activities, such as construction. In addition, the presence of volatile compounds in groundwater at the site produces the potential for volatilization into air (i.e., migration into basements, depth to groundwater is less than six (6) feet or intrusive activities).

iii. **Groundwater** - Contamination of groundwater requires that the Groundwater Exposure Pathway be marked as "complete" in the BASELINE SCEM. Surface and subsurface soils capable of leaching into groundwater at levels above the Groundwater TRG require that the Groundwater Exposure Pathway be marked as "complete" in the BASELINE SCEM. The presence of CoCs in surface and subsurface soils requires that the Groundwater Exposure Pathway be marked as "potentially complete" in the BASELINE SCEM. The Applicant must provide adequate documentation to demonstrate that CoCs in surface and subsurface soils will not leach into groundwater in order to remove that medium from further consideration. If documentation has not been gathered to support the exclusion of exposure pathway, that pathway must be identified as "potentially complete." The BASELINE SCEM can be updated as additional site-specific data are gathered.

iv. **Surface Water** - The exposure pathways applicable to surface water are included in the SCEM Worksheet in order to protect surface water bodies that may be used for domestic or recreational purposes. The presence of site-related compounds in soils, sediments, surface water, or groundwater provides the potential for migration or discharge to either on-site or off-site surface water bodies that may be used for recreational purposes, for a potable water supply, or for livestock watering. If contaminants are present in onsite media and such a surface water body is present within 500 ft. of the Site boundary, the pathway should indicate "potentially complete." Provide documentation in the Work Plan and/or the Site Characterization Report that a water body is not associated with or affected by the Site.

(4) The identification of **Potential Receptor** populations at the site is an important part of the completion of the BASELINE SCEM. It is important to know as much about the current and potential future use of the site and receptor populations, as possible. The receptor populations and the planned future use of the site are integral in supporting the remedial options at the site. Any and all potential receptor populations that could be exposed to site-related compounds should be identified on the BASELINE SCEM.

(b) **REMEDIAL SCEM** - Once the BASELINE SCEM has been completed, remedial options (i.e., institutional controls, engineering controls, or active cleanup) for the Site that can "shut off" or eliminate exposure to contamination should be evaluated. Those complete and potentially complete exposure routes linking sources to receptor populations must be remediated using one or a combination of options.

Free product must be remediated in a manner consistent with Section 601(d)(4) of this Subpart II. The REMEDIAL SCEM includes shut-off valves to graphically depict "open" or "closed" pathways between contaminated media and the receptor population. Shut-off valves are marked (shut) to indicate the remedial action that has been taken or proposed for the Site. A description of the types of remedial actions follow:

(1) **Institutional Controls** - The use of institutional controls (land use restrictions and agreed order with MDEQ) can serve as barriers in preventing future contact with subsurface soils and groundwater. Site land-use may be "unrestricted" or "restricted" that relates generally to residential and industrial/commercial, respectively. The potential to restrict the future use of the site (example: use of the site to a defined industrial use only, or the limitations of future construction activities, prohibiting groundwater use) can be considered in the remediation of the Site. If no restrictions for future use will be placed on the property by the Applicant, the identified remediation goals will be based on the future unrestricted (residential) use of the Site. Documentation of the institutional controls must be provided to support the proposed site remediation. A land use restriction and agreed order with MDEQ shall be used for "restricting" the Site. Institutional controls are to be used to "shut off" exposure to contamination. The Site Characterization Report and/or Corrective Action Plan must document the appropriate restrictions to be implemented. The Institutional Control Shut-off Valve on the REMEDIAL SCEM should be marked to reflect this option. An institutional control by itself cannot be used if there is further migration and/or expansion of the contamination.

(2) **Engineering Controls** - The use of engineering controls can reduce or eliminate the potential for exposure to contaminants through containment. Engineering Controls may include, but are not limited to, physical or hydraulic control measures (such as groundwater recovery trenches and leachate collection systems), groundwater treatment systems, engineered caps, liner systems, slurry walls or permanent structures, but shall not include the exclusive use of security fencing. Ingestion and dermal contact of soil contamination that exists under a building may be considered "shut off" provided the institutional control restricts the removal of the slab, thus eliminating the future potentially complete exposure route to soil contamination via ingestion or dermal contact. If an engineering control is used to "shut-off" exposure to contamination, the Site Characterization Report and/or Corrective Action Plan must document the appropriate engineering control and/or institutional control to be implemented. The Engineering Control Shut-off Valve on the REMEDIAL SCEM should be marked to reflect this option. An institutional control must be coupled with the engineering control to ensure the engineering control is maintained until the site is remediated to an unrestricted level.

(3) **Active Cleanup** - The active cleanup (i.e., removal, treatment) of contamination to levels that are protective of human health and the environment can reduce or eliminate the potential for exposure to contaminants. If active cleanup is used to "shut off" exposure to contamination, the Site Characterization Report and/or Corrective Action Plan must document the active cleanup activities and/or institutional control to be implemented. The Active Cleanup Shut-off Valve on the REMEDIAL SCEM should be marked to reflect this option. An institutional control may be necessary, depending upon the projected length of the cleanup, particularly if groundwater has been impacted (e.g., pump and treat system has been installed and projected to continue for 30 years).

Section 203. Site Characterization

(a) A Site Characterization must be conducted to delineate the nature and extent (vertically and horizontally) of contamination on and under the Site. Site characterization data should be collected and presented in accordance with the Quality Assurance Project Plan (QAPP) and Site Characterization Report formats. In general, the Applicant must demonstrate that the data are representative of the actual and/or potential contamination conditions at the Site. Collected data must include information describing and delineating the contaminant source area. Information pertaining to the characteristics of the CoCs, including the chemical and physical properties as well as the potential of the CoCs to migrate and transport to receptor locations through or in the affected media, must also be provided.

(b) The degree of contamination in surface and subsurface soil should be determined by performing soil boring(s) down to the depth of groundwater in the saturated zone. Surface soil is defined as the soil located at the surface and extending to a depth of six (6) feet below the ground surface. The subsurface soil depth is any depth beyond six feet. The Applicant must address ingestion, potential dermal contact, and inhalation (through volatilization and particulates) of hazardous chemicals present in the surface soil. In addition, CoCs in the surface soil may be transported off-site through precipitation runoff.

(c) The Applicant must demonstrate that groundwater is not impacted by the site-related contaminant; or that if groundwater is impacted, the impacted groundwater is confined and will remain confined within the Site. Groundwater contaminant concentrations should be determined by collecting groundwater samples.

(d) Measured data are those data collected from temporary or permanent (monitoring) wells. The Applicant should install wells, as necessary, to delineate the vertical and horizontal extent of groundwater impact and to determine flow direction and groundwater quality. Wells must be installed, developed, purged, and sampled in a manner consistent with EPA Region IV, Science and Ecological Support Division, Environmental Investigations Standard Operating Procedures and Quality

Assurance Manual, May 1996, as amended, or other procedures approved by MDEQ. Measured groundwater data must be based on unfiltered groundwater samples.

(e) The site characterization data should be collected in accordance with data quality objectives (DQOs) stipulated in the QAPP. The DQOs shall, at a minimum, identify the number of field and quality control samples, quantitation limits, analytical methods, and sample collection, preservation, and handling methods. Matrix interferences shall be minimized to the extent feasible by modified sample extraction and preparation methods in accordance with EPA or MDEQ approved analytical methodologies.

(f) The data collection strategy should be based on the Site Conceptual Exposure Model (SCEM) that hypothesizes or describes how the source chemicals or CoCs are released, transported, and exposed to the receptors.

(g) The Applicant must demonstrate that the analytical laboratory data have been reviewed for compliance with the DQOs. In the Site Characterization Report, the Applicant shall identify data that meet DQOs.

(h) To establish background chemical concentrations, the Applicant may collect samples from locations, as approved by MDEQ, outside of the influence of known contaminated areas and regionally prevalent chemicals and must analyze these samples using the same analytical methods as the CoC analyses.

(i) To establish regionally prevalent chemical concentrations, the Applicant may collect samples from locations, as approved by MDEQ, throughout a substantial geographic region and outside the influence of known contaminated areas and must analyze these samples using the same analytical methods as the CoC analyses.

(j) Historical data approved by MDEQ may be submitted in lieu of collecting new data provided that: (1) the Site characterization data requirements are summarized and presented in accordance with the Quality Assurance Project Plan and Site Characterization Report Formats; and (2) the data was collected in a manner consistent with appropriate sampling protocols, as approved by MDEQ. All detailed information must be referenced in the reports including sampling protocols. In any event, relevant previous site characterization reports should be submitted along with the application. Deviations from the required methodologies in the Quality Assurance Project Plan, Site Characterization Report, or Corrective Action Plan formats must be presented to and approved by MDEQ.

Section 204. Site Ecological Checklist

The Ecological Checklist is used to determined if ecological receptors of concern are present and potentially impacted (See Appendix D). If such receptors are present, MDEQ will make a determination as to whether a Tier 3 assessment of ecological risk should be performed to assess the potential ecological impact. Tier 1 and Tier 2 Evaluations are applicable for Sites with no known ecological receptors of concern.

Chapter 3. TIER 1 EVALUATION

Section 301. Tier 1 Evaluation Target Risk Level

The TRGs presented in the Tier 1 TRG table, Appendix A, are based on either (1) a $1x10^{-6}$ target risk level for each carcinogenic chemical, (2) a hazard index not to exceed 1 for each systemic toxicant, or (3) constituent TRG concentrations established through federal/state programs (i.e., Safe Drinking Water Act). The values presented in the Tier 1 TRG table will be modified periodically based on EPA updates of toxicity values obtained from the sources presented in Section 502(c)(2) of this Subpart II.

Section 302. Tier 1 Evaluation Procedures

(a) The basic methodology for a Tier 1 Evaluation shall be the comparison of the highest concentration of each contaminant in each media to the TRGs provided in the Tier 1 TRG table. Results of the comparison will be used to determine if the site specific data are:

(1) at or below the unrestricted risk value;
(2) above the unrestricted risk value, but at or below the restricted risk value; or
(3) above the restricted risk value.

(b) Sites that do not require an ecological evaluation beyond the Site Ecological Checklist and that exhibit chemical concentrations that are at or below the unrestricted TRGs do not require further evaluation or action. Such sites are not eligible for the Brownfields Program since remediation is not necessary as required in Section 49-5-5(b) of Mississippi Code Annotated, as amended.

(c) Sites with chemical concentrations in soils that are greater than the unrestricted TRGs but below the restricted TRGs may:

(1) clean-up and/or remove the affected media to a value at or below the unrestricted TRG values resulting in an unrestricted land-use site;
(2) implement appropriate institutional controls (i.e., land use restriction and agreed order with MDEQ) resulting in a restricted land use site; or
(3) perform a Tier 2 Evaluation.

(d) Sites with chemical concentrations in soils that exceed the restricted TRGs may:

(1) clean-up and/or remove the affected media to a value at or below the unrestricted TRG values resulting in an unrestricted land use site;
(2) clean-up and/or remove the affected media to a value at or below the restricted TRG values but above the unrestricted TRG values resulting in a restricted land use site and implement appropriate institutional controls (i.e., land use restriction and agreed order with MDEQ); or
(3) perform a Tier 2 Evaluation.

(e) Sites with chemical concentrations in groundwater that are greater than the unrestricted TRGs may:

(1) clean-up the affected media to a value at or below the unrestricted TRG values resulting in an unrestricted land-use site;
(2) implement appropriate institutional controls (i.e., land use restriction and agreed order with MDEQ) resulting in a restricted land use site; or
(3) perform a Tier 2 Evaluation.

(f) MDEQ may consider utilizing the Method Detection Limit (MDL) in place of the Target Remediation Goal (TRG) on a case by case basis.

(g) In areas of a site where chemical concentrations of petroleum hydrocarbon indicator compounds (e.g., BTEX, PAHs, MTBE) are not quantifiable to the Tier 1 TRGs (e.g., dilution and/or matrix interference) may:

(1) use the Tier 1 TRGs for TPH-GRO/DRO for performing a Tier 1 Evaluation; or
(2) perform a Tier 2 TPH Fractioning Evaluation.

Chapter 4. TIER 2 EVALUATION

Section 401. Tier 2 Evaluation Target Risk Level

For human health, the remediation goal (RG) for each individual contaminant which is (1) a carcinogen must be calculated to attain a Risk Level of 10^{-6} (i.e.,1 in a million) and (2) a systemic toxicant must be calculated to attain a total hazard quotient of not more than 1 except with regard to a background chemical concentration or a regionally prevalent chemical concentration. In cases where contaminants with corrective action concentrations established through federal and/or state programs (i.e., Safe Drinking Water Act maximum contaminant levels (MCLs)) are present, the MDEQ will determine the appropriate corrective action concentration on a contaminant by contaminant basis. In no event, except with regard to a background chemical concentration, may either (1) the cumulative (total) site carcinogenic risk exceed 1×10^{-4} for carcinogenic CoCs or (2) the site hazard index (summation of hazard quotients) exceed 3 for non-carcinogenic CoCs

affecting the same organ or organ system without the use of both an engineering control and an institutional control.

Section 402. Tier 2 Evaluation Options

(a) Tier 2 Evaluation is a more in-depth evaluation of site-specific conditions beyond the Tier 1 Evaluation methodology. The Tier 2 Evaluation may include, but is not limited to, an evaluation of site-specific conditions by (1) determining the Upper Confidence Limit (UCL) of the Mean for a CoC utilizing statistical methods and comparing the UCL to the Tier 1 TRGs, (2) comparing EPCs to calculated background chemical concentrations, (3) comparing EPCs to calculated regionally prevalent chemical concentrations, (4) utilizing site-specific variables (i.e., exposure frequency, exposure duration, etc.) to calculate site-specific RGs, (5) eliminating or minimizing exposure to contaminants, (6) conducting an analysis of Petroleum Hydrocarbons using TPH Fractioning, or (7) utilizing other methods approved by MDEQ.

(1) **Statistical Methods** - If the Applicant can demonstrate to the satisfaction of MDEQ that the UCL of the Mean for a CoC utilizing statistical methods is less than the Tier 1 TRG for that CoC, this calculated value may be used instead of the highest CoC concentration. The UCL of the Mean is then compared to the Tier 1 TRG to evaluate remedial options. The Applicant must demonstrate to the satisfaction of MDEQ that the data are statistically normal or can be statistically normalized.

i. The methodology used to determine the UCL of the Mean should be conducted in accordance with the EPA's Supplemental Guidance to RAGS: Calculating the Concentration Term (EPA, 1992a), or another method approved by MDEQ.

(2) **Site Background** - CoC concentrations may be compared to site background chemical concentrations to evaluate appropriate remedial actions at the Site.

i. To establish background chemical concentrations, the Brownfield Applicant may collect samples from locations outside of the influence of known contaminated areas and regionally prevalent chemicals (both vertically and horizontally), as approved by MDEQ and must analyze these samples using the same analytical methods as the CoC analyses.

ii. If the Applicant can establish that the background chemical concentration of a CoC is higher than the Tier 1 TRG concentration for that CoC listed in Appendix A, the Applicant shall have the option of using the background chemical concentration as the Remedial Goal (RG).

iii. Remediation of a CoC above its established background chemical concentration will not be necessary.

iv. The methodology used to determine background chemical concentrations in soil shall be conducted in accordance with EPA's Engineering Forum Issue: Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites (EPA/540/S-96/500), December 1995, or another method approved by MDEQ.

v. The methodology used to determine background chemical concentrations in groundwater shall be conducted in accordance with EPA's Guidance Document on the Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities (EPA/530/SW-89/026), April 1989, or another method approved by MDEQ.

(3) **Regionally Prevalent Chemicals** - CoC concentrations may be compared to regionally prevalent chemical concentrations to evaluate appropriate remedial actions at the Site.

i. To establish regionally prevalent chemical concentrations, the Brownfield Applicant may collect samples from locations throughout a substantial geographic region and outside the influence of known contaminated areas, as approved by MDEQ, and must analyze these samples using the same analytical methods as the CoC analyses.

ii. If the Applicant can establish that the concentration of a CoC is higher than the concentration of a regionally prevalent chemical, the Applicant shall have the option of using the concentration of the regionally prevalent chemical as the Remedial Goal (RG) provided (1) the cumulative (total) site carcinogenic risk does not exceed 1×10^{-4} for all on-site carcinogenic CoCs and (2) the site hazard index (summation of hazard quotients) does not exceed 3 for all on-site non-carcinogenic CoCs that affect the same organ or organ system.

iii. The methodology used to determine regionally prevalent chemical concentrations in soil shall be conducted in accordance with EPA's Engineering Forum Issue: Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites (EPA/540/S-96/500), December 1995, or another method approved by MDEQ.

iv. The methodology used to determine regionally prevalent chemical concentrations in groundwater shall be conducted in accordance with EPA's Guidance Document on the Statistical Analysis of Ground-Water

Monitoring Data at RCRA Facilities (EPA/530/SW-89/026), April 1989, or another method approved by MDEQ.

(4) **Site-Specific Variables** - If the Applicant can demonstrate to the satisfaction of MDEQ that site-specific variables (i.e., exposure duration, exposure frequency, moisture content, etc.) are more representative of site conditions than the default variables utilized in the development of the Tier 1 TRGs, the Applicant may modify site-specific variables in the risk calculation to develop RGs for the CoCs. Chemical-specific values (i.e., Henry's law constant, diffusivity in water, etc.) must be taken from EPA's Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128), May 1996, unless otherwise approved by MDEQ. The Applicant shall not adjust the following variables in the development of site-specific RGs in Tier 2:

i. Oral cancer slope factor;
ii. Inhalation cancer slope factor;
iii. Oral chronic reference dose;
iv. Inhalation chronic reference dose;
v. Target excess individual lifetime cancer risk;
vi. Target hazard index;
vii. Body weight, adult; or
viii. Body weight, child.

(5) **Eliminate/Minimize Exposure Routes** - If the Applicant can demonstrate to the satisfaction of MDEQ that land-use restrictions and engineering controls at the site will eliminate all complete exposure pathways or will minimize contamination exposure to levels that will be protective of human health and the environment, MDEQ may determine that further remediation is not required. The Commission considers the presence of free product to be an unacceptable potential risk to public health and the environment because it is considered to be a continuing source of contamination that may increase the level of risk that is the basis for the remediation requirements, may reduce the margin of safety provided by the remediation design, or may jeopardize the permanence of the Brownfield Agreement. Therefore, free product must be removed unless it can be demonstrated to the satisfaction of MDEQ that removal of the free product is technically impracticable. The Applicant must also demonstrate to the satisfaction of MDEQ that the contamination is confined and will remain confined within the site boundaries. Any monitoring plan must be approved by MDEQ.

(6) **TPH Fractioning** - In areas where concentrations of Tier 1 petroleum hydrocarbon indicator compounds are not quantifiable to the Tier 1 TRGs and where the concentrations of TPH exceed the Tier 1 TRG for TPH-GRO/DRO, the Brownfield Applicant may either (1) conduct a more detailed evaluation of petroleum hydrocarbons using the methodology outlined in Chapter 7 of this

Subpart II or (2) conduct an evaluation of TPH utilizing another methodology approved by MDEQ.

(7) **Other Approved Methods** - MDEQ may approve other risk evaluation methodologies or combinations thereof under Tier 2.

(b) MDEQ may consider utilizing the Method Detection Limit (MDL) as the site-specific Remediation Goal (RG) on a case by case basis.

(c) References for any fate and transport models used for the exposure point calculations (EPA-approved model or models that have been peer reviewed by experts in the modeling field) and all input values and assumptions for the models must be provided to and approved by MDEQ.

Chapter 5. TIER 3 EVALUATION

Section 501. Tier 3 Evaluation Target Risk Level

(a) **Human Health**

(1) The remediation goal (RG) for each individual contaminant which is a carcinogen must be calculated to attain a Risk Level of 10^{-6} (i.e.,1 in a million) or which is a systemic toxicant must be calculated to attain a total hazard quotient of not more than 1, except with regard to a background chemical concentration or a regionally prevalent chemical concentration. In cases where contaminants with corrective action concentrations established through federal and/or state programs (i.e., Safe Drinking Water Act maximum contaminant levels (MCLs)) are present, the MDEQ will determine the appropriate corrective action concentration on a contaminant by contaminant basis. In no event, except with regard to a background chemical concentration, may either (1) the cumulative (total) site carcinogenic risk exceed 1×10^{-4} for carcinogenic CoCs or (2) the site hazard index (summation of hazard quotients) exceed 3 for non-carcinogenic CoCs affecting the same organ or organ system.

(2) The MDEQ may consider an alternative quantitative or qualitative remediation goal (RG) for each individual contaminant, provided the Applicant can demonstrate to the satisfaction of MDEQ that the attainment of (1) a Risk Level of 10^{-6} for each individual carcinogenic contaminant or (2) a total hazard quotient of not more than 1 for each individual systemic toxicant is technically impracticable, except with regard to a background chemical concentration or a regionally prevalent chemical concentration.

(3) The Site risk levels shall be based on high-end exposure (use of high-end values for the exposure point concentration and exposure duration parameters) in the intake calculation of a deterministic risk assessment or 90th percentile of the risk presented in the probabilistic risk assessment. The Site hazard indices

and/or quotients shall be based on high-end exposure in a deterministic risk assessment or 90th percentile of the exposure presented in the probabilistic risk assessment.

(b) **Ecological**

(1) For a Tier 3 Ecological Evaluation, one of the following must be satisfied:

i. High-end CoC concentrations in the impacted media must be below their respective threshold concentrations or regulatory values that are protective of the ecological receptors of concern or the valued resources to be protected;
ii. Findings from a field survey indicate that there is no readily apparent harm at the site or notable difference (at 95% confidence level) between the site and the potentially impacted ecological receptors;
iii. Individual hazard quotients estimated for the ecological receptors of concern, valued natural resources, or their surrogate species are below unity (1) for each CoC; or
iv. Additional ecological risk evaluations performed under the MDEQ approved work plan conclude that the potential ecological risk is insignificant or readily recoverable.

Section 502. Tier 3 Evaluation (Risk Assessment) Procedures

(a) The Applicant may choose to conduct a site-specific risk assessment (Tier 3), develop and meet site-specific RGs, and have the site-specific RGs approved by MDEQ. This Tier 3 option may entail additional costs to the applicant for MDEQ to subcontract the review of the toxicological and/or risk assessment evaluation. These additional costs shall be paid by the Applicant.

(b) For a human health evaluation of the site or areas within the site (if the site characterization data support such area delineations), the Applicant shall perform risk characterization and present information on risk assessment uncertainty in accordance with the following options:

(1) Deterministic risk assessment according to RAGS - Part A methodology (high-end risk and hazard).

(2) Deterministic risk assessment according to RAGS - Part A (high-end and average risk and hazard).

(3) Probabilistic risk assessment according to EPA's Guiding Principles for Monte Carlo Analysis (EPA/630/R-97/001) or RAGS - Part E methodology to provide probability density function [PDF] for identifying mean, median, and 90th percentile risk and hazard.

(4) Population cancer risk characterization based on the product of average site carcinogenic risk for an individual and the projected number of exposed individuals. Population non-cancer hazard characterization will be based on the projected number of individuals who are likely to be exposed resulting in the hazard index for each specified systemic effect exceeding one (1).

(c) The human health evaluation report shall include, at a minimum, four components: hazard identification, toxicity assessment, exposure assessment, and characterization of risk and uncertainty.

(1) **Hazard identification** - This component presents the site history, area(s) where releases have occurred, and the identified site-related chemicals (i.e., CoCs). Site data shall be compiled at the 95% UCL of the mean and compared with the 95% UCL of the mean background data to establish whether the concentration for a detected chemical is above or below background level.

(2) **Toxicity assessment** - This component requires the identification of CoCs as carcinogenic, non-carcinogenic (causing systemic effects), or both. Toxicity values used in the risk assessment are slope factors and reference doses and must be obtained from:

i. EPA's Integrated Risk Information System (IRIS),
ii. Health Effects and Assessment Summary Tables (HEAST),
iii. Toxicological Profiles prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), and
iv. other peer-reviewed reference sources or literature approved by MDEQ.

(3) **Exposure Assessment** - This component estimates the type and magnitude of exposures to the CoCs that are present at or migrating from the Site. The results of the exposure assessment are combined with chemical-specific toxicity information to characterize potential risks. The general procedure for conducting an exposure assessment is outlined in Chapter 6 of RAGS.

(4) **Characterization of Risk and Uncertainty** - This section describes the final step of the health risk assessment process. In this step, the toxicity and exposure assessments are summarized and integrated into quantitative and qualitative expressions of risk. Major assumptions, scientific judgments, and, to the extent possible, estimates of the uncertainties embodied in the assessment are also presented.

(d) Non-carcinogens that act on the same organ systems can be identified in Table 2, EPA's Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128) or Appendix A, Tables E, Title 35 Illinois Administrative Code Part 742, as amended. The Applicant must identify the uncertainty associated with each toxicity

value. Toxicity values with a high degree of uncertainty should not be used in the risk assessment.

(e) The Applicant shall provide information on the CoC exposure point concentrations (EPCs), activities, and exposure routes that lead to exposure. Site-specific information in combination with relevant information found in EPA's Exposure Factors Handbook (Volumes I, II, and III, EPA's National Center for Environmental Assessment, March 1998), AIHC's Exposure Factors Sourcebook, or other peer-reviewed literature approved by MDEQ may be used to assess exposure. At a minimum, the exposure assessment shall include:

(1) a SCEM to provide the basis for determining which exposure pathways are complete; and
(2) specific input values and their basis (references) for exposure parameters such as the exposure frequency (days per year), duration (number of years), and absorption factors.

(f) Carcinogenic risk and non-carcinogenic hazard posed by the CoCs shall be estimated for the Site or areas within the Site where past releases have occurred. Risks from all complete exposure pathways (i.e., incidental ingestion, dermal contact, inhalation of volatiles or particulates), and contaminated on-site food sources (indirect exposure) shall be characterized, as identified in the SCEM.

(1) Carcinogenic risks from individual CoCs for all complete exposure pathways shall be summed to provide the total site carcinogenic risk (cumulative excess lifetime cancer risk to an individual).

(2) Non-carcinogenic hazards (hazard quotients) from individual CoCs that act on the same organ or organ system for all complete exposure pathways shall be summed to provide the site hazard indices.

(g) The following risk assessment protocols shall be followed for assessing special chemicals or categories of chemicals, unless otherwise approved by MDEQ:

(1) Chlorinated dioxins and dibenzofurans - The evaluation of chlorinated dioxins and dibenzofurans must be consistent with EPA Region IV's Human Health Risk Assessment Bulletins: Supplement to RAGS (http://www.epa.gov/region04/waste/ots/healtbul.htm).

(2) Lead and lead-based compounds - For the assessment of risk to children (if such receptors are reasonably anticipated to be present under the current and future use scenarios), the EPA's Integrated Exposure Uptake Biokinetic Model (IEUBK) (EPA/540/R-93/081) shall be used. If adults are the receptors, the Adult Lead Model published in the "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (December 1996) by

the EPA Technical Review Workgroup (TRW) shall be used to assess the hazard of lead exposure.

(3) Polycyclic aromatic hydrocarbons (PAHs) - The evaluation of PAHs must be consistent with EPA Region IV's Human Health Risk Assessment Bulletins: Supplement to RAGS (http://www.epa.gov/region04/waste/ots/healtbul.htm).

(4) Polychlorinated biphenyls (PCBs) – A slope factor of 7.7 $(mg/kg/day)^{-1}$ shall be used for total PCBs. If congener-specific or group-specific (mono- through deca-chlorinated) biphenyls are analyzed and quantified using Modified EPA Method 1668, the slope factor to be used will be 2.0 $(mg/kg/day)^{-1}$ for tri-, tetra-, penta-, hexa-, and hepta-chlorinated PCBs. Slope factors lower than 2.0 $(mg/kg/day)^{-1}$may be used if there are low concentrations of 2,3,7,8-substituted PCBs). The lowest slope factor of 0.4 $(mg/kg/day)^{-1}$ can be used if 2,3,7,8-substituted PCBs are not present. The Applicant shall bear the burden of providing documentation to MDEQ to justify using slope factors lower than 7.7 $(mg/kg/day)^{-1}$ in the risk assessment report.

(5) Radioactive materials or radionuclides - The risk assessment of radioactive materials shall be in accordance with Chapter 10 of RAGS - Part A. Other methodologies (e.g., dose reconstruction for exposure assessment) shall be approved by MDEQ on a case-by-case basis.

Section 503. Tier 3 Ecological Risk Evaluation Procedures

(a) For the entire Site or areas within the Site (if the site physical characteristics support delineations of different ecosystems), the Applicant shall perform screening and/or more in-depth ecological risk evaluations and present uncertainty associated with the evaluations in accordance with the following options:

(1) Identify the ecological receptors of concern and compare CoC concentrations in the potentially impacted media with their respective benchmark or threshold values that are protective of the receptors of ecological concern. The initial screening levels and procedures are available in the EPA Region 4 Ecological Risk Assessment Bulletins-- Supplement to RAGS (http://www.epa.gov/region04/waste/ots/ecolbul.htm).

(2) Additional ecological benchmark values are available from EPA (e.g., Office of Technical Services Supplemental Guidance to RAGs: Region IV), U.S. Fish and Wildlife Service, the National Atmospheric and Oceanic Administration, or other values in peer-reviewed literature, as appropriate.

(3) Conduct biological field surveys for species diversity and abundance in the potentially impacted area and a reference (background) area and compare both survey results to determine whether there are significant differences at 95% level of confidence.

(4) Identify assessment and measurement endpoints and perform a deterministic risk evaluation on the receptors of ecological concern or their indicator species by the hazard quotient method.

(5) Perform additional ecological risk evaluations based on an MDEQ-approved work plan submitted by the Applicant that is consistent with the EPA's Framework for Ecological Risk Assessment guidance and its subsequent update.

(b) A deterministic risk evaluation shall include a minimum of four components: problem formulation, ecological effects assessment, exposure assessment, and characterization of risk and uncertainty.

(1) **Problem formulation** - This component presents the site history (including documented incidents of readily apparent harm), physical characteristics, area(s) where releases have occurred, and identified site-related chemicals (i.e., CoCs). This component also proposes and provides the rationale for identifying any ecological receptors of concern and valued resources present on site that may be impacted by the CoCs. The basis for assessment and measurement endpoint(s) selection should be provided to MDEQ.

(2) **Ecological effects assessment** - This component requires the identification of potential or known acute and chronic toxic effects of the CoCs on the ecological receptors of concern, valued resources, and any surrogate species proposed as the measurement endpoints. Dose-response data shall be obtained from EPA data bases or other federal/state databases approved by MDEQ.

(3) **Exposure assessment** - This component presents the SCEM and explains how the CoCs are released, transported, bioconcentrated or biomagnified in organisms, and exposed to the ecological receptors of concern or valued resources to be protected. Where appropriate, behavior patterns or reasonable assumptions should be used to estimate daily intake of the CoCs.

(4) **Characterization of risk and uncertainty** - This component shall present the risk assessment results and the underlying uncertainty associated with the assessment method employed. If a quotient method is used, the hazard quotients shall be estimated for the ecological receptors of concern or their surrogates. Risk may be characterized qualitatively by the weight-of-evidence approach based on professional judgment. This component should identify types and magnitude of potential effects anticipated, the spatial and temporal

extent of the effects, significance of the effects on the ecosystems, and recovery potential.

(c) A Tier 3 ecological risk evaluation shall be presented in the following report format: problem formulation, approach and rationale, and presentation of results, uncertainties, and recommendations. In interpreting these evaluation findings, the Applicant should consider the effects of natural succession, non-site related impacts (e.g., farm or urban runoff), and seasonal changes on the data or observations collected. The report format may vary based on MDEQ requirements of the ecological risk evaluation work plan.

Section 504. Tier 3 Risk Assessment Data Requirements

(a) The basic procedure for the assessment of human health and ecological receptors of concern for a Tier 3 risk assessment shall be to obtain representative site characterization data in order to perform a screening or more in-depth risk assessment. Specific requirements for performing a Tier 3 risk assessment include, but are not limited to, the following:

(1) Site characterization data shall be obtained in accordance with the MDEQ-approved Quality Assurance Project Plan (QAPP). The Applicant must demonstrate that the Site has been adequately characterized to delineate the nature and extent of contamination. The scope of the site investigation shall be based on the considerations set forth below.

i. Previous field investigations should be used to define the SCEM and identify data gaps or uncertainty for the nature and extent of the site characterization under this site investigation phase.

ii. Field analytical data may be used to identify areas of contamination and to supplement fixed-laboratory analyses if the Applicant can demonstrate that the field analytical data are comparable to fixed laboratory data by regression or co-relational analyses and meet DQO requirements for precision, accuracy, and reproducibility. A minimum of 10% of the collected samples shall be fixed-laboratory data to demonstrate correlation. Samples must be collected from the areas exhibiting the highest field concentrations and analyzed at a fixed laboratory.

iii. Areas with distinct high concentrations of site-related chemicals shall be segregated from other areas for data compilation purposes. Additional field characterization of high-concentration areas or areas with buried wastes is necessary to support remedial design.

iv. The RAGS procedure for the selection of CoCs shall be followed to properly characterize the Site. The Applicant should exclude background

chemicals, laboratory and field contaminants or artifacts, and chemicals that are essential nutrients present at or below the recommended daily allowance intake levels.

v. All reported data shall be in compliance with the DQOs established in the QAPP. In addition to data review, the data will be validated by a qualified technical individual, familiar with data validation, at the rate of at least 10% or as otherwise specified by MDEQ. The Applicant shall provide data review and validation summaries in the Site Characterization Report.

Chapter 6. RISK-BASED REMEDIATION

Section 601. Risk-Based Remediation Goals

(a) Risk-based remediation goals (RGs) may be quantitative for chemical-specific RGs or qualitative for remedial action-specific RGs. The methodology for quantifying the chemical-specific RGs involves solving for the concentration term given a defined risk level in a deterministic or probabilistic risk assessment and shall be proposed for the principal threat chemicals or all CoCs if the principal threat chemicals cannot be identified. The chemical-specific RG may be modified upward or downward based on risk management considerations by MDEQ. A qualitative RG is established by describing the objectives for engineering controls that reduce site risk to an acceptable level. Risk-based remediation goals shall accompany the proposed remedial action(s) in the Site Characterization Report and/or the Corrective Action Plan (CAP).

(b) **Quantitative RG** - Site-specific information that is relevant to the future use of the Site shall be used in the risk methodology.

(1) The derived value shall not be higher than the soil saturation limit (Csat) for the soil or sediment RG for a CoC with a melting point less than 30 degrees Celsius. The derived value shall not be higher than the solubility limit (Csol) for the groundwater RG for groundwater. At sites where a mixture of contaminants is present (e.g., gasoline), the effective solubility limit may be used if required by MDEQ. Values for Csat and Csol may be found or derived from equations in EPA's Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128), May 1996 or other reference approved by MDEQ.

(2) The derived chemical-specific RG for a carcinogen for the protection of human health shall be (1) the MCL value, (2) a value derived using the acceptable carcinogenic risk level of 1×10^{-6}, or (3) a value defined in state/federal programs and approved by MDEQ.

(3) The derived chemical-specific RG for a non-carcinogen for the protection of human health shall be (1) the MCL value, (2) a value derived using the

acceptable hazard quotient level of unity (1), or a value defined in state/federal programs and approved by MDEQ.

(4) The MDEQ may consider an alternative quantitative or qualitative remediation goal (RG) for each individual contaminant, provided the Applicant can demonstrate to the satisfaction of MDEQ that the attainment of (1) a Risk Level of 10^{-6} for each individual carcinogenic contaminant or (2) a total hazard quotient of not more than 1 for each individual systemic toxicant is technically impracticable except with regard to a background chemical concentration or a regionally prevalent chemical. In no event, except with regard to a background chemical concentration, may either (1) the cumulative (total) site carcinogenic risk exceed 1×10^{-4} for carcinogenic CoCs or (2) the site hazard index (summation of hazard quotients) exceed 3 for non-carcinogenic CoCs affecting the same organ or organ system.

(5) Any of the following methods may be used to derive chemical-specific quantitative RGs in soil or sediment to protect human health:

i. algorithms or methodology employed by MDEQ in deriving the TRGs in Appendix A of this Subpart II;

ii. algorithms or methodology employed by EPA Region III (Technical and Program Support Branch, 3HW70) to derive the Risk-Based Concentrations (RBCs);

iii. algorithms or methodology employed by EPA (Office of Solid Waste and Emergency Response) to derive the SSLs using EPA's Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128), May 1996;

iv. algorithms or methodology employed by the American Society of Testing and Materials (ASTM) to derive the Risk-Based Screening Levels (RBSLs) (Emergency Standard Guide ES 38-94); or

v. other EPA published or peer-reviewed methodologies that have been reviewed and approved by MDEQ.

Note: All input/default values must be approved by MDEQ prior to employing any of the above methodologies.

(6) Fate and transport modeling and/or the use of a dilution-attenuation factor (DAF) to determine migration-to-groundwater soil RGs approved by MDEQ may be used to demonstrate that the concentrations of CoCs at the source area provide adequate protection of human health and the environment at the Site boundary, except when it appears that free product is present.

(7) The acceptable level of a CoC in groundwater at the Site boundary is its groundwater RG or if the boundary is a surface water body, the water quality criteria published by MDEQ, whichever is lower.

(8) Any of the following methods may be used to derive chemical-specific quantitative RGs in groundwater:

i. algorithms or methodology employed by MDEQ in deriving the TRGs in Appendix A of this Subpart II;

ii. algorithms or methodology employed by EPA Region IX (Technical Support Team, DFD-8-B) to derive the Preliminary Remediation Goals (PRGs); or

iii. other EPA published or peer-reviewed methodologies that have been reviewed and approved by MDEQ.

(9) The quotient method may be used to derive quantitative RGs for the protection of an ecological receptor of concern.

(10) The following methods may be used to derive chemical-specific quantitative RGs in soil and sediment for protection of an ecological receptor of concern:

i. algorithms or methodology described in the Risk Assessment Handbook, Volume 2 - Environmental Evaluation (EM 200-1-4) developed by the U.S. Army Corps of Engineers; or

ii. other EPA published or peer-reviewed methodologies that have been reviewed and approved by MDEQ.

(c) **Qualitative RG** - A qualitative RG shall define objectives and describe how land-use restrictions and/or engineering controls are expected to reduce site risk to an acceptable level. The following information shall be presented:

(1) complete exposure pathway that contribute to human health or environmental risk;

(2) the CoC or principal threat chemical and its background concentrations;

(3) physical, chemical, and fate and transport properties of the CoC or principal threat chemical (including the potential for adsorption and monitored natural attenuation);

(4) presence of any man-made or natural conveyances, conduits, or transport routes from the source to the receptor location;

(5) Potential engineering controls that will exclude the exposure pathway based on treatability study data and/or practical experience may also be considered. Engineering controls may include physical or hydraulic control measures, but shall not include the exclusive use of security fencing. Typical engineering controls are presented below and the Applicant may propose alternative controls for MDEQ approval.

i. groundwater recovery trenches and leachate collection systems;
ii. groundwater extraction (pumpage) and treatment systems;
iii. engineered caps with or without liner systems;
iv. slurry walls, funnel-and-gate barrier walls, bio-polymer walls, or any modifications thereof; and
v. permanent structures such as building, driveways, and paved roads.

(d) No further action at the Site shall be based on obtaining either the quantitative or qualitative RGs, or both, and/or other terms and conditions stipulated by MDEQ (i.e., Brownfield Agreement, Corrective Action Plan). The Applicant has the option to propose either type of RGs or a combination of the two for delineated areas of the Site, depending on the site-specific factors, chemical data, and risk management considerations approved by the MDEQ. The following criteria shall be met for this determination:

(1) The remedial action has achieved the chemical-specific RGs based on verification sampling and analyses at the point of exposure or at the contaminated source area. The 95% UCL of the normalized verification sample data must be less that the chemical-specific RG.

(2) The engineered control measures proposed by the Applicant and approved by MDEQ are completed.

(3) The groundwater quality at the Site boundary shall not exceed MCLs or risk-based TRGs for groundwater identified in Appendix A. The Point of Compliance is the Site Boundary.

(4) Free product must be removed from the Site, unless it can be demonstrated to the satisfaction of MDEQ that removal of the free product is technically impracticable and that the contamination is confined and will remain confined within the Site boundaries. Free product is considered to exist if:

i. concentrations in soil exceed Csat for CoCs with a melting point of less than 30 degrees Celsius;
ii. concentrations in groundwater exceed Csol for any CoC or the effective Csol or
iii. measurable using best available technologies.

Chapter 7. PETROLEUM HYDROCARBONS

Section 701. Introduction

(a) Specific procedures and evaluation criteria have been developed for sites with petroleum hydrocarbon contamination. This criteria has been developed to simplify the contaminant analyses required to characterize the site and to establish site-specific remediation goals (RGs). Petroleum hydrocarbon indicator compounds (i.e., Benzene, Toluene, PAHs, etc.) may not be quantifiable at the Tier 1 TRG Table concentrations because high petroleum hydrocarbon concentrations in the sample may cause analytical interferences resulting in either of the following:

(1) Dilution of the extract, which would cause elevated detection limits and useless surrogate recovery data; and/or

(2) Inaccurate compound identification and quantification, due to a poor peak separation or an elevated baseline during chromatography.

(b) In addition, of the 250 individual compounds identified in petroleum, only 95 have toxicity data. Of these 95 compounds with toxicity data, only 25 have sufficient data to develop toxicity criteria. The interactive effects of all compounds present in TPH cannot be determined by data on 25 individual compounds. Therefore, to account for these unknowns, as well as to account for instances as described in Section 701(a), these procedures have been developed.

(c) To evaluate human health and environmental risks specific to a Site under the circumstances in Section 701(a)(1) and (2), MDEQ has developed procedures for petroleum hydrocarbon contaminated Sites.

Section 702. Petroleum Hydrocarbon Evaluation Procedures

(a) The Applicant shall utilize the procedures presented herein for the evaluation of potential human health and environmental risks from petroleum hydrocarbons in soil and groundwater.

(b) A Tier 1 Evaluation of indicator compounds of petroleum hydrocarbons **and** TPH is required to establish the vertical and horizontal extent of indicator compound concentrations **and** TPH below the unrestricted values of the Tier 1 TRG Table.

(c) A Site Ecological Checklist must be completed.

(d) Petroleum-impacted soil and groundwater shall be assessed using the petroleum hydrocarbon indicator compounds, TPH-GRO, and TPH-DRO as presented in Appendix B, Table 1. Petroleum hydrocarbon categories presented in Appendix B, Table 1 represent typical hydrocarbon products. The Applicant shall correlate the

site-specific hydrocarbon release and/or knowledge of the released hydrocarbon product to the appropriate category listed in Appendix B, Table 1. If the specific product that has been released is unknown, then a complete analytical evaluation must be conducted.

(e) The Applicant shall perform soil and groundwater laboratory testing for the following indicator compounds:

(1) Volatile Organic Compounds, **including MTBE** by SW-846 Method 8260B, or other Method approved by MDEQ.[1]

(2) Polycyclic Aromatic Hydrocarbons (PAHs) by Method 8310, with appropriate sample extraction, clean-up and instrumental finish. Analysis to be conducted for the PAHs listed in Appendix B, Table 1, or other Method approved by MDEQ.

(3) Metals[2] by SW-846 Method 6010, 6020, or the appropriate 7000 series, or other Method approved by MDEQ.

(4) Methyl ethyl ketone[2] by SW-846 Method 8260B, or other Method approved by MDEQ.

(5) Methyl isobutyl ketone[2] by SW-846 Method 8260B, or other Method approved by MDEQ.

Note: [1]All soil samples collected for VOC analysis must be collected in a manner consistent with MDEQ's Guidance for Collecting Volatile Organic Compounds in Soil, unless otherwise approved by MDEQ.
[2] When suspected to be present

(f) Although lead (organic and inorganic) has not been used as a gasoline additive for some time (since the late 1970's to early 1980's), there may be sites where lead (organic and inorganic) may be present due to historical activities on the Site. At sites where lead is suspected to be present as a potential site-related compound, inorganic lead and organic lead (specifically tetraethyl lead) must be identified as target analytes by appropriate analytical methods approved by MDEQ.

Section 703. Tier 1 Petroleum Hydrocarbon Evaluation

(a) A Tier 1 Evaluation of indicator compounds of petroleum hydrocarbons, TPH-GRO, and TPH-DRO is required to establish the extent of indicator compound concentrations and TPH-GRO/DRO below the Tier 1 TRG Table.

(b) Results of the indicator compound analysis, TPH-GRO, and TPH-DRO shall be compared with the TRGs presented in the Tier 1 TRG Table in Appendix A utilizing the Tier 1 Evaluation Procedures outlined in Section 302 of this Subpart II.

(c) The Applicant shall address a hydrocarbon release using TPH analyses using SW-846 Method 8015B or other Method approved by MDEQ and by analyzing the indicator compounds as described in Section 701.

(d) In areas of the site where the indicator compounds cannot be quantified to the Tier 1 Target Remedial Goal concentrations, the Applicant has the option of either:

(1) conducting a Tier 1 Evaluation utilizing the Tier 1 Evaluation Procedures outlined in Section 302 of this Subpart II for TPH-GRO and TPH-DRO;
(2) conducting a Tier 2 Evaluation using TPH Fractioning; or
(3) conducting a Tier 3 Evaluation using methods approved by MDEQ.

Section 704. Tier 2 Petroleum Hydrocarbon Evaluation - TPH Fractioning

(a) A Tier 2 Petroleum Hydrocarbon Evaluation is primarily utilized in cases as described in Section 701 of this Subpart II where indicator compound concentrations cannot be determined due to dilution and interference and where the concentrations of TPH-GRO/DRO exceed the restricted Tier 1 TRG levels for TPH-GRO/DRO. Along with the required comparison of indicator compounds as described in Section 703(b) of this Subpart II, the Applicant shall have the option of utilizing the TPH Carbon Fraction TRGs in Table 2 of Appendix B.

(b) **Massachusetts Method**

(1) The Massachusetts Department of Environmental Protection (MADEP) VPH/EPH Approach may be utilized to evaluate petroleum hydrocarbons under Tier 2. This method quantifies the total petroleum hydrocarbon fractions into collective aliphatic and aromatic ranges. To account for the hydrocarbon ranges present in contaminated media, MADEP's Volatile Petroleum Hydrocarbon (VPH) method and Extractible Petroleum Hydrocarbon (EPH) method have been developed. A detailed description of the MADEP VPH/EPH Approach may be found on the MADEP Web Site at (http://www.state.ma.us/dep/bwsc/vph_eph.htm).

(2) The following principles form the basis for this approach:

i. Petroleum products are comprised mainly of aliphatic/alicyclic and aromatic hydrocarbon compounds.

ii. Aromatic hydrocarbons appear to be more toxic than aliphatic compounds.

iii. The toxicity of aliphatic compounds appear to be related to their carbon number/molecular weight.

(3) Under this approach, the non-cancer toxicity of petroleum contaminated soil or water has been established by (1) determining the collective concentrations of specified ranges of aliphatic and aromatic hydrocarbons, and (2) assigning a toxicity value to each range. Well-characterized compounds within specified ranges have been selected as "surrogate" indicators to define the toxicity of the entire range.

Toxicological Approach for Non-Carcinogens				
Hydrocarbon Fraction	**Analytical Fraction**	**Analytical Method**	**Surrogate Compound**	**Reference Dose (mg/kg/d)**
C_5-C_8 Aliphatics	C_5-C_8	VPH	n-Hexane	0.06
C_9-C_{18} Aliphatics	C_9-C_{12}	VPH	n-Nonane	0.6
	C_9-C_{18}	EPH	n-Nonane	0.6
C_{19}-C_{36} Aliphatics	C_{19}-C_{36}	EPH	Eicosane	6.0
C_9-C_{22} Aromatics	C_9-C_{10}	VPH	Pyrene	0.03
	C_{11}-C_{22}	EPH	Pyrene	0.03

(4) Carcinogenic and additional non-carcinogenic effects must be evaluated for the indicator constituents listed in Table 1 of Appendix B.

(5) The EPH method separates the TPH Carbon Ranges (Fractions) into 3 sub-fractions and indicator PAH compounds. The VPH method separates the GRO Carbon Ranges (Fractions) into 3 sub-fractions and indicator compounds (i.e., BTEX, MTBE and naphthalene).

(6) The VPH Method is a Purge and Trap, GC/PID/FID procedure and the EPH Method is a solvent extraction/fractionation GC/FID procedure.

(7) The unrestricted TRGs listed in Table 2 of Appendix B have been adopted by MDEQ and correlate with the GW-1 groundwater zone the S-1 soil zone as defined by MADEP.

(8) The restricted TRGs listed in Table 2 of Appendix B have been adopted by MDEQ and correlate to the GW-1 groundwater zone and the S-3 soil zone as defined by MADEP.

(9) The Applicant must ensure and provide documentation to MDEQ that the Laboratory conducting the MADEP VPH/EPH Methodology is equipped to so

do and will utilize appropriate Standard Operating Procedures (SOPs) as required by this methodology.

(c) MDEQ may approve other TPH risk evaluation methodologies (e.g., TPHWG Methodology) or combinations thereof under Tier 2.

Section 705. Tier 3 Petroleum Hydrocarbon Evaluation

(a) Alternative petroleum hydrocarbon Remedial Goals (RGs) may be established using a Tier 3 Risk Assessment approach. The alternative RGs shall be reviewed and approved or disapproved by MDEQ on a case-by-case basis.

References

American Society for Testing and Materials (ASTM), Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM E 1739-95), 1995.

Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological Profile for Mineral Oil Hydraulic Fluids, Organophosphate Ester Hydraulic Fluids, and Polyalphaolefin Hydraulic Fluids, 1994.

Massachusetts Department of Environmental Protection, Characterizing Risk posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach, 1996.

Louisiana Department of Environmental Quality, April 1998, Risk Evaluation/Corrective Action Program (Proposed), April 1998.

U.S. Environmental Protection Agency (EPA), Handbook of RCRA Ground-Water Monitoring Constituents, Chemical and Physical Properties, 40 CFR Part 264, Appendix 9. September 1992.

U.S. Environmental Protection Agency (EPA), Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128), May 1996.

U.S. Environmental Protection Agency (EPA), Supplemental Guidance to RAGS: Calculating the Concentration Term, EPA 1992, 9285.7-081 (EPA, 1992a).

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

APPENDIX A

TIER 1 TARGET REMEDIAL GOAL TABLE

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater			Soil							
					Restricted				Unrestricted			
		ug/l	Notes		mg/kg	Notes			mg/kg	Notes		
ACENAPHTHENE	83329	3.65E+02	N	R	1.23E+05	N	Ing		4.69E+03	N	Ing	
ACENAPHTHYLENE	208968	2.19E+03	N		1.23E+05	N	Ing		4.69E+03	N	Ing	
ACEPHATE	30560191	7.70E+00	C		6.58E+02	C	Ing		7.34E+01	C	Ing	
ACETALDEHYDE	75070	1.63E+00	C	R	2.34E+01	C	Inh	1	1.53E+01	C	Inh	1
ACETOCHLOR	34256821	7.30E+02	N		4.09E+04	N	Ing		1.56E+03	N	Ing	
ACETONE (DIMETHYL KETONE)	67641	6.08E+02	N	R	1.04E+05		Csat		7.82E+03	N	Ing	
ACETONITRILE (CYANOMETHANE)	75058	1.25E+02	N	R	1.11E+02	N	Inh	1	1.11E+02	N	Inh	1
ACETOPHENONE	98862	4.16E-02	N	R	2.63E+03		Csat		2.63E+03		Csat	
ACROLEIN	107028	4.16E-02	N	R	4.09E+04	N	Ing		1.56E+03	N	Ing	
ACRYLAMIDE	79061	1.49E-02	C		1.27E+00	C	Ing		1.42E-01	C	Ing	
ACRYLONITRILE	107131	3.67E-02	C		1.06E+01	C	Ing		1.18E+00	C	Ing	
ALACHLOR	15972608	2.00E+00		MCL	7.15E+01	C	Ing		7.98E+00	C	Ing	
ALAR	1596845	5.48E+03	N		3.07E+05	N	Ing		1.17E+04	N	Ing	
ALDICARB	116063	3.65E+01	N	R	2.04E+02	N	Ing		7.82E+01	N	Ing	
ALDICARB SULFONE	1646884	3.65E+01	N		2.04E+03	N	Ing		7.82E+01	N	Ing	
ALDRIN	309002	3.94E-03	C	R	3.37E-01	C	Ing		3.76E-02	C	Ing	
ALUMINUM	7429905	3.65E+04	N		2.04E+06	N	Ing		7.82E+04	N	Ing	
AMINODINITROTOLUENES		2.19E+00	N		1.23E+02	N	Ing		4.69E+00	N	Ing	
4-AMINOPYRIDINE	504245	7.30E-01	N		4.09E+01	N	Ing		1.56E+00	N	Ing	
AMMONIA	7664417	2.09E+02	N									
ANILINE	62533	1.17E+01	C		1.00E+03	C	Ing		1.12E+02	C	Ing	
ANTHRACENE	120127	4.34E+01		Csol	6.13E+05	N	Ing		2.35E+04	N	Ing	
ANTIMONY	7440360	6.00E+00		MCL	8.17E+01	N	Ing		3.13E+01	N	Ing	
ANTIMONY PENTOXIDE	1314609	1.83E+01	N		1.02E+02	N	Ing		3.91E+01	N	Ing	
ANTIMONY TETROXIDE	1332816	1.46E+01	N		8.17E+01	N	Ing		3.13E+01	N	Ing	
ANTIMONY TRIOXIDE	1309644	1.46E+01	N		8.17E+01	N	Ing		3.13E+01	N	Ing	
ARSENIC	7440382	5.00E+01		MCL	3.82E+00	C	Ing		4.26E-01	C	Ing	
ARSINE	7784421	1.02E-01	N									
ASSURE	76578148	3.29E+02	N		1.84E+04	N	Ing		7.04E+02	N	Ing	
ATRAZINE	1912249	3.00E+00		MCL	2.58E+01	C	Ing		2.88E+00	C	Ing	
AZOBENZENE	103333	6.09E-01	C		5.20E+01	C	Ing		5.81E+00	C	Ing	
BARIUM	7440393	2.00E+03		MCL	1.43E+04	N	Ing		5.48E+03	N	Ing	
BAYGON	114261	1.46E+02	N		8.18E+03	N	Ing		3.13E+02	N	Ing	
BAYTHROID	68359375	9.13E+02	N		5.11E+04	N	Ing		1.96E+03	N	Ing	
BENTAZON	25057890	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
BENZ[A]ANTHRACENE	56553	9.17E-02	C	R	7.84E+00	C	Ing		8.75E-01	C	Ing	
BENZALDEHYDE	100527	3.65E+03	N		2.04E+05	N	Ing		7.82E+03	N	Ing	
BENZENE	71432	5.00E+00		MCL	1.36E+00	C	Inh	1	8.87E-01	C	Inh	1
BENZENETHIOL	108985	6.08E-02	N		2.04E+01	N	Ing		7.82E-01	N	Ing	
BENZIDINE	92875	2.91E-04	C		2.49E-02	C	Ing		2.78E-03	C	Ing	
BENZOIC ACID	65850	1.46E+05	N	R	8.17E+05	N	Ing		3.13E+05	N	Ing	
BENZO[A]PYRENE	50328	2.00E-01		MCL	7.84E-01	C	Ing		8.75E-02	C	Ing	
BENZO[B]FLUORANTHENE	205992	9.17E-02	C	R	7.84E+00	C	Ing		8.75E-01	C	Ing	
BENZO[G,H,I]PERYLENE	191242	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
BENZO[K]FLUORANTHENE	207089	9.17E-01	C	R	7.84E+01	C	Ing		8.75E+00	C	Ing	
BENZYL ALCOHOL	100516	1.10E+04	N		2.04E+05	N	Ing		2.35E+04	N	Ing	
BENZYL CHLORIDE (CHLOROMETHYLBENZENE)	100447	6.21E-02	C	R	3.37E+01	C	Ing		3.76E+00	C	Ing	
BERYLLIUM	7440417	4.00E+00		MCL	1.02E+03	N	Ing		1.56E+02	N	Ing	
BIPHENYL	92524	3.04E+02	N	R	1.02E+04	N	Ing		3.91E+03	N	Ing	
BIS(2-CHLOROETHYL)ETHER	111444	9.20E-03	C	R	4.19E-01	C	Inh	1	2.73E-01	C	Inh	1
BIS(2-CHLOROISOPROPYL)ETHER	108601	2.60E-01	C	R	9.08E+00	C	Inh	1	5.93E+00	C	Inh	1
BIS(CHLOROMETHYL)ETHER	542881	4.80E-05	C		2.60E-02	C	Ing		2.90E-03	C	Ing	
BIS(2-ETHYLHEXYL)PHTHALATE	117817	6.00E+00		MCL	4.09E+02	C	Ing		4.56E+01	C	Ing	
BORON	7440428	3.29E+03	N		4.08E+03	N	Ing		4.08E+03	N	Ing	
BROMODICHLOROMETHANE (DICHLOROBROMOMETHANE)	75274	1.68E-01	C	R	1.89E+00	C	Inh	1	1.24E+00	C	Inh	1
BROMOETHENE (VINYL BROMIDE)	593602	1.12E-01	C	R	1.26E-01	N	Inh	1	1.26E-01	N	Inh	1
BROMOFORM (METHYL TRIBROMIDE)	75252	8.48E+00	C	R	9.01E+01	C	Inh	1	5.88E+01	C	Inh	1
BROMOMETHANE (METHYL BROMIDE)	74839	8.52E+00	N	R	2.97E+00	N	Inh	1	2.97E+00	N	Inh	1
BROMOPHOS	2104963	1.83E+02	N		1.02E+04	N	Ing		3.91E+02	N	Ing	
1,3-BUTADIENE	106990	6.96E-03	C									
1-BUTANOL	71363	3.65E+03	N	R	1.05E+04		Csat		7.82E+03	N	Ing	
2-BUTANONE (METHYL ETHYL KETONE)	78933	1.91E+03	N	R	8.45E+01	N	Inh	1	8.45E+01	N	Inh	1
BUTYLBENZYLPHTHALATE	85687	2.69E+03		Csol	9.28E+02		Csat		9.28E+02		Csat	
BUTYLATE	2008415	1.83E+03	N		1.02E+04	N	Ing		3.91E+03	N	Ing	
N-BUTYLBENZENE	104518	2.43E+02	N		8.18E+04	N	Ing		3.13E+03	N	Ing	
SEC-BUTYLBENZENE	135988	2.43E+02	N		8.18E+04	N	Ing		3.13E+03	N	Ing	
TERT-BUTYLBENZENE	98066	2.43E+02	N		8.18E+04	N	Ing		3.13E+03	N	Ing	
CADMIUM	7440439	5.00E+00		MCL	1.02E+03	N	Ing		3.91E+01	N	Ing	
CALCIUM CYANIDE	592018	1.46E+03	N		8.17E+03	N	Ing		3.13E+03	N	Ing	

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater				Soil							
						Restricted				Unrestricted			
		ug/l		Notes		mg/kg		Notes		mg/kg		Notes	
CAPROLACTAM	105602	1.83E+04	N			1.02E+05	N	Ing		3.91E+04	N	Ing	
CARBARYL	63252	3.65E+03	N			2.04E+04	N	Ing		7.82E+03	N	Ing	
CARBAZOLE	86748	3.35E+00	C	R		2.86E+02	C	Ing		3.19E+01	C	Ing	
CARBOFURAN	1563662	4.00E+01		MCL		1.02E+03	N	Ing		3.91E+02	N	Ing	
CARBON CHLORIDE (CARBON TETRACHLORIDE)	56235	5.00E+00		MCL		5.69E-01	C	Inh	1	3.71E-01	C	Inh	1
CARBON DISULFIDE	75150	1.04E+03	N	R		7.97E+00	N	Inh	1	7.97E+00	N	Inh	1
CARBON TETRACHLORIDE (CARBON CHLORIDE)	56235	5.00E+00		MCL		5.69E-01	C	Inh	1	3.71E-01	C	Inh	1
CARBOSULFAN	55285148	3.65E+02	N			2.04E+04	N	Ing		7.82E+02	N	Ing	
CHLORAL HYDRATE	302170	3.65E+03	N			4.08E+03	N	Ing		4.08E+03	N	Ing	
CHLORANIL	118752	1.66E-01	C			1.42E+01	C	Ing		1.58E+00	C	Ing	
CHLORDANE	57749	2.00E+00		MCL		1.23E+01	N	Ing		1.82E+00	C	Ing	
CHLORINE	7782505	4.16E-01	N			2.04E+05	N	Ing		7.82E+03	N	Ing	
CHLORINE DIOXIDE	10049044	4.17E-01	N			6.13E+04	N	Ing		2.35E+03	N	Ing	
CHLORITE	7758192	1.10E+03	N			6.13E+04	N	Ing		2.35E+03	N	Ing	
CHLOROACETIC ACID	79118	7.30E+01	N			4.08E+03	N	Ing		1.56E+02	N	Ing	
4-CHLOROANILINE	106478	1.46E+02	N	R		8.17E+02	N	Ing		3.13E+02	N	Ing	
CHLOROBENZENE (MONOCHLOROBENZENE)	108907	1.00E+02		MCL		1.19E+00	N	Inh	1	1.19E+00	N	Inh	1
CHLOROBENZILATE	510156	2.48E-01	C			2.12E+01	C	Ing		2.37E+00	C	Ing	
P-CHLOROBENZOIC ACID	74113	7.30E+03	N			4.08E+05	N	Ing		1.56E+04	N	Ing	
CHLORO-1,3-BUTADIENE	126998	1.43E+01	N			4.08E+03	N	Ing		1.56E+03	N	Ing	
1-CHLOROBUTANE	109693	2.43E+03	N			1.84E+05	N	Ing		3.13E+04	N	Ing	
CHLORODIBROMOMETHANE (DIBROMOCHLOROMETHANE)	124481	1.26E-01	C	R		6.81E+01	C	Ing		7.60E+00	C	Ing	
1-CHLORO-1,1-DIFLUOROETHANE	75683	1.02E+05	N										
CHLORODIFLUOROMETHANE (DIFLUOROCHLOROMETHANE)	75456	1.02E+05	N										
CHLOROETHANE	75003	3.64E+00	C			1.97E+03	C	Ing		2.20E+02	C	Ing	
CHLOROETHENE (VINYL CHLORIDE)	75014	2.00E+00		MCL		9.39E-01	C	Inh	1	4.26E-01	C	Ing	
CHLOROFORM (METHANE TRICHLORIDE)	67663	1.55E-01	C	R		4.78E-01	C	Inh	1	3.12E-01	C	Inh	1
CHLOROMETHANE (METHYL CHLORIDE)	74873	1.43E+00	C			4.40E+02	C	Ing		4.91E+01	C	Ing	
4-CHLORO-2-METHYLANILINE	95692	1.15E-01	C			9.87E+00	C	Ing		1.10E+00	C	Ing	
CHLOROMETHYLBENZENE (BENZYL CHLORIDE)	100447	6.21E-02	C	R		3.37E+01	C	Ing		3.76E+00	C	Ing	
4-CHLORO-3-METHYLPHENOL (P-CHLORO-M-CRESOL)	59507	7.30E+04	N	R		4.08E+05	N	Ing		1.56E+05	N	Ing	
BETA-CHLORONAPHTHALENE	91587	4.87E+02	N			1.64E+05	N	Ing		6.26E+03	N	Ing	
O-CHLORONITROBENZENE	88733	4.22E-01	C			2.29E+02	C	Ing		2.55E+01	C	Ing	
P-CHLORONITROBENZENE	100005	5.86E-01	C			3.18E+02	C	Ing		3.55E+01	C	Ing	
2-CHLOROPHENOL	95578	3.04E+01	N	R		1.02E+04	N	Ing		3.91E+02	N	Ing	
2-CHLOROPROPANE	75296	2.12E+02	N										
O-CHLOROTOLUENE	95498	1.22E+02	N			4.08E+04	N	Ing		1.56E+03	N	Ing	
CHLORPYRIFOS	2921882	1.10E+02	N			6.13E+02	N	Ing		2.35E+02	N	Ing	
CHLORPYRIFOS-METHYL	5598130	3.65E+02	N			2.04E+03	N	Ing		7.82E+02	N	Ing	
CHROMIUM III	16065831	5.48E+04	N			3.07E+06	N	Ing		1.17E+05	N	Ing	
CHROMIUM VI	18540299	1.00E+02		MCL		3.81E+02	C	Inh	2	2.27E+02	C	Inh	2
CHRYSENE	218019	9.17E+00	C	R		7.84E+02	C	Ing		8.75E+01	C	Ing	
COBALT	7440484	2.19E+03	N			1.23E+04	N	Ing		4.69E+03	N	Ing	
COKE OVEN EMISSIONS (COAL TAR)	8007452	5.69E-03	C										
COPPER	7440508	1.30E+03		MCL		8.17E+03	N	Ing		3.13E+03	N	Ing	
COPPER CYANIDE	544923	1.83E+02	N			1.02E+04	N	Ing		3.91E+02	N	Ing	
o-CRESOL (2-METHLYPHENOL)	95487	1.83E+03	N			1.02E+05	N	Ing		3.91E+03	N	Ing	
m-CRESOL (3-METHYLPHENOL)	108394	1.83E+03	N			1.02E+05	N	Ing		3.91E+03	N	Ing	
p-CRESOL (4-METHYLPHENOL)	106445	1.83E+02	N			1.02E+04	N	Ing		3.91E+02	N	Ing	
CROTONALDEHYDE	123739	5.58E-03	C			3.01E+00	C	Ing		3.36E-01	C	Ing	
CUMENE (ISOPROPYL BENZENE)	98828	6.79E+02	N	R		9.43E+00	N	Inh	1	9.43E+00	N	Inh	1
CYANAZINE	21725462	7.97E-02	C			6.81E+00	C	Ing		7.60E-01	C	Ing	
CYANIDE (FREE)	57125	2.00E+02		MCL		4.08E+03	N	Ing		1.56E+03	N	Ing	
CALCIUM CYANIDE	592018	1.46E+03	N			8.17E+03	N	Ing		3.13E+03	N	Ing	
COPPER CYANIDE	544923	1.83E+02	N			1.02E+04	N	Ing		3.91E+02	N	Ing	
CYANAZINE	21725462	7.97E-02	C			6.81E+00	C	Ing		7.60E-01	C	Ing	
CYANOGEN	460195	2.43E+02	N			8.18E+04	N	Ing		3.13E+03	N	Ing	
CYANOGEN BROMIDE	506683	3.29E+03	N			1.84E+05	N	Ing		7.04E+03	N	Ing	
CYANOGEN CHLORIDE	506774	1.83E+03	N			1.02E+05	N	Ing		3.91E+03	N	Ing	
HYDROGEN CYANIDE	74908	6.22E+00	N			4.09E+04	N	Ing		1.56E+03	N	Ing	
POTASSIUM CYANIDE	151508	1.83E+03	N			1.02E+04	N	Ing		3.91E+03	N	Ing	
POTASSIUM SILVER CYANIDE	506616	7.30E+03	N			4.08E+04	N	Ing		1.56E+04	N	Ing	
SILVER CYANIDE	506649	3.65E+03	N			2.04E+04	N	Ing		7.82E+03	N	Ing	
SODIUM CYANIDE	143339	1.46E+03	N			8.17E+03	N	Ing		3.13E+03	N	Ing	
THIOCYANATE		1.83E+03	N			1.02E+05	N	Ing		3.91E+03	N	Ing	
ZINC CYANIDE	557211	1.83E+03	N			1.02E+04	N	Ing		3.91E+03	N	Ing	
CYANOMETHANE (ACETONITRILE)	75058	1.25E+02	N	R		1.11E+02	N	Inh	1	1.11E+02	N	Inh	1
CYCLOHEXANONE	108941	1.83E+05	N			1.02E+07	N	Ing		3.91E+05	N	Ing	
CYCLONITE (RDX)	121824	6.09E-01	C			5.20E+01	C	Ing		5.81E+00	C	Ing	

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater				Soil							
						Restricted				Unrestricted			
		ug/l	Notes			mg/kg	Notes			mg/kg	Notes		
CYHALOTHRIN/KARATE	68085858	1.83E+02	N			1.02E+04	N	Ing		3.91E+02	N	Ing	
CYPERMETHRIN	52315078	3.65E+02	N			2.04E+04	N	Ing		7.82E+02	N	Ing	
DACTHAL	1861321	3.65E+02	N			2.04E+04	N	Ing		7.82E+02	N	Ing	
DALAPON	75990	2.00E+02			MCL	6.13E+03	N	Ing		2.35E+03	N	Ing	
DDD	72548	2.79E-01	C		R	2.38E+01	C	Ing		2.66E+00	C	Ing	
DDE	72559	1.97E-01	C		R	1.68E+01	C	Ing		1.88E+00	C	Ing	
DDT	50293	1.97E-01	C		R	1.68E+01	C	Ing		1.88E+00	C	Ing	
DIAZINON	333415	3.29E+01	N			1.84E+03	N	Ing		7.04E+01	N	Ing	
DIBENZOFURAN	132649	2.43E+01	N			8.18E+03	N	Ing		3.13E+02	N	Ing	
DIBENZ[A,H]ANTHRACENE	53703	9.17E-03	C		R	7.84E-01	C	Ing		8.75E-02	C	Ing	
1,4-DIBROMOBENZENE	106376	3.65E+02	N			2.04E+04	N	Ing		7.82E+02	N	Ing	
DIBROMOCHLOROMETHANE (CHLORODIBROMOMETHANE)	124481	1.26E-01	C		R	6.81E+01	C	Ing		7.60E+00	C	Ing	
1,2-DIBROMO-3-CHLOROPROPANE	96128	2.00E-01			MCL	9.99E-02	N	Inh	1	9.99E-02	N	Inh	1
DIBROMOMETHANE (METHYLENE BROMIDE)	74953	6.08E+01	N			2.04E+04	N	Ing		7.82E+02	N	Ing	
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	106934	5.00E-02			MCL	6.73E-02	C	Ing		7.51E-03	C	Ing	
DI-N-BUTYLPHTHALATE	84742	3.65E+03	N		R	2.28E+03		Csat		2.28E+03		Csat	
DICAMBA	1918009	1.10E+03	N			6.13E+04	N	Ing		2.35E+03	N	Ing	
1,2-DICHLOROBENZENE	95501	6.00E+02			MCL	2.79E+02	N	Inh	1	2.79E+02	N	Inh	1
1,3-DICHLOROBENZENE	541731	5.48E+00	N			1.84E+03	N	Ing		7.04E+01	N	Ing	
1,4-DICHLOROBENZENE	106467	7.50E+01			MCL	2.38E+02	C	Ing		2.66E+01	C	Ing	
3,3'-DICHLOROBENZIDINE	91941	1.49E-01	C		R	1.27E+01	C	Ing		1.42E+00	C	Ing	
DICHLOROBROMOMETHANE (BROMODICHLOROMETHANE)	75274	1.68E-01	C		R	1.89E+00	C	Inh	1	1.24E+00	C	Inh	1
1,4-DICHLORO-2-BUTENE	764410	1.35E-03	C										
DICHLORODIFLUOROMETHANE	75718	3.48E+02	N			4.09E+05	N	Ing		1.56E+04	N	Ing	
1,1-DICHLOROETHANE	75343	7.98E+02	N		R	1.16E+02	N	Inh	1	1.16E+02	N	Inh	1
1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE)	107062	5.00E+00			MCL	6.21E-01	C	Inh	1	4.06E-01	C	Inh	1
1,1-DICHLOROETHENE (1,1 - DCE)	75354	7.00E+00			MCL	1.18E-01	C	Inh	1	7.72E-02	C	Inh	1
CIS-1,2-DICHLOROETHENE	156592	7.00E+01			MCL	1.21E+03		Csat		7.82E+02	N	Ing	
TRANS-1,2-DICHLOROETHENE	156605	1.00E+02			MCL	3.07E+03		Csat		1.56E+03	N	Ing	
DICHLOROMETHANE (METHYLENE CHLORIDE)	75092	5.00E+00			MCL	2.19E+01	C	Inh	1	1.43E+01	C	Inh	1
2,4-DICHLOROPHENOL	120832	1.10E+02	N		R	6.13E+02	N	Ing		2.35E+02	N	Ing	
2,4-DICHLOROPHENOXYACETIC ACID (2,4-D)	94757	7.00E+01			MCL	2.04E+03	N	Ing		7.82E+02	N	Ing	
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACID	94826	2.92E+02	N			1.64E+04	N	Ing		6.26E+02	N	Ing	
1,2-DICHLOROPROPANE	78875	5.00E+00			MCL	4.45E-01	N	Inh	1	4.45E-01	N	Inh	1
2,3-DICHLOROPROPANOL	616239	1.10E+02	N			6.13E+03	N	Ing		2.35E+02	N	Ing	
1,3-DICHLOROPROPENE (1,3-DICHLOROPROPYLENE, CIS + TRANS)	542756	8.42E-02	C		R	3.52E-01	N	Inh	1	3.52E-01	N	Inh	1
DICHLORVOS	62737	2.31E-01	C			1.97E+01	C	Ing		2.20E+00	C	Ing	
DICOFOL	115322	1.52E-01	C			1.30E+01	C	Ing		1.45E+00	C	Ing	
DICYCLOPENTADIENE	77736	4.38E-01	N			6.13E+04	N	Ing		2.35E+03	N	Ing	
DIELDRIN	60571	4.19E-03	C		R	3.58E-01	C	Ing		3.99E-02	C	Ing	
DIETHYLPHTHALATE	84662	2.92E+04	N		R	1.97E+03		Csat		1.97E+03		Csat	
DIETHYLENE GLYCOL, MONOETHYL ETHER	111900	7.30E+04	N			4.09E+06	N	Ing		1.56E+05	N	Ing	
DI(2-ETHYLHEXYL)ADIPATE	103231	4.00E+02			MCL	4.77E+03	C	Ing		5.32E+02	C	Ing	
DIETHYLSTILBESTROL	56531	1.42E-05	C			1.22E-03	C	Ing		1.36E-04	C	Ing	
DIFENZOQUAT (AVENGE)	43222486	2.92E+03	N			1.64E+05	N	Ing		6.26E+03	N	Ing	
DIFLUOROCHLOROMETHANE (CHLORODIFLUOROMETHANE)	75456	1.02E+05	N										
1,1-DIFLUOROETHANE	75376	8.03E+04	N										
DIISOPROPYL METHYLPHOSPHONATE (DIMP)	1445756	2.92E+03	N			1.64E+05	N	Ing		6.26E+03	N	Ing	
3,3'-DIMETHOXYBENZIDINE	119904	4.78E+00	C			4.09E+02	C	Ing		4.56E+01	C	Ing	
2,4-DIMETHYLANILINE HYDROCHLORIDE	21436964	1.15E-01	C			9.87E+00	C	Ing		1.10E+00	C	Ing	
2,4-DIMETHYLANILINE	95681	8.93E-02	C			7.63E+00	C	Ing		8.52E-01	C	Ing	
N,N-DIMETHYLANILINE	121697	7.30E+01	N			4.08E+03	N	Ing		1.56E+02	N	Ing	
3,3'-DIMETHYLBENZIDINE	119937	7.28E-03	C			6.22E-01	C	Ing		6.94E-02	C	Ing	
1,1-DIMETHYLHYDRAZINE	57147	2.58E-02	C			2.20E+00	C	Ing		2.46E-01	C	Ing	
1,2-DIMETHYLHYDRAZINE	540738	1.81E-03	C			1.55E-01	C	Ing		1.73E-02	C	Ing	
DIMETHYL KETONE (ACETONE)	67641	6.08E+02	N		R	1.04E+05		Csat		7.82E+03	N	Ing	
2,4-DIMETHYLPHENOL	105679	7.30E+02	N		R	4.08E+04	N	Ing		1.56E+03	N	Ing	
2,6-DIMETHYLPHENOL	576261	2.19E+01	N			1.23E+03	N	Ing		4.69E+01	N	Ing	
3,4-DIMETHYLPHENOL	95658	3.65E+01	N			2.04E+03	N	Ing		7.82E+01	N	Ing	
DIMETHYLPHTHALATE	131113	3.65E+05	N			2.04E+07	N	Ing		7.82E+05	N	Ing	
1,2-DINITROBENZENE	528290	1.46E+01	N			8.17E+02	N	Ing		3.13E+01	N	Ing	
1,3-DINITROBENZENE	99650	3.65E+00	N			2.04E+02	N	Ing		7.82E+00	N	Ing	
1,4-DINITROBENZENE	100254	1.46E+01	N			8.17E+02	N	Ing		3.13E+01	N	Ing	
4,6-DINITRO-O-CYCLOHEXYL PHENOL	131895	7.30E+01	N			4.09E+03	N	Ing		1.56E+02	N	Ing	
4,6-DINITRO-2-METHYLPHENOL	534521	3.65E+00	N			2.04E+02	N	Ing		7.82E+00	N	Ing	
2,4-DINITROPHENOL	51285	7.30E+01	N		R	4.08E+02	N	Ing		1.56E+02	N	Ing	
DINITROTOLUENE MIXTURE		9.85E-02	C			8.42E+00	C	Ing	3	9.39E-01	C	Ing	3
2,4-DINITROTOLUENE	121142	7.30E+01	N		R	4.08E+02	N	Ing	3	1.56E+02	N	Ing	3
2,6-DINITROTOLUENE	606202	3.65E+01	N		R	2.04E+03	N	Ing	3	7.82E+01	N	Ing	3

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater			Soil							
					Restricted				Unrestricted			
		ug/l		Notes	mg/kg		Notes		mg/kg		Notes	
DINOSEB	88857	7.00E+00		MCL	2.04E+02	N	Ing		7.82E+01	N	Ing	
DI-N-OCTYLPHTHALATE	117840	2.00E+01		Csol	4.08E+03	N	Ing		1.56E+03	N	Ing	
1,4-DIOXANE	123911	6.09E+00	C		5.20E+02	C	Ing		5.81E+01	C	Ing	
DIOXATHION	78342	5.48E+01	N		3.07E+03	N	Ing		1.17E+02	N	Ing	
DIOXINS & FURANS												
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)	1746016	3.00E-05		MCL	3.82E-05	C	Ing		4.26E-06	C	Ing	
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (HpCDD)	35822469	4.46E-05	C		3.82E-03	C	Ing		4.26E-04	C	Ing	
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (HxCDD)	39227286	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN (HxCDD)	57653857	1.08E-05	C		9.23E-04	C	Ing		1.03E-04	C	Ing	
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (HxCDD)	19408743	1.08E-05	C		9.23E-04	C	Ing		1.03E-04	C	Ing	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	3268879	4.46E-04	C		3.82E-02	C	Ing		4.26E-03	C	Ing	
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN (PeCDD)	40321764	8.93E-07	C		7.63E-05	C	Ing		8.52E-06	C	Ing	
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (HpCDF)	67562394	4.46E-05	C		3.82E-03	C	Ing		4.26E-04	C	Ing	
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (HpCDF)	55673897	4.46E-05	C		3.82E-03	C	Ing		4.26E-04	C	Ing	
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (HxCDF)	70648269	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (HxCDF)	57117449	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (HxCDF)	72918219	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN (HxCDF)	60851345	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	39001020	4.46E-04	C		3.82E-02	C	Ing		4.26E-03	C	Ing	
1,2,3,7,8-PENTACHLORODIBENZOFURAN (PeCDF)	57117416	8.93E-06	C		7.63E-04	C	Ing		8.52E-05	C	Ing	
2,3,4,7,8-PENTACHLORODIBENZOFURAN (PeCDF)	57117314	8.93E-07	C		7.63E-05	C	Ing		8.52E-06	C	Ing	
2,3,7,8-TETRACHLORODIBENZOFURAN (TCDF)	51207319	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
DIPHENYLAMINE	122394	9.13E+02	N		5.10E+03	N	Ing		1.96E+03	N	Ing	
1,2-DIPHENYLHYDRAZINE	122667	8.37E-02	C		7.15E+00	C	Ing		7.98E-01	C	Ing	
DIQUAT	85007	2.00E+01		MCL	4.50E+03	N	Ing		1.72E+02	N	Ing	
DISULFOTON	298044	1.46E+00	N		8.17E+00	N	Ing		3.13E+00	N	Ing	
1,4-DITHIANE	505293	3.65E+02	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
DIURON	330541	7.30E+01	N		4.09E+03	N	Ing		1.56E+02	N	Ing	
ENDOSULFAN	115297	2.19E+02	N	R	1.23E+03	N	Ing		4.69E+02	N	Ing	
ENDRIN	72208	2.00E+00		MCL	6.13E+01	N	Ing		2.35E+01	N	Ing	
EPICHLOROHYDRIN	106898	2.03E+00	N		4.08E+02	N	Ing		6.45E+01	C	Ing	
ETHION	563122	1.83E+01	N		1.02E+03	N	Ing		3.91E+01	N	Ing	
2-ETHOXYETHANOL	110805	1.46E+04	N		1.02E+05	N	Ing		3.13E+04	N	Ing	
ETHYL ACETATE	141786	5.48E+03	N		1.84E+06	N	Ing		7.04E+04	N	Ing	
ETHYLBENZENE	100414	7.00E+02		MCL	3.95E+02		Csat		3.95E+02		Csat	
ETHYLENE DIAMINE	107153	7.30E+02	N		4.08E+03	N	Ing		1.56E+03	N	Ing	
ETHYLENE DIBROMIDE (1,2- DIBROMOETHANE)	106934	5.00E-02		MCL	6.73E-02	C	Ing		7.51E-03	C	Ing	
ETHYLENE DICHLORIDE (1,2-DICHLOROETHANE)	107062	5.00E+00		MCL	6.21E-01	C	Inh	1	4.06E-01	C	Inh	1
ETHYLENE GLYCOL	107211	7.30E+04	N		4.08E+05	N	Ing		1.56E+05	N	Ing	
ETHYLENE GLYCOL MONOBUTYL ETHER (2-BUTOXYETHANOL)	111762	1.09E+04	N		1.02E+06	N	Ing		3.91E+04	N	Ing	
ETHYLENE OXIDE	75218	2.32E-02	C		5.61E+00	C	Ing		6.26E-01	C	Ing	
ETHYLENE THIOUREA	96457	6.09E-01	C		1.63E+01	N	Ing		5.81E+00	C	Ing	
ETHYL ETHER	60297	1.22E+03	N		4.08E+05	N	Ing		1.56E+04	N	Ing	
ETHYL METHACRYLATE	97632	5.48E+02	N		1.84E+04	N	Ing		7.04E+03	N	Ing	
FENAMIPHOS	22224926	9.13E+00	N		5.11E+02	N	Ing		1.96E+01	N	Ing	
FLUOMETURON	2164172	4.75E+02	N		2.66E+04	N	Ing		1.02E+03	N	Ing	
FLUORANTHENE	206440	1.46E+03	N	R	8.17E+04	N	Ing		3.13E+03	N	Ing	
FLUORENE	86737	2.43E+02	N	R	8.17E+04	N	Ing		3.13E+03	N	Ing	
FLUORINE (SOLUBLE FLUORIDE)	7782414	4.00E+03		MCL	1.23E+04	N	Ing		4.69E+03	N	Ing	
FOMESAFEN	72178020	3.52E-01	C		3.01E+01	C	Ing		3.36E+00	C	Ing	
FONOFOS	944229	7.30E+01	N		4.09E+03	N	Ing		1.56E+02	N	Ing	
FORMALDEHYDE	50000	7.30E+03	N		4.08E+04	N	Ing		1.56E+04	N	Ing	
FORMIC ACID	64186	7.30E+04	N		4.08E+05	N	Ing		1.56E+05	N	Ing	
FURAN	110009	6.08E+00	N		2.04E+03	N	Ing		7.82E+01	N	Ing	
FURAZOLIDONE	67458	1.76E-02	C		1.51E+00	C	Ing		1.68E-01	C	Ing	
FURFURAL	98011	1.10E+02	N		6.13E+03	N	Ing		2.35E+02	N	Ing	
GLYCIDALDEHYDE	765344	1.46E+01	N		8.17E+02	N	Ing		3.13E+01	N	Ing	
GLYPHOSATE	1071836	7.00E+02		MCL	2.04E+05	N	Ing		7.82E+03	N	Ing	
HEPTACHLOR	76448	4.00E-01		MCL	1.95E-01	C	Inh	1	1.27E-01	C	Inh	1
HEPTACHLOR EPOXIDE	1024573	2.00E-01		MCL	6.29E-01	C	Ing		7.02E-02	C	Ing	
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN (HpCDF)	67562394	4.46E-05	C		3.82E-03	C	Ing		4.26E-04	C	Ing	
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN (HpCDF)	55673897	4.46E-05	C		3.82E-03	C	Ing		4.26E-04	C	Ing	
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN (HpCDD)	35822469	4.46E-05	C		3.82E-03	C	Ing		4.26E-04	C	Ing	
HEXABROMOBENZENE	87821	7.30E+01	N		4.08E+03	N	Ing		1.56E+02	N	Ing	
HEXACHLOROBENZENE	118741	1.00E+00		MCL	1.65E+00	C	Inh	1	3.99E-01	C	Ing	
HEXACHLOROBUTADIENE	87683	8.59E-01	C	R	1.35E-01	C	Inh	1	8.82E-02	C	Inh	1
ALPHA-HCH	319846	1.06E-02	C	R	9.08E-01	C	Ing		1.01E-01	C	Ing	
BETA-HCH	319857	3.72E-02	C	R	3.18E+00	C	Ing		3.55E-01	C	Ing	
GAMMA-HCH (LINDANE)	58899	2.00E-01		MCL	4.40E+00	C	Ing		4.91E-01	C	Ing	
TECHNICAL HCH	608731	3.72E-02	C		3.18E+00	C	Ing		3.55E-01	C	Ing	

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater			Soil							
					Restricted				Unrestricted			
		ug/l	Notes		mg/kg	Notes			mg/kg	Notes		
HEXACHLOROCYCLOPENTADIENE	77474	5.00E+01		MCL	9.51E-01	N	Inh	1	9.51E-01	N	Inh	1
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN (HxCDF)	70648269	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN (HxCDF)	57117449	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN (HxCDF)	72918219	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN (HxCDF)	60851345	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN (HxCDD)	39227286	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN (HxCDD)	57653857	1.08E-05	C		9.23E-04	C	Ing		1.03E-04	C	Ing	
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN (HxCDD)	19408743	1.08E-05	C		9.23E-04	C	Ing		1.03E-04	C	Ing	
HEXACHLOROETHANE	67721	4.78E+00	C	R	9.33E+01	C	Inh	1	4.56E+01	C	Ing	
HEXACHLOROPHENE	70304	1.10E+01	N		6.13E+02	N	Ing		2.35E+01	N	Ing	
1,6-HEXAMETHYLENE DIISOCYANATE	822060	2.09E-02	N			C				N		
HEXANE	110543	3.50E+02	N	R	1.60E+00	N	Inh	1	1.60E+00	N	Inh	1
2-HEXANONE	591786	1.46E+03	N		8.18E+04	N	Ing		3.13E+03	N	Ing	
HEXAZINONE	51235042	1.20E+03	N		6.75E+04	N	Ing		2.58E+03	N	Ing	
HMX	2691410	1.83E+03	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
HYDRAZINE	302012	2.23E-02	C		1.91E+00	C	Ing		2.13E-01	C	Ing	
HYDROGEN CYANIDE	74908	6.22E+00	N		4.09E+04	N	Ing		1.56E+03	N	Ing	
HYDROGEN SULFIDE	7783064	1.10E+02	N		6.13E+03	N	Ing		2.35E+02	N	Ing	
HYDROQUINONE	123319	1.46E+03	N		8.17E+04	N	Ing		3.13E+03	N	Ing	
INDENO[1,2,3-C,D]PYRENE	193395	9.17E-02	C	R	7.84E+00	C	Ing		8.75E-01	C	Ing	
IRON	7439896	1.10E+04	N		6.13E+05	N	Ing		2.35E+04	N	Ing	
ISOBUTANOL	78831	1.83E+03	N		6.13E+05	N	Ing		2.35E+04	N	Ing	
ISOPHORONE	78591	7.05E+01	C	R	4.57E+03		Csat		6.72E+02	C	Ing	
ISOPROPALIN	33820530	5.48E+02	N		3.06E+04	N	Ing		1.17E+03	N	Ing	
ISOPROPYL BENZENE (CUMENE)	98828	6.79E+02	N	R	9.43E+00	N	Inh	1	9.43E+00	N	Inh	1
ISOPROPYL METHYL PHOSPHONIC ACID	1832548	3.65E+03	N		2.04E+05	N	Ing		7.82E+03	N	Ing	
LEAD	7439921	1.50E+01		MCL	1.70E+03	C	Ing		4.00E+02	C	Ing	4
LEAD (TETRAETHYL LEAD)	78002	3.65E-03	N		2.04E-01	N	Ing		7.82E-03	N	Ing	
LINDANE (GAMMA-HCH)	58899	2.00E-01		MCL	4.40E+00	C	Ing		4.91E-01	C	Ing	
LITHIUM	7439932	7.30E+02	N		4.09E+04	N	Ing		1.56E+03	N	Ing	
MALATHION	121755	7.30E+02	N		4.08E+03	N	Ing		1.56E+03	N	Ing	
MALEIC ANHYDRIDE	108316	3.65E+03	N		2.04E+04	N	Ing		7.82E+03	N	Ing	
MANGANESE	7439965	7.30E+02	N		4.08E+03	N	Ing		1.56E+03	N	Ing	5
MEPHOSFOLAN	950107	3.29E+00	N		1.84E+02	N	Ing		7.04E+00	N	Ing	
MEPIQUAT CHLORIDE	24307264	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
MERCURIC CHLORIDE	7487947	1.10E+01	N		6.13E+01	N	Ing		2.35E+01	N	Ing	
MERCURY (INORGANIC)	7439976	2.00E+00		MCL	6.13E+01	N	Ing		1.00E+01	N	Inh	2
METHYLMERCURY	22967926	3.65E+00	N		2.04E+02	N	Ing		7.82E+00	N	Ing	
METHACRYLONITRILE	126987	1.04E+00	N		2.04E+02	N	Ing		7.82E+00	N	Ing	
METHANE TRICHLORIDE (CHLOROFORM)	67663	#VALUE!	C	R	4.78E-01	C	Inh	1	3.12E-01	C	Inh	1
METHANOL	67561	1.83E+04	N		1.02E+06	N	Ing		3.91E+04	N	Ing	
METHIDATHION	950378	3.65E+01	N		2.04E+03	N	Ing		7.82E+01	N	Ing	
METHOXYCHLOR	72435	4.00E+01		MCL	1.02E+03	N	Ing		3.91E+02	N	Ing	
METHYL ACETATE	79209	6.08E+03	N		2.04E+06	N	Ing		7.82E+04	N	Ing	
METHYL ACRYLATE	96333	1.83E+02	N		6.13E+03	N	Ing		2.35E+03	N	Ing	
METHYL BROMIDE (BROMOMETHANE)	74839	8.52E+00	N	R	2.97E+00	N	Inh	1	2.97E+00	N	Inh	1
METHYL CHLORIDE (CHLOROMETHANE)	74873	1.43E+00	C		4.40E+02	C	Ing		4.91E+01	C	Ing	
2-METHYLANILINE	95534	2.79E-01	C		2.38E+01	C	Ing		2.66E+00	C	Ing	
4-(2-METHYL-4-CHLOROPHENOXY) BUTYRIC ACID	94815	3.65E+02	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
2-METHYL-4-CHLOROPHENOXYACETIC ACID (MCPA)	94746	1.83E+01	N		1.02E+03	N	Ing		3.91E+01	N	Ing	
2-(2-METHYL-4-CHLOROPHENOXY)PROPIONIC ACID (MCPP)	93652	3.65E+01	N		2.04E+03	N	Ing		7.82E+01	N	Ing	
METHYLENE BROMIDE (DIBROMOMETHANE)	74953	6.08E+01	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
METHYLENE CHLORIDE (DICHLOROMETHANE)	75092	5.00E+00		MCL	2.19E+01	C	Inh	1	1.43E+01	C	Inh	1
4,4'-METHYLENE BIS(2-CHLOROANILINE)	101144	5.15E-01	C		4.40E+01	C	Ing		4.91E+00	C	Ing	
4,4'-METHYLENE BIS(N,N'-DIMETHYL)ANILINE	101611	1.46E+00	C		1.24E+02	C	Ing		1.39E+01	C	Ing	
METHYL ETHYL KETONE (2-BUTANONE)	78933	1.91E+03	N	R	8.45E+01	N	Inh	1	8.45E+01	N	Inh	1
METHYL HYDRAZINE	60344	6.09E-02	C		5.20E+00	C	Ing		5.81E-01	C	Ing	
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	108101	1.39E+02	N		1.63E+05	N	Ing		6.26E+03	N	Ing	
METHYL METHACRYLATE	80626	1.42E+03	N		1.63E+04	N	Ing		1.63E+04	N	Ing	
2-METHYLNAPHTHALENE	91576	1.22E+02	N		4.09E+04	N	Ing		1.56E+03	N	Ing	
2-METHYL-5-NITROANILINE	99558	2.03E+00	C		1.73E+02	C	Ing		1.94E+01	C	Ing	
METHYL PARATHION	298000	9.13E+00	N		4.08E+02	N	Ing		1.96E+01	N	Ing	
2-METHYLPHENOL (o-CRESOL)	95487	1.83E+03	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
3-METHYLPHENOL (m-CRESOL)	108394	1.83E+03	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
4-METHYLPHENOL (p-CRESOL)	106445	1.83E+02	N		1.02E+04	N	Ing		3.91E+02	N	Ing	
METHYLSTYRENE MIX	25013154	5.48E+01	N		1.23E+03	N	Ing		4.69E+02	N	Ing	
ALPHA-METHYLSTYRENE	98839	4.26E+02	N		1.43E+05	N	Ing		5.48E+03	N	Ing	
METHYL TERT BUTYL ETHER (MTBE)	1634044	4.00E+01		H	8.74E+03		Csat		3.91E+03	N	Ing	
METHYL TRIBROMIDE (BROMOFORM)	75252	8.48E+00	C	R	9.01E+01	C	Inh	1	5.88E+01	C	Inh	1

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater			Soil							
					Restricted				Unrestricted			
		ug/l	Notes		mg/kg	Notes			mg/kg	Notes		
METOLACHLOR (DUAL)	51218452	5.48E+03	N		3.06E+04	N	Ing		1.17E+04	N	Ing	
MIREX	2385855	7.30E+00	N		4.08E+01	N	Ing		1.56E+01	N	Ing	
MOLYBDENUM	7439987	1.83E+02	N		1.02E+03	N	Ing		3.91E+02	N	Ing	
MONOCHLORAMINE	10599903	3.65E+03	N		2.04E+04	N	Ing		7.82E+03	N	Ing	
MONOCHLOROBENZENE (CHLOROBENZENE)	108907	1.00E+02		MCL	1.19E+00	N	Inh	1	1.19E+00	N	Inh	1
NALED	300765	7.30E+01	N		4.09E+03	N	Ing		1.56E+02	N	Ing	
NAPHTHALENE	91203	6.20E+00	N	R	2.47E+02	N	Inh	1	1.94E+02	N	Inh	1
NICKEL	7440020	7.30E+02	N		4.08E+03	N	Ing	6	1.56E+03	N	Ing	6
NITRATE	14797558	1.00E+04		MCL	3.27E+05	N	Ing		1.25E+05	N	Ing	
NITRIC OXIDE	10102439	6.08E+02	N		2.04E+05	N	Ing		7.82E+03	N	Ing	
NITRITE	14797650	1.00E+03		MCL	2.04E+04	N	Ing		7.82E+03	N	Ing	
2-NITROANILINE	88744	4.17E-01	N	R	4.92E-01	N	Inh	1	4.92E-01	N	Inh	1
NITROBENZENE	98953	3.53E+00	N	R	8.41E+00	N	Inh	1	8.41E+00	N	Inh	1
NITROFURANTOIN	67209	2.56E+03	N		1.43E+05	N	Ing		5.48E+03	N	Ing	
NITROFURAZONE	59870	4.46E-02	C		3.82E+00	C	Ing		4.26E-01	C	Ing	
NITROGEN DIOXIDE	10102440	6.08E+03	N		2.04E+06	N	Ing		7.82E+04	N	Ing	
NITROGLYCERIN	55630	4.78E+00	C		4.09E+02	C	Ing		4.56E+01	C	Ing	
2-NITROPHENOL	88755	4.16E-01	N	R								
4-NITROPHENOL	100027	2.92E+02	N		1.64E+04	N	Ing		6.26E+02	N	Ing	
2-NITROPROPANE	79469	1.33E-03	C	R	2.38E-02	C	Inh	1	1.55E-02	C	Inh	1
N-NITROSO-DI-N-BUTYLAMINE	924163	1.89E-03	C		1.06E+00	C	Ing		1.18E-01	C	Ing	
N-NITROSODIETHANOLAMINE	1116547	2.39E-02	C		2.04E+00	C	Ing		2.28E-01	C	Ing	
N-NITROSODIETHYLAMINE	55185	4.46E-04	C		3.82E-02	C	Ing		4.26E-03	C	Ing	
N-NITROSODIMETHYLAMINE	62759	1.31E-03	C		1.12E-01	C	Ing		1.25E-02	C	Ing	
N-NITROSODIPHENYLAMINE	86306	1.37E+01	C	R	1.17E+03	C	Ing		1.30E+02	C	Ing	
N-NITROSODIPROPYLAMINE	621647	9.57E-03	C	R	8.18E-01	C	Ing		9.12E-02	C	Ing	
N-NITROSO-N-ETHYLUREA	759739	4.78E-04	C		4.09E-02	C	Ing		4.56E-03	C	Ing	
N-NITROSO-N-METHYLETHYLAMINE	10595956	3.04E-03	C		2.60E-01	C	Ing		2.90E-02	C	Ing	
N-NITROSOPYRROLIDINE	930552	3.19E-02	C		2.73E+00	C	Ing		3.04E-01	C	Ing	
M-NITROTOLUENE	99081	6.08E+01	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
O-NITROTOLUENE	88722	6.08E+01	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
P-NITROTOLUENE	99990	6.08E+01	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
NUSTAR	85509199	2.56E+01	N		1.43E+03	N	Ing		5.48E+01	N	Ing	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN (OCDF)	39001020	4.46E-04	C		3.82E-02	C	Ing		4.26E-03	C	Ing	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN (OCDD)	3268879	4.46E-04	C		3.82E-02	C	Ing		4.26E-03	C	Ing	
ORYZALIN	19044883	1.83E+03	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
OXADIAZON	19666309	1.83E+02	N		1.02E+04	N	Ing		3.91E+02	N	Ing	
OXAMYL	23135220	2.00E+02		MCL	5.11E+04	N	Ing		1.96E+03	N	Ing	
OXYFLUORFEN	42874033	1.10E+02	N		6.13E+03	N	Ing		2.35E+02	N	Ing	
PARAQUAT DICHLORIDE	1910425	1.64E+02	N		9.20E+03	N	Ing		3.52E+02	N	Ing	
PARATHION	56382	2.19E+02	N		1.23E+03	N	Ing		4.69E+02	N	Ing	
PENTACHLOROBENZENE	608935	2.92E+01	N		1.63E+03	N	Ing		6.26E+01	N	Ing	
1,2,3,7,8-PENTACHLORODIBENZOFURAN (PeCDF)	57117416	8.93E-06	C		7.63E-04	C	Ing		8.52E-05	C	Ing	
2,3,4,7,8-PENTACHLORODIBENZOFURAN (PeCDF)	57117314	8.93E-07	C		7.63E-05	C	Ing		8.52E-06	C	Ing	
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN (PeCDD)	40321764	8.93E-07	C		7.63E-05	C	Ing		8.52E-06	C	Ing	
PENTACHLORONITROBENZENE	82688	2.58E-01	C		2.20E+01	C	Ing		2.46E+00	C	Ing	
PENTACHLOROPHENOL	87865	1.00E+00		MCL	2.38E+01	N	Ing	7	2.66E+00	C	Ing	7
PERCHLOROETHENE (TETRACHLOROETHENE) (PCE)	127184	5.00E+00		MCL	1.82E+01	C	Inh	1	1.19E+01	C	Inh	1
PERMETHRIN	52645531	1.83E+03	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
PHENANTHRENE	85018	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
PHENOL	108952	2.19E+04	N	R	1.23E+05	N	Ing		4.69E+04	N	Ing	
M-PHENYLENEDIAMINE	108452	2.19E+02	N		1.23E+04	N	Ing		4.69E+02	N	Ing	
O-PHENYLENEDIAMINE	95545	1.42E+00	C		1.22E+02	C	Ing		1.36E+01	C	Ing	
P-PHENYLENEDIAMINE	106503	6.94E+03	N		3.88E+05	N	Ing		1.49E+04	N	Ing	
2-PHENYLPHENOL	90437	3.45E+01	C		2.95E+03	C	Ing		3.29E+02	C	Ing	
PHOSPHINE	7803512	5.92E-01	N		6.13E+01	N	Ing		2.35E+01	N	Ing	
PHOSPHORIC ACID	7664382	2.09E+01	N		5.72E+34	C	Ing		6.39E+33	C	Ing	
PHOSPHORUS (WHITE)	7723140	7.30E-01	N		4.09E+01	N	Ing		1.56E+00	N	Ing	
P-PHTHALIC ACID	100210	3.65E+04	N		2.04E+05	N	Ing		7.82E+04	N	Ing	
PHTHALIC ANHYDRIDE	85449	7.30E+04	N		4.08E+05	N	Ing		1.56E+05	N	Ing	
POLYBROMINATED BIPHENYLS (PBBs)		7.52E-03	C		6.43E-01	C	Ing		7.18E-02	C	Ing	
POLYCHLORINATED BIPHENYLS (PCBs)	1336363	5.00E-01		MCL	1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1016	12674112	9.57E-01	C		1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1221	11104282	3.35E-02	C		1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1232	11141165	3.35E-02	C		1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1242	53469219	3.35E-02	C		1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1248	12672296	3.35E-02	C		1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1254	11097691	3.35E-02	C		1.00E+01	C		9	1.00E+00	C		8
AROCLOR-1260	11096825	3.35E-02	C		1.00E+01	C		9	1.00E+00	C		8
POLYCHLORINATED TERPHENYLS	61788338	1.49E-02	C		1.27E+00	C	Ing		1.42E-01	C	Ing	

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater			Soil							
					Restricted				Unrestricted			
		ug/l	Notes		mg/kg	Notes			mg/kg	Notes		
POLYNUCLEAR AROMATIC HYDROCARBONS:												
ACENAPHTHENE	83329	3.65E+02	N	R	1.23E+05	N	Ing		4.69E+03	N	Ing	
ACENAPHTHYLENE	208968	2.19E+03	N		1.23E+05	N	Ing		4.69E+03	N	Ing	
ANTHRACENE	120127	4.34E+01		Csol	6.13E+05	N	Ing		2.35E+04	N	Ing	
BENZ[A]ANTHRACENE	56553	9.17E-02	C	R	7.84E+00	C	Ing		8.75E-01	C	Ing	
BENZO[A]PYRENE	50328	2.00E-01		MCL	7.84E-01	C	Ing		8.75E-02	C	Ing	
BENZO[B]FLUORANTHENE	205992	9.17E-02	C	R	7.84E+00	C	Ing		8.75E-01	C	Ing	
BENZO[G,H,I]PERYLENE	191242	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
BENZO[K]FLUORANTHENE	207089	9.17E-01	C	R	7.84E+01	C	Ing		8.75E+00	C	Ing	
CHRYSENE	218019	9.17E+00	C	R	7.84E+02	C	Ing		8.75E+01	C	Ing	
DIBENZ[A,H]ANTHRACENE	53703	9.17E-03	C	R	7.84E-01	C	Ing		8.75E-02	C	Ing	
FLUORANTHENE	206440	1.46E+03	N	R	8.17E+04	N	Ing		3.13E+03	N	Ing	
FLUORENE	86737	2.43E+02	N	R	8.17E+04	N	Ing		3.13E+03	N	Ing	
INDENO[1,2,3-C,D]PYRENE	193395	9.17E-02	C	R	7.84E+00	C	Ing		8.75E-01	C	Ing	
2-METHYLNAPHTHALENE	91576	1.22E+02	N		4.09E+04	N	Ing		1.56E+03	N	Ing	
NAPHTHALENE	91203	6.20E+00	N	R	2.47E+02	N	Inh	1	1.94E+02	N	Inh	1
PHENANTHRENE	85018	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
PYRENE	129000	1.83E+02	N	R	6.13E+04	N	Ing		2.35E+03	N	Ing	
POTASSIUM CYANIDE	151508	1.83E+03	N		1.02E+04	N	Ing		3.91E+03	N	Ing	
POTASSIUM SILVER CYANIDE	506616	7.30E+03	N		4.08E+04	N	Ing		1.56E+04	N	Ing	
PROMETON	1610180	5.48E+02	N		3.07E+04	N	Ing		1.17E+03	N	Ing	
PROMETRYN	7287196	1.46E+02	N		8.18E+03	N	Ing		3.13E+02	N	Ing	
PROPACHLOR	1918167	4.75E+02	N		2.65E+04	N	Ing		1.02E+03	N	Ing	
PROPANIL	709988	1.83E+02	N		1.02E+04	N	Ing		3.91E+02	N	Ing	
PROPARGITE	2312358	7.30E+02	N		4.09E+04	N	Ing		1.56E+03	N	Ing	
N-PROPYLBENZENE	103651	2.43E+02	N	R	4.90E+02		Csat		4.90E+02		Csat	
PROPYLENE GLYCOL	57556	7.30E+05	N		6.13E+06	N	Ing		1.56E+06	N	Ing	
PROPYLENE GLYCOL, MONOETHYL ETHER	52125538	2.56E+04	N		1.43E+06	N	Ing		5.48E+04	N	Ing	
PROPYLENE GLYCOL, MONOMETHYL ETHER	107982	2.56E+04	N		1.43E+06	N	Ing		5.48E+04	N	Ing	
PURSUIT	81335775	9.13E+03	N		5.11E+05	N	Ing		1.96E+04	N	Ing	
PYRENE	129000	1.83E+02	N	R	6.13E+04	N	Ing		2.35E+03	N	Ing	
PYRIDINE	110861	3.65E+01	N		2.04E+03	N	Ing		7.82E+01	N	Ing	
QUINOLINE	91225	5.58E-03	C		4.77E-01	C	Ing		5.32E-02	C	Ing	
RDX (CYCLONITE)	121824	6.09E-01	C		5.20E+01	C	Ing		5.81E+00	C	Ing	
RESMETHRIN	10453868	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
RONNEL	299843	1.83E+03	N		1.02E+04	N	Ing		3.91E+03	N	Ing	
ROTENONE	83794	1.46E+02	N		8.18E+03	N	Ing		3.13E+02	N	Ing	
SELENIOUS ACID	7783008	1.83E+02	N		1.02E+03	N	Ing		3.91E+02	N	Ing	
SELENIUM	7782492	5.00E+01		MCL	1.02E+03	N	Ing		3.91E+02	N	Ing	
SILVER	7440224	1.83E+02	N	MCL	1.02E+03	N	Ing		3.91E+02	N	Ing	
SILVER CYANIDE	506649	3.65E+03	N		2.04E+04	N	Ing		7.82E+03	N	Ing	
SIMAZINE	122349	4.00E+00		MCL	4.77E+01	C	Ing		5.32E+00	C	Ing	
SODIUM AZIDE	26628228	1.46E+02	N		8.18E+03	N	Ing		3.13E+02	N	Ing	
SODIUM DIETHYLDITHIOCARBAMATE	148185	2.48E-01	C		2.12E+01	C	Ing		2.37E+00	C	Ing	
SODIUM CYANIDE	143339	1.46E+03	N		8.17E+03	N	Ing		3.13E+03	N	Ing	
STRONTIUM, STABLE	7440246	2.19E+04	N		1.23E+05	N	Ing		4.69E+04	N	Ing	
STRYCHNINE	57249	1.10E+01	N		6.13E+02	N	Ing		2.35E+01	N	Ing	
STYRENE	100425	1.00E+02		MCL	3.84E+02	N	Inh	1	3.84E+02	N	Inh	1
2,3,7,8-TETRACHLORODIBENZOFURAN (TCDF)	51207319	4.46E-06	C		3.82E-04	C	Ing		4.26E-05	C	Ing	
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)	1746016	3.00E-05		MCL	3.82E-05	C	Ing		4.26E-06	C	Ing	
1,2,4,5-TETRACHLOROBENZENE	95943	1.10E+01	N		6.13E+02	N	Ing		2.35E+01	N	Ing	
1,1,1,2-TETRACHLOROETHANE	630206	4.06E-01	C		2.20E+02	C	Ing		2.46E+01	C	Ing	
1,1,2,2-TETRACHLOROETHANE	79345	5.27E-02	C	R	1.00E+00	C	Inh	1	6.56E-01	C	Inh	1
TETRACHLOROETHENE (PERCHLOROETHENE) (PCE)	127184	5.00E+00		MCL	1.82E+01	C	Inh	1	1.19E+01	C	Inh	1
2,3,4,6-TETRACHLOROPHENOL	58902	1.10E+03	N		6.13E+04	N	Ing		2.35E+03	N	Ing	
P,A,A,A-TETRACHLOROTOLUENE	5216251	2.18E-03	C		2.86E-01	C	Ing		3.19E-02	C	Ing	
TETRAETHYL LEAD	78002	3.65E-03	N		2.04E-01	N	Ing		7.82E-03	N	Ing	
1,1,1,2-TETRAFLUOROETHANE	811972	1.67E+05	N									
TETRYL	479458	3.65E+02	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
THALLIC OXIDE	1314325	2.56E+00	N		1.43E+02	N	Ing		5.48E+00	N	Ing	
THALLIUM	7440280	2.00E+00		MCL	1.43E+02	N	Ing		5.48E+00	N	Ing	
THALLIUM ACETATE	563688	2.00E+00		MCL	1.84E+02	N	Ing		7.04E+00	N	Ing	
THALLIUM CARBONATE	6533739	2.00E+00		MCL	1.63E+02	N	Ing		6.26E+00	N	Ing	
THALLIUM CHLORIDE	7791120	2.00E+00		MCL	1.63E+02	N	Ing		6.26E+00	N	Ing	
THALLIUM NITRATE	10102451	2.00E+00		MCL	1.84E+02	N	Ing		7.04E+00	N	Ing	
THALLIUM SULFATE (2:1)	7446186	2.00E+00		MCL	1.63E+02	N	Ing		6.26E+00	N	Ing	
THIOBENCARB	28249776	3.65E+02	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
THIOCYANATE		1.83E+03	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
TIN	7440315	2.19E+04	N		1.23E+05	N	Ing		4.69E+04	N	Ing	
TITANIUM	7440326	1.46E+05	N		8.18E+06	N	Ing		3.13E+05	N	Ing	

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
TIER 1 TRG TABLE

CHEMICAL	CAS No.	Groundwater			Soil							
					Restricted				Unrestricted			
		ug/l	Notes		mg/kg	Notes			mg/kg	Notes		
TITANIUM DIOXIDE	13463677	1.46E+05	N		8.18E+06	N	Ing		3.13E+05	N	Ing	
TOLUENE	108883	1.00E+03		MCL	3.80E+01	N	Inh	1	3.80E+01	N	Inh	1
TOLUENE-2,4-DIAMINE	95807	2.09E-02	C		1.79E+00	C	Ing		2.00E-01	C	Ing	
TOLUENE-2,5-DIAMINE	95705	2.19E+04	N		1.23E+05	N	Ing		4.69E+04	N	Ing	
TOLUENE-2,6-DIAMINE	823405	7.30E+03	N		4.08E+04	N	Ing		1.56E+04	N	Ing	
P-TOLUIDINE	106490	3.52E-01	C		3.01E+01	C	Ing		3.36E+00	C	Ing	
TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE ORGANICS (TPH-GRO)		3.50E+02	N	R	3.00E+02	N	Inh	1	2.00E+02	N	Inh	1
TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE ORGANICS (TPH-DRO)		6.50E+02	N	R	3.50E+02		Csat		3.00E+02	N	Inh	1
TOXAPHENE	8001352	3.00E+00		MCL	5.20E+00	C	Ing		5.81E-01	C	Ing	
1,2,4-TRIBROMOBENZENE	615543	1.83E+02	N		1.02E+04	N	Ing		3.91E+02	N	Ing	
TRIBUTYLTIN OXIDE	56359	1.10E+01	N		6.13E+02	N	Ing		2.35E+01	N	Ing	
2,4,6-TRICHLOROANILINE	634935	1.97E+00	C		1.68E+02	C	Ing		1.88E+01	C	Ing	
1,2,4-TRICHLOROBENZENE	120821	7.00E+01		MCL	8.24E+02	N	Inh	1	7.82E+02	N	Ing	
1,1,1-TRICHLOROETHANE	71556	2.00E+02		MCL	1.19E+03		Csat		1.19E+03		Csat	
1,1,2-TRICHLOROETHANE	79005	5.00E+00		MCL	1.67E+00	C	Inh	1	1.09E+00	C	Inh	1
TRICHLOROETHENE (TCE)	79016	5.00E+00		MCL	7.92E+00	C	Inh	1	5.17E+00	C	Inh	1
TRICHLOROFLUOROMETHANE	75694	1.29E+03	N		1.43E+05	N	Ing		2.35E+04	N	Ing	
2,4,5-TRICHLOROPHENOL	95954	3.65E+03	N	R	2.04E+05	N	Ing		7.82E+03	N	Ing	
2,4,6-TRICHLOROPHENOL	88062	6.09E+00	C	R	3.14E+02	C	Inh	1	5.81E+01	C	Ing	
2,4,5-TRICHLOROPHENOXYACETIC ACID (2,4,5-T)	93765	3.65E+02	N		2.04E+04	N	Ing		7.82E+02	N	Ing	
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID (2,4,5-TP SILVEX)	93721	5.00E+01		MCL	1.63E+03	N	Ing		6.26E+02	N	Ing	
1,1,2-TRICHLOROPROPANE	598776	3.04E+01	N		1.02E+04	N	Ing		3.91E+02	N	Ing	
1,2,3-TRICHLOROPROPANE	96184	6.23E-03	C		8.18E-01	C	Ing		9.12E-02	C	Ing	
1,2,3-TRICHLOROPROPENE	96195	3.04E+01	N		1.02E+03	N	Ing		3.91E+02	N	Ing	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76131	5.94E+04	N		6.13E+05	N	Ing		6.13E+05	N	Ing	
1,2,4-TRIMETHYLBENZENE	95636	1.23E+01	N		1.02E+05	N	Ing		3.91E+03	N	Ing	
1,3,5-TRIMETHYLBENZENE	108678	1.23E+01	N	R	4.36E+02		Csat		4.36E+02		Csat	
TRIMETHYL PHOSPHATE	512561	1.81E+00	C		1.55E+02	C	Ing		1.73E+01	C	Ing	
1,3,5-TRINITROBENZENE	99354	1.10E+03	N		1.02E+02	N	Ing		1.02E+02	N	Ing	
2,4,6-TRINITROTOLUENE	118967	2.23E+00	C		1.02E+02	N	Ing		2.13E+01	C	Ing	
URANIUM (SOLUBLE SALTS)		1.10E+02	N		6.13E+03	N	Ing		2.35E+02	N	Ing	
VANADIUM	7440622	2.56E+02	N		1.43E+03	N	Ing		5.48E+02	N	Ing	
VANADIUM PENTOXIDE	1314621	3.29E+02	N		1.84E+03	N	Ing		7.04E+02	N	Ing	
VANADIUM SULFATE	16785812	7.30E+02	N		4.08E+03	N	Ing		1.56E+03	N	Ing	
VINCLOZOLIN	50471448	9.13E+02	N		5.11E+04	N	Ing		1.96E+03	N	Ing	
VINYL ACETATE	108054	4.12E+02	N	R	9.13E+00	N	Inh	1	9.13E+00	N	Inh	1
VINYL BROMIDE (BROMOETHENE)	593602	1.12E-01	C	R	1.26E-01	N	Inh	1	1.26E-01	N	Inh	1
VINYL CHLORIDE (CHLOROETHENE)	75014	2.00E+00		MCL	9.39E-01	C	Inh	1	4.26E-01	C	Ing	
WARFARIN	81812	1.10E+01	N		6.13E+01	N	Ing		2.35E+01	N	Ing	
M-XYLENE	108383	1.22E+04	N	R	4.18E+02		Csat		4.18E+02		Csat	
O-XYLENE	95476	1.22E+04	N	R	4.13E+02		Csat		4.13E+02		Csat	
P-XYLENE	106423	1.22E+04	N	R	4.61E+02		Csat		4.61E+02		Csat	
XYLENES	1330207	1.00E+04		MCL	3.18E+02		Csat		3.18E+02		Csat	
ZINC	7440666	1.10E+04	N		6.13E+04	N	Ing		2.35E+04	N	Ing	
ZINC CYANIDE	557211	1.83E+03	N		1.02E+04	N	Ing		3.91E+03	N	Ing	
ZINC PHOSPHIDE	1314847	1.10E+01	N		6.13E+02	N	Ing		2.35E+01	N	Ing	
ZINEB	12122677	1.83E+03	N		1.02E+04	N	Ing		3.91E+03	N	Ing	

NOTES:
C = Carcinogenic effects as to the identification of appropriate TRG
N = Noncarcinogenic effects as to the identification of appropriate TRG
H = EPA Health Advisory
Csat = Soil Saturation Concentration
Csol = Aqueous Solubility Concentration - For mixtures of chemicals (e.g., gasoline, diesel, etc.) the EFFECTIVE Solubility should be used.
MCL = Maximum Contaminant Level from Safe Drinking Water Act
R = Risk-based value utilizing equations developed by EPA Region III for its RBC Table.
1 = Inhalation values apply to ambient air volatilization only. Enclosed space accumulation is not addressed in the Inhalation TRGs. For such scenarios, a site-specific evaluation is required.
2 = Inhalation values apply to ambient fugitive particulates only.
3 = If both the 2,4- and 2,6- isomers of 2,4-Dinitrotoluene are detected at a site, then the TRG for Dinitrotoluene Mixture must be met. If only one or the other isomer is detected, then the isomer specific value can be applied.
4 = According to "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities," OSWER Directive #9355.4-12, July 14, 1994, Laws EP.
5 = The reference dose is for the total oral intake of manganese. As discussed in the Principal and Supporting Studies and Uncertainty and Modifying Factors Sections of IRIS, it is recommended that a modifying factor of 3 be applied.
6 = The inhalation exposure is from nickel refinery dust.
7 = For Pentachlorophenol, the Ingestion value has been divided in half to account for increased exposure via the dermal route.
8 = According to EPA's Federal Register June 29, 1998, "Mega Rule," PCBs (total) must not exceed 1 ppm. If PCB concentrations are reported as individual Aroclors, the sum of the individual Aroclors must not exceed 1 ppm.
9 = According to EPA's Federal Register June 29, 1998, "Mega Rule," PCBs (total) must not exceed 10 ppm provided BOTH institutional and engineering controls are in place for a high occupancy site. Concentrations above the restricted level require a Tier 2 Risk Evaluation and the use of low occupancy criteria must be approved by MDEQ. All institutional and engineering controls must be consistent with the EPA "Mega Rule." If PCB concentrations are reported as individual Aroclors, the sum of the individual Aroclors must not exceed 10 ppm.

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

APPENDIX B

PETROLEUM HYDROCARBON TABLES

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

TABLE 1

PETROLEUM HYDROCARBON INDICATOR COMPOUNDS[1]

Type of Release								
Indicator Compound	Gasoline	Kerosene, Jet Fuel	Diesel, Light Fuel Oils	Heavy Fuel Oils	Crude Oil	Highly Refined Base Oils[2]	Used Motor Oil, Lubricating Oil	Unknown
TPH-GRO	X	X						X
TPH-DRO		X	X	X	X	X	X	X
Volatiles	X	X						X
Acenaphthene		X	X	X	X	X	X	X
Acenaphthylene		X	X	X	X	X	X	X
Anthracene		X	X	X	X	X	X	X
Benz[a]anthracene		X	X	X	X	X	X	X
Benzo[a]pyrene		X	X	X	X	X	X	X
Benzo[b]fluoranthene		X	X	X	X	X	X	X
Benzo[g,h,i]perylene		X	X	X	X	X	X	X
Benzo(k)fluoranthene		X	X	X	X	X	X	X
Chrysene		X	X	X	X	X	X	X
Fluoranthene		X	X	X	X	X	X	X
Fluorene		X	X	X	X	X	X	X
Indeno[1,2,3-c,d]pyrene		X	X	X	X	X	X	X
2-Methylnaphthalene		X	X	X	X	X	X	X
Naphthalene		X	X	X	X	X	X	X
Phenanthrene		X	X	X	X	X	X	X
Pyrene		X	X	X	X	X	X	X
Metals							X	X
Methyl tertbutyl ether	X							X
Methyl ethyl ketone	X[3]							X
Methyl isobutyl ketone	X[3]							X

NOTES:

1 ASTM 1995 and TPH Criteria Working Group; for large releases additional indicator constituents may be identified for evaluation.

2 Applies to oils formulated with highly refined base oils including hydraulic fluids (Mineral-oil based hydraulic fluids, Toxicological Profile for Mineral Oil Hydraulic Fluids, Organophosphate Ester Hydraulic Fluids, and Polyalphaolefin Hydraulic Fluids, ATSDR 1994), motor oils, industrial oils, and automatic transmission fluid-type oils (i.e., severely refined base oils).

3 When suspected to be present.

TABLE 2

TIER 2 PETROLEUM HYDROCARBON TARGET REMEDIATION GOALS (TRGS)

Carbon Fraction	Method	Groundwater (μg/L)	Soils Unrestricted (mg/kg)	Soils Restricted (mg/kg)
C_5-C_8	Aliphatic	400	100	500
C_9-C_{12}	Aliphatic	4,000	1,000	5,000
C_9-C_{10}	Aromatic	200	100	100
C_9-C_{18}	Aliphatic	200	100	5,000
C_{19}-C_{36}	Aliphatic	5,000	2,500	5,000
C_{11}-C_{22}	Aromatic	200	200	200

APPENDIX D

ECOLOGICAL CHECKLIST

THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
BROWNFIELD VOLUNTARY CLEANUP PROGRAM
ECOLOGICAL CHECKLIST

Section I- Facility Information

1. Name of Facility: _____
2. Location of Facility: _____
   County: _____
3. Mailing Address: _____
4. Type of Facility: _____
5. Describe land use at and in the vicinity of the release site _____

6. Attach a USGS topographic map of the facility and aerial and other photographs of the release site and surrounding areas.

Section 2-Surrounding Land Use Information

1. Describe land use adjacent to the facility.

2. Provide the following information regarding the nearest water body:
   Name of surface water body: _____
   Type of surface water body (pond, lake, river etc: _____
3. Do any potentially sensitive environmental areas exist adjacent to or in proximity to the site, e.g., Federal and State parks, National and State Monuments, wetlands, etc.

Section 3 - Release Information

1. Nature of release. _____
2. Location of the release (within the facility) _____
3. Location of the release with respect to the facility property boundaries:

4. Chemicals of Concern (COC) known or suspected to have been released: _____

5. Indicate which media are known or suspected to be impacted and if sampling data are available:

Soil 0-6 feet bgs	yes	no
groundwater	yes	no
surface water/sediment	yes	no

6. Has migration occurred outside the facility property boundaries? yes no
   If yes, describe the designated use of the land impacted: _____

Section 4 - Criteria for Further Assessment

If the Area of Impact (AOI) meets all of the criteria presented below, then typically no further ecological evaluation shall be required. If the AOI does not meet all of the criteria, then a screening level ecological risk shall be conducted. The Submitter should make the initial decision regarding whether or not a screening level ecological risk assessment is warranted based on compliance of the AOI with criteria listed below. After review of the ecological checklist and other available site information, the Mississippi Department of Environmental Quality will make a final determination on the need for a screening level ecological risk assessment. If site conditions at the AOI change such that one or more of the criteria are not met, then a screening level ecological risk assessment shall be conducted.

The criteria for exclusion from further ecological assessment include:

The area of impacted soil is approximately 1 acre or less in size;

There is no current (or potential) release (via runoff or groundwater discharge) of COCs from the AOI to a surface water body;

Recreational species, commercial species, threatened or endangered species, and/or their habitats are not currently being exposed, or expected to be exposed, to COCs present at or migrating from the AOI; and

There are no obvious impacts to ecological receptors or their habitats.

Section 5 - Site Summary

The ecological checklist submittal shall include a site summary which presents sufficient information to verify that the AOI meets or does not meet the criteria for further assessment.

Section 6 - Submitter Information

Date: _____

Name of person submitting this check list: _____

Affiliation: _____

Signature _____

Additional Preparers: _____