# THE RESIGHINI RANCHERIA
# TRIBAL WATER QUALITY ORDINANCE NUMBER O1-2002

**Revised March 31, 2006**

## By the Resighini Rancheria Environmental Protection Authority

Adopted October 15, 2002
Revised March 31, 2006
Revisions Adopted June 14, 2006
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**THE RESIGHINI RANCHERIA**
**TRIBAL WATER QUALITY ORDINANCE**

## Section 1 - Short Title, Findings and Purpose

**101** **Short Title:** This Ordinance shall be known as the **Tribal Water Quality Ordinance** of the Resighini Rancheria.

**102** **Findings:** The Business Council of the Resighini Rancheria hereby finds as follows:

(A) Since time immemorial, the Klamath River, Waukell Creek and the numerous other unnamed creeks, streams, ponds, springs and their tributary streams, the streambeds thereof and the riparian areas adjacent thereto, have been natural resources of profound significance to the Yurok People who have used these resources for cultural, ceremonial, religious, fishery, seasonal residential and other purposes fundamental to the Tribe's way of life.

(B) The members of the Resighini Rancheria have a primary interest in the protection, control and conservation of the water resources which flow into and through the Rancheria, and the quality of such waters must be protected to insure the health, economic, aesthetic and cultural well-being of the people of the Rancheria.

(C) Various sites along the waters of the Resighini Rancheria are or may be contaminated with toxic or hazardous materials as a result of previous land use activities, many of which were authorized without adequate review of impacts or without adequate disclosure to the Tribe of the potential for such impacts, and the contamination at these sites may pose significant risks to water quality and public health if not properly contained and cleaned up.

(D) The Business Council hereby finds that wellhead protection is a pro-active approach to managing public groundwater supplies focusing on preventing contaminants from entering recharge areas to public water supply well. Protecting wellheads involves: knowing the location and boundaries of the recharge area; identifying any potential sources of contamination in the recharge area; controlling those potential sources to prevent the release of contaminants; and, controlling future land use in the recharge area to prevent activities which are known to threaten groundwater quality.

(E) Pursuant to federal law as determined by the U.S. Supreme Court in such cases as *Montana v. United States*, 450 U.S. 544 (1981) and reaffirmed in *Strate v. A-1 Contractors* 117 S.Ct. 1404 (1997), the Resighini Rancheria possesses inherent sovereign authority to regulate on-Reservation pollution discharges that affect

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fundamental Tribal interests and public health and safety, including when such activities are conducted by non-members of the Tribe on privately owned land within the Reservation.

(F) Under 1988 amendments to the Clean Water Act, 33 U.S.C. 1377, Indian Tribes are entitled to be certified by the U.S. Environmental Protection Agency as authorized to exercise exclusive jurisdiction (Tribal primacy) over all on-Reservation surface and ground water quality matters, including over on-Reservation portions of waters, such as those of the Klamath River, Waukell Creek and all other waters of the Reservation that flow through other jurisdictions.

(G) Regulation or elimination of all discharges of pollutants into the waters of the Resighini Rancheria is necessary at this time in order to maintain the quality of those waters for their beneficial use by members of the Resighini Rancheria and residents of the Reservation.

**103 Purpose:** The purpose of this Ordinance is to exercise comprehensive Tribal regulatory authority over all surface and groundwater matters, and to protect fundamental Tribal cultural, ceremonial, religious, fishery, seasonal residential, public health and safety and water quality issues by ensuring adequate drinking water, protecting beneficial uses, prohibiting all point source discharges and restricting non-point source discharges of pollutants within the exterior boundaries of the Resighini Rancheria.

**104 Authority and Scope:**

Authority: This Tribal Water Quality Ordinance is hereby adopted by the Business Council pursuant to Article V, Section 3 of the Tribe's Constitution authorizing the Business Council to undertake such actions.

Scope: The provisions of this Ordinance shall apply to all existing and proposed point and non-point pollution discharges into surface or ground waters, and to all activities which have the potential to affect cultural, ceremonial, religious, fishery, seasonal residential, public health and safety, water quality and other fundamental interests of the Tribe, including such activities conducted by non-members of the tribe or on privately owned lands. Activities to be regulated hereunder include but are not limited to:

(A) Landfills and open dumps;

(B) Storage of animal waste;

(C) Automobile graveyards and junkyards;

(D) Land filling of sludge or septic system waste;

(E) Individual, residential, industrial, commercial or agricultural sewage treatment facilities;

(F) Individual, residential, industrial, commercial, fire protection or agricultural water control devices including but not limited to treatment facilities or systems, dams, reservoirs, ponds, pools, tanks, wells, pipelines, flumes, canals and intake or diversion systems;

(G) Underground and above-ground liquid storage containers;

(H) Surface and subsurface removal of mineral resources, overburden, rock or soil, including quarry operations (borrow pitting) for road surfacing or other uses;

(I) All prospecting activities involving removal of soil or rock materials, including operations involving the reopening of existing mine pits, tunnels or quarries;

(J) Sand and gravel operations;

(K) Activities such as suction dredging, that have the potential to affect the riparian area, water quality or channel morphology;

(L) Potential non-point source pollution problem areas including agricultural, mining, construction, urban runoff, silviculture, salt water intrusion, hydrological modification and residential activities;

(M) Application of herbicide, insecticide or other pesticide or toxic materials or fertilizer for non-domestic use.

The provision of this Ordinance shall apply to all wellhead protection areas within the exterior boundaries of the Reservation, to all persons and businesses on the Resighini Rancheria, to all land under the Tribe's jurisdiction, trust or fee, and to all activities in areas with the potential to affect water quality, public health and safety and other fundamental interests of the Tribe.

**105 Consensual Relations Among Non-members, the Tribe and Tribal Members:**

Any person who is not a member of the Tribe who uses land anywhere within the exterior boundaries of the Reservation or other lands under the Tribe's jurisdiction, whether trust or non-trust land, enters into consensual relationships with the Tribe or its members, through commercial

dealings, contracts leases or other arrangements. Such person's discharge of pollutants into or other activities which affect the water quality of surface or ground waters within the exterior boundaries of the Reservation will have demonstrably serious impact upon the environment, natural resources, public health and safety of the Tribe and its members, unless such use is in compliance with the provisions of this Ordinance and any regulations promulgated hereunder.

**Section 2 - Definitions**

For the purposes of this Ordinance, the following words and phrases shall have the following meanings:

**Aquifer:** means any geologic formation capable of yielding a significant amount of potentially recoverable water.

**Beneficial Uses**: All lawful uses of waters identified in the Tribe's water quality control plan. Uses may include but are not limited to domestic, commercial, industrial, agricultural, traditional, cultural and recreational, and uses by fish and wildlife for habitat or propagation.

**Business Council:** Governing body of the Resighini Rancheria.

**Designated Use:** A use that is specified in water quality standards as a goal for a water body segment, whether or not it is currently being attained.

**Existing uses:** All uses actually attained in the water body on or after the effective date of this Ordinance, whether or not they are explicitly stated as designated uses in the water quality standards or presently existing uses.

**Hazardous Materials:** 1) Any substance that poses a threat to human health or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive or chemically reactive. 2) Any substance named by the EPA to be reported, if a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted into the environment.

**Herbicide:** Any chemical compound designed to control or destroy plants, weeds or grasses.

**Historical Uses:** All uses that have historical significance for the Tribe, its people or its members.

**Insecticide:** Any compound designed or used to kill or control the growth of insects.

**Impervious Barrier:** Any material or structure on, above or below the ground that does not

allow precipitation or surface water to penetrate directly into the underlying surface.

**Mining:** Any activities designed for the extraction of minerals including rock, sand and gravel.

**Mitigation:** A measure taken to reduce adverse impacts on the environment.

**Nonpoint Source:** Any pollution sources which are diffuse and do not have a single point of origin or are not introduced into a receiving stream from a specific outlet.

**Person:** Any individual, corporation, partnership, association, agency, municipality, commission or department, including the Resighini Rancheria or other federally-recognized Tribal government.

**Pesticide:** Any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest. Also, any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant.

**Point source:** Any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, culvert, well, discrete fissures, containers, rolling stock, concentration animal feeding operation, vessel or other floating craft.

**Pollutant:** Any substance that will alter the quality of the waters of the Reservation.

**Potential Uses:** All uses attainable in the water body, whether or not they are explicitly stated as designated uses in the water quality standards or presently potential uses.

**Quality of the Water or Waters:** Any chemical, physical, biological, bacteriological, radiological and other properties and characteristics of water which affect its use.

**Reservation or Rancheria:** All land, air and water located within the exterior boundaries of the Resighini Rancheria, and all lands under the jurisdiction of the Resighini Rancheria.

**Riparian:** Refers to land on the banks of a body of water, such as a lake, pond, river or stream.

**Toxic Materials:** Any chemical or mixture that presents an unreasonable risk or injury to human health or the environment.

**Recharge Area:** Any area that collects precipitation or surface water and carries it to aquifers. Recharge areas may include areas designated as wellhead protection areas and

naturally occurring areas outside the exterior boundaries of the Reservation.

**Variance**: Authorized written permission for a delay or exception in the application of a given law, ordinance or regulation.

**Waste:** Waste water and any and all other substances, liquid, solid, gaseous, radioactive, heat laden, associated with human habitation, or of human or animal origin, or from any of man's activities including producing, manufacturing or processing operation of whatever nature, including such waste placed within containers of whatever nature prior to, and for purposes of, disposal.

**Reservation Waters or Waters of the Reservation:** Any water, surface or underground, contained within, flowing through or bordering upon the Resighini Rancheria or any portion thereof.

**Water Quality Criteria:** Specific levels of water quality which, if reached, are expected to render a body of water suitable for its beneficial use.

**Wellhead Protection Area:** The surface and subsurface area surrounding a water well or well field, supplying a domestic water system, through which contaminants are reasonably likely to move toward and reach such water well or well field.

**Section 3 – Resighini Rancheria Environmental Protection Authority**

**301 Designation as Lead Tribal Agency:** The Resighini Rancheria Environmental Protection Authority (REPA) shall be the lead agency for implementing this Tribal Water Quality Ordinance.

**302 Creation of Position of Tribal Water Quality Control Officer & Establishment of Riparian Review Committee:** There is hereby created the position of Tribal Water Quality Control Officer. The Tribal Water Quality Control Officer shall be the Director of the REPA, and shall serve under the direction of the President/Chairperson. The Tribal Water Quality Control Officer shall cooperate with the Riparian Review Committee, the U.S. EPA and other agencies of the federal government or the State of California, as necessary to carry out the intent of this Ordinance and to implement its provisions.

**303 Powers and Duties of Tribal Water Quality Control Officer:** The Tribal Water Quality Control Officer shall be responsible for:

(A) Designating beneficial uses for the waters of the Reservation;

(B) Developing regulations and policies to implement and to enforce the water quality standards pertaining to beneficial uses, water quality criteria and anti-degradation policy set forth in this Ordinance;

(C) Identifying water bodies or sections of water bodies which do not support beneficial uses;

(D) Establishing and overseeing the Tribe's point and non-point source permit review system;

(E) Conducting biannual assessments of the Tribe's water quality standards for review by the Business Council; and

(F) Developing regulations and policies to further the purpose of this Ordinance.

**304 Riparian Review Committee:** The Riparian Review Committee shall consist of four (4) persons: the Water Quality Control Officer or his/her representative; one member of the Business Council, one member of the Community Development Corporation and one Tribal Member At-Large. The Riparian Review Committee shall be responsible for:

(A) Reviewing the Tribe's water quality standards, Biannual Water Quality Assessment, National Pollution Discharge Elimination System Permits, other permits and review procedures, as set forth in this Ordinance;

(B) Specifying document submission and record keeping requirements to be adhered to by all potential dischargers or applicants for permits;

(C) Establishing criteria for the assessment of application and processing fees;

(D) Issuing permits, as required by this Ordinance, after approval by the Business Council. The Riparian Review Committee shall provide a recommendation with proposed findings on each permit for Business Council approval;

(E) Entering and inspecting any property, premises or facility involved in any activity which may affect water quality on any lands within the exterior boundaries of the Reservation and all other lands under the Business Council's jurisdiction. Such inspections may include, but are not limited to:

(1) Obtaining samples of soil, rock, vegetable, air, water or other substances deemed necessary; and

(2) Setting up and maintaining monitoring equipment for the purpose of assessing compliance with beneficial uses, water quality criteria, anti-

degradation policy, applicable regulations, best management practices or health or safety hazards;

(F) Obtaining from the Tribal Court, or other court of competent jurisdiction, a warrant or other order which may be necessary to carry out its responsibilities under this Ordinance; and

(G) Reviewing and recommending regulations for Business Council approval to further the purposes of this Ordinance, following notice and hearings or written opportunity for public comment.

**305 Enforcement:** [See Section 9 of this Ordinance for more details on enforcement.] The provisions of this Ordinance shall be enforced by REPA. Any Tribal Law Enforcement Officer, or any person officially appointed by the Business Council in consultation with the REPA, may issue the following for violations:

(A) Cease and Desist Orders or Notices of Violation: Upon a determination pursuant to an investigation as outlined in Section 903 of this Ordinance that any person is discharging or causing to be discharged or is about to discharge into any Reservation waters, directly or indirectly, any pollutant which constitutes a violation of this Ordinance, a Cease and Desist Order or Notice of Violation will be served upon the responsible parties and the landowner.

(B) It shall be a civil offense, for which a fine of not less than $500.00 shall be assessed, to obstruct or otherwise interfere with investigative or other activities of any agent or officer of the Tribe carrying out this Ordinance.

## Section 4 - Antidegradation Policy and Implementation Plan

### 401 Antidegradation Policy

(A) Existing uses shall be protected. The level of water quality necessary to protect existing uses shall be maintained.

(B) Where existing water quality exceeds levels necessary to support propagation of fish and wildlife and recreation in and on the water, that level of water quality shall nonetheless be maintained and protected unless it is found, after full satisfaction of governmental and public participation requirements, that a lower level of water quality is acceptable in order to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation of water quality, the Tribe shall impose the highest statutory and regulatory

requirements for point sources and shall impose best management practices for non-point sources.

(C) Where high quality waters constitute an outstanding national or Tribal resource, or waters of exceptional recreational or ecological significance, the water quality and uses of those water bodies shall be maintained and protected.

(D) In those cases where potential water quality impairments associated with thermal discharge are involved, the antidegradation policy and implementation method shall be consistent with Section 316 of the Clean Water Act, as amended (33 U.S.C. §1326).

**402 Implementation Plan:** Acting under authority delegated by the Business Council, the Tribal Water Quality Control Officer shall implement the Tribe's water quality standards, including the antidegradation policy, by establishing and maintaining controls on the introduction of pollutants into surface waters. More particularly, the Tribal Water Quality Control Officer shall do the following:

(A) Establish and maintain controls on the introduction of pollutants in surface waters of the Reservation;

(B) Monitor water quality to assess the effectiveness of pollution controls and to determine whether water quality standards are being attained;

(C) Obtain information as to the impact of effluents on receiving waters;

(D) Review the adequacy of the existing data base and obtain additional data when required;

(E) Assess the probable impact of effluents on receiving waters in light of designated uses and numeric and narrative standards;

(F) Require the highest and best degree of wastewater treatment practicable and commensurate with protecting and maintaining designated uses and existing water quality;

(G) Develop water quality based effluent limitations and comments on technology-based effluent limitations, as appropriate, for inclusion in any federal permit issued to a discharger pursuant to Section 402 of the Clean Water Act (33 U.S.C. §1342);

(H) Require that these effluent limitations be included in any such permit as a condition

for Tribal certification pursuant to Section 401 of the Clean Water Act (33 U.S.C. § §1341);

(I) Coordinate water pollution control activities with other constituent agencies and other local, state and federal agencies, as appropriate;

(J) Develop and pursue inspection and enforcement programs in order to ensure that dischargers comply with requirements of this Ordinance and any requirements promulgated by regulations or policies pursuant to this Ordinance, and in order to support the enforcement of federal permits by the U.S. EPA;

(K) Provide continuing technical training for wastewater treatment facility operators through training and certification programs;

(L) Provide funds to assist in the construction of publicly owned wastewater treatment facilities through the construction grants and revolving funds program authorized by the Clean Water Act (33 U.S.C. §1281), and other federal funds available for such purpose; and

(M) Encourage, in conjunction with other agencies, voluntary implementation of best management practices to control non-point sources of pollutants to achieve compliance with the standards set out in this Ordinance or in any regulations and policies promulgated pursuant to this Ordinance.

**Section 5 - Surface Water Quality Standards**

The water quality standards described in this section apply to all waters of the Reservation. Water quality standards described in this section designate beneficial uses and water quality for waters of the Reservation. Any subsequent standards that may be described in regulations and policies developed pursuant to this Ordinance must be at least as stringent as the standards provided below.

**501 Designated Uses:** For the purposes of this Ordinance, there are hereby established the following designated uses for the waters of the Reservation. A water body that is not listed in Section 502 but that is a tributary to a listed water body shall be protected by the water quality standards that have been established for the nearest downstream water body listed in Section 502. Water bodies within the Reservation which do not have beneficial uses designated for them are assigned wildlife habitat designations. These wildlife habitat designations in no way affect the presence or absence of other beneficial use designations in these water bodies. Further classification will be based on the size of the water body and its historic and environmental significance. Further, if a water body has more than one

designated use listed in Section 502, the applicable water quality criterion for a pollutant is the most stringent of those prescribed to protect the designated uses of the water body. Future studies and surveys may result in the reclassification of any or all waters of the Reservation.

The codes used in Section 502 are as follows:

(A) Municipal and Domestic Supply (MUN) includes usual uses in community water systems and domestic uses from individual water supply systems.

(B) Agricultural Supply (AGR) includes crop, orchard and pasture irrigation, stock watering, support of vegetation for range grazing and all uses in support of farming and ranching operations.

(C) Industrial Service Supply (IND) includes uses that do not depend primarily on water quality such as mining, cooling water supply, hydraulic conveyance, gravel washing and fire protection.

(D) Industrial Process Supply (PROC) includes process water supply and all uses related to the manufacturing of products.

(E) Groundwater Recharge (GWR) includes natural or artificial recharge for future extraction for beneficial uses.

(F) Hydropower Generation (POW) means used for hydropower generation.

(G) Cold Freshwater Habitat (COLD) includes uses of water that support cold water ecosystems including but not limited to preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

(H) Water Contact Recreation (REC-1) includes all recreational uses involving actual body contact with water, such as swimming, wading, water-skiing, skin-diving, surfing, sport fishing, uses in therapeutic spas and other uses where ingestion of water is reasonably possible.

(I) Non-Contact Water Recreation (REC-2) includes recreational uses which involve the presence of water but do not require contact with water, such as picnicking, sunbathing, hiking, beach combing, camping, pleasure boating, hunting and aesthetic enjoyment.

(J) Preservation of Areas of Special Biological Significance (BIOL) includes aquatic and

wildlife refuges, ecological reserves and designated areas of special biological significance.

(K) Wildlife Habitat (WILD) includes water bodies that provide a water supply and vegetation habitat for the maintenance of wildlife.

(L) Preservation of Threatened and Endangered Species (T&E) provides an aquatic habitat necessary, at least in part, for the survival of certain species established as being threatened and endangered species.

(M) Fish Migration (MGR) provides a migration route and temporary aquatic environment for anadromous or other fish species.

(N) Fish Spawning (SPAWN) provides a high quality aquatic habitat especially suitable for fish spawning.

(O) Cultural (CUL) has religious, ceremonial or subsistence significance or provides a role in Yurok Tribal culture.

**502 Use Classification Key**

The use classification key is as follows:

| | | |
|---|---|---|
| P | = | Potential Use |
| E | = | Existing Use |
| H | = | Historical Use |
| N/A | = | Not Applicable |

Full protection will be afforded to existing, potential and historical uses of the Reservation waters.

| Unit | Inter-state? | MUN | AGR | IND | PROC | GWR | POW | COLD | REC-1 |
|---|---|---|---|---|---|---|---|---|---|
| Klamath River | Yes | E,H,P | H,P | H,P | E,H | E,H | P | E,H | E,H |
| Waukell Creek | No | N/A | N/A | N/A | N/A | E,H | N/A | E,H | E,H,P |
| Ponds & Marshes** | No | N/A | H | E*, H* | E*, H* | E,H | N/A | E,H | E,H |

| Unit | Inter-State? | REC2 | BIOL | WILD | T&E | MGR | SPWN | CUL |
|---|---|---|---|---|---|---|---|---|
| Klamath River | Yes | E,H | E,H | E,H | E,H | E,H | E,H | E,H |
| Waukell Creek | No | E,H | P | E,H | E,H | E,H | E,H | E,H |
| Ponds & Marshes** | No | E,H | P | E,H | E,H | E,H | E,H | E.H |

*Since the 1964 Flood and the institution of sand and gravel mining and manufacturing, water has been pumped from the northern ponds for IND and for IPS with no significant environmental impact.
**Where appropriate, these classifications apply to the numerous unnamed springs and several small creeks found on the Reservation. These waters will be individually named or numbered and classified as studies and surveys are completed.

**503 General Water Quality Criteria:** The following criteria set forth limits or levels of water quality characteristics for surface waters to ensure the reasonable protection of beneficial uses from degradation or unreasonable effect of point and non-point pollution which may be a result of any cause including agricultural, mining, construction, urban runoff, silviculture, salt water intrusion, hydrological modification and residential activities. The water quality standards included in this Ordinance are developed on a Reservation-wide basis.

(A) Color: Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

(B) Tastes and Odors: Waters shall not contain taste or odor-producing substances in

concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, which cause nuisance or adversely affect beneficial uses.

(C) Floating Material: Waters shall not contain floating material, including solids, liquids, foams and scum in concentrations that cause nuisance, adversely affect beneficial uses or degrade water quality.

(D) Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

(E) Settleable Material: Waters shall not contain substances in concentrations that result in deposition of materials that cause nuisance or adversely affect beneficial uses.

(F) Oil and Grease: Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance or that otherwise adversely affect beneficial uses.

(G) Biostimulatory Substances: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

(H) Cyanobacteria Toxins: *Microcystis aeruginosa* cell densities shall be less than 5,000 cells/ml for drinking water and less than 50,000 cells/ml for surface water contact. Microcystin toxins shall be less than 1µg/l for drinking water and less than 10 µg/l for surface water contact, such as recreational or ceremonial uses (see Appendix A for justification of criteria).

(I) Sediment: The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

(J) Turbidity: Turbidity shall not be increased more than twenty percent (20%) above naturally occurring background levels.

(K) pH: The pH shall not be depressed below 7 nor raised above 8.5 for the Klamath River; and the pH shall not be depressed below 6.5 nor raised above 8.5 for Other Streams within the Lower Klamath River Hydrologic Area.

(L) Dissolved Oxygen: Dissolved concentrations shall not be reduced below the following minimum levels during seasons of rearing and spawning of cold water fish.

- 8.0 mg/L 7 day floating average minimum (7 DAMin) for COLD beneficial use of fish rearing
- 8.0 mg/L 7 DAMin in gravel beds for SPAWN beneficial use fish spawning
- 11 mg/L 7-DAMin in water column for SPAWN beneficial use for fish spawning

(M) Bacteria: The bacteriological quality of waters of the Reservation shall not be degraded beyond natural background levels. In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent (10%) of total samples during any 30-day period exceed 400/100 ml.

Fresh Waters REC-1
*Enterococci*

- Geometric Mean=33 cfu/100 ml
- Single Sample Maximum bacteria density (S.M.) range from 61-151 based on frequency of use

*E. coli*

- GM=126 cfu/100ml
- S.M. range from 235-576 based on frequency of use

(N) Temperature: The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Business Council that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any water be increased by more than 5 degrees F above natural receiving water temperature.

(O) Toxicity: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Riparian Review Committee.

(1) The survival of aquatic life in surface waters subjected to waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary for other control water that is consistent with the requirements for experimental

water: as described in Standard Methods for the Examination of Water and Waste Water, latest edition. At a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

(2) Effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water standards for specific toxicants will be established as sufficient data become available, and source control toxic substances will be encouraged.

(P) Pesticides: No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation in pesticide concentrations found in bottom sediments or aquatic life.

(Q) Radioactivity: Radionuclides shall not be present in concentrations which are deleterious to human, plant, animal or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal or indigenous aquatic life.

**504 Managing Discharges Attributable to Point and Non-point Sources:** Water quality standards shall be the basis for managing discharges attributable to point and nonpoint sources of pollution. Water quality standards are not used to control, and are not invalidated by, natural background phenomena or acts of God.

**505 Water Quality Criteria for Toxic Pollutants:** The potential benefits to human health of establishing toxic criteria include: (1) reducing the potential health risks to persons eating fish contaminated with toxic pollutants; (2) reducing the potential health risks to persons drinking contaminated drinking water; and (3) reducing the potential health risks to swimmers from dermal exposure to contaminated surface waters. The criteria listed below consist of two measures. The Water + Organisms measure represents the maximum ambient water concentration for consumption of both contaminated water and fish or aquatic organisms and to all water designated MUN. The Organisms Only measure represents the maximum ambient water concentration for consumption of fish or other aquatic organisms and applies to all waters without an MUN designation. The exposure to concentrations above the following specified criteria shall not exceed a thirty (30) day duration. All concentrations are micrograms per liter (µg/L), except asbestos, which is million fibers per liter (MFL). Blank spaces and pollutants not listed indicate that the U.S. Environmental Protection Agency has no Clean Water Act §304(a) criteria recommendations.

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| | **Pollutant** | **Water + Organism (µg/L)** | **Organism Only (µg/L)** |
|---|---|---|---|

| | Pollutant | Water + Organism (µg/L) | Organism Only (µg/L) |
|---|---|---|---|
| 1 | Aluminum | 50-200 [a] | |
| 2 | Antimony | 6 [p] | 4,300 [b] |
| 3 | Arsenic | 0.018 [c k m] | 0.14 [c k m] |
| 4 | Asbestos | 7 MFL [i] | |
| 5 | Beryllium | 4 [a] | [j] |
| 6 | Cadmium | 5 [p] | 10 [j] |
| 7 | Chromium (total) | 100 [p] | [j] |
| 8 | Copper | 1,000 [a n] | [j] |
| 9 | Cyanide (as free cyanide) | 200 [a] | 220,000 [b h] |
| 10 | Lead | 15 [p] | 50 [j] |
| 11 | Mercury | 0.050 [b] | 0.051 [b] |
| 12 | Nickel | 610 [b] | 4,600 [b] |
| 13 | Selenium | 10 [d] | 11,000 |
| 14 | Silver | 50 [j] | 50 [j] |
| 15 | Thallium | 1.7 [b] | 6.3 [b] |
| 16 | Zinc | 5,000 [a n] | 69,000 |
| 17 | 2,3,7,8-TCDD Dioxin | $1.3E^{-8}$ [c] | $1.4E^{-8}$ [c] |
| 18 | Acrolein | 190 [q] | 780 |
| 19 | Acrylonitrile | 0.05 [q] | 0.66 |
| 20 | Alachlor | 2 [p] | |
| 21 | Atrazine | 3 [p] | |
| 22 | Barium | 1,000 [f] | |
| 23 | Bentazon | 18 [d] | |
| 24 | Benzene | 1 [d] | 71 [b c] |
| 25 | Bromoform | 4.3 [b c] | 360 [b c] |
| 26 | Carbofuran | 18 [d] | |
| 27 | Carbon Tetrachloride | 0.25 [b c] | 4.4 [b c] |
| 28 | Chlorine (as $Cl_2$) | 4,000 [a] | |
| 29 | Chloride | 250,000 [a] | |
| 30 | Chlorobenzene | 20 [n] | 21,000 [b h] |
| 31 | Chlorodibromomethane | 0.41 [b c] | 13 [b c] |
| 32 | Chloroform | 5.7 [b c] | 470 [b c] |
| 33 | Chlorophenoxy Herbicide 2,4,5,-TP (Silvex) | 10 [a] | |
| 34 | Chlorophenoxy Herbicide 2,4-D | 40 [a] | |
| 35 | Dalapon | 200 [p] | |
| 36 | 1,2-Dibromo-3-chloropropane | 0.20 [a d] | |

| | Pollutant | Water + Organism (µg/L) | Organism Only (µg/L) |
|---|---|---|---|
| 37 | Dichlorobromomethane | 0.56 [b c] | 17 [b c] |
| 38 | 1,1-Dichloroethane | 5 [j] | 5 [j] |
| 39 | 1,2-Dichloroethane | 0.38 [b c] | 99 [b c] |
| 40 | 1,1-Dichloroethylene | 0.057 [b c] | 3.2 [b c] |
| 41 | 1,2-Dichloropropane | 0.52 [b c] | 39 [b c] |
| 42 | 1,3-Dichloropropene | 0.5 [d] | 1,700 [b] |
| 43 | Ether, Bis Chloromethyl | 0.00013 [b] | 0.00078 [b] |
| 44 | Ethylbenzene | 680 [d] | 29,000 [b] |
| 45 | Ethylene Dibromide | 0.02 [d] | |
| 46 | Glyphosate | 700 [a d] | |
| 47 | Hexachlorocyclo-hexane-Technical | 0.0123 | 0.0414 |
| 48 | Iron | 300 [f] | |
| 49 | Manganese | 50 [f q] | 100 [f] |
| 50 | Methyl Bromide | 47 [a] | 1,500 [a] |
| 51 | Methyl Chloride | [j] | [j] |
| 52 | Methylene Chloride | 4.6 [a c] | 590 [a c] |
| 53 | Methoxychlor | 40 [a] | |
| 54 | Nitrates | 10,000 [a] | |
| 55 | Nitrites | 1,000 [a] | |
| 56 | Nitrosamines | 0.0008 | 1.24 |
| 57 | 1,1,2,2-Tetrachloroethane | 0.17 [a c] | 4 [a c] |
| 58 | Tetrachloroethylene | 0.69 [a c] | 3.3 [a] |
| 59 | Toluene | 1,000 [a] | 200,000 [b] |
| 60 | 1,2-cis-Dichloroethylene | 6 [a] | |
| 61 | 1,2-Trans-Dichloroethylene | 10 [d] | 140,000 [b] |
| 62 | 1,1,1-Trichloroethane | 200 [a] | 200 [j] |
| 63 | 1,1,2-Trichloroethane | 0.60 [b c] | 32 [d] |
| 64 | Trichloroethylene | 2.7 [c] | 81 [c] |
| 65 | Simazine | 4 [a] | |
| 66 | Sulfate | 250,000 [a] | |
| 67 | Vinyl Chloride | 0.5 [d] | 525 [c] |
| 68 | Xylenes (total) | 1,750 [d e] | |
| 69 | 2-Chlorophenol | 0.1 [n] | 400 [b o] |
| 70 | 2,4-Dichlorophenol | 0.3 [n] | 790 [b o] |
| 71 | 2,4-Dimethylphenol | 380 [q n] | 850 [q o] |
| 72 | 2-Methyl-4,6-Dinitrophenol | 13 [a] | 280 [a] |
| 73 | 2,4-Dinitrophenol | 69 [a q] | 5300 [a] |

| | Pollutant | Water + Organism (µg/L) | Organism Only (µg/L) |
|---|---|---|---|
| 74 | 3-Methyl-4-Chlorophenol | 3,000 [n] | [m] |
| 75 | Pentachlorophenol | 0.27 [a c] | 3 [a c h] |
| 76 | Phenol | 300 [a n] | 1,700,000 [b h o] |
| 77 | 2,4,6-Trichlorophenol | 1.4 [a c n] | 2.4 [a c] |
| 78 | Acenaphthene | 20 [b n] | 2,700 [b o] |
| 79 | Anthracene | 8,300 [a] | 10,000 [a] |
| 80 | Benzidine | 0.000086 [a c] | 0.0002 [a c] |
| 81 | BenzoaAnthracene | 0.0038 [a c] | 0.018 [a c] |
| 82 | BenzoaPyrene (PAHs) | 0.0038 [a c] | 0.018 [a c] |
| 83 | BenzobFluoranthene | 0.0038 [a c] | 0.018 [a c] |
| 84 | BenzokFluoranthene | 0.0038 [a c] | 0.018 [a c] |
| 85 | Bis2-ChloroethylEther | 0.031 [a c] | 0.53 [a c] |
| 86 | Bis2-ChloroisopropylEther | 1,400 [q] | 170,000 [b] |
| 87 | Bis2-EthylhexylPhthalate | 1.2 [a c] | 2.2 [a c] |
| 88 | Butyl Benzylphthalate | 1,500 [a] | 1,900 [a] |
| 89 | 2-Chloronaphthalene | 1,000 [a] | 1,600 [a] |
| 90 | Chrysene | 0.0038 [a c] | 0.018 [a c] |
| 91 | Dibenzoa,hAnthracene | 0.0038 [a c] | 0.018 [a c] |
| 92 | 1,2-Dichlorobenzene | 63 [a g] | 190 [a] |
| 93 | 1,3-Dichlorobenzene | 320 [a] | 960 [a] |
| 94 | 1,4-Dichlorobenzene | 5 [d] | 190 [a] |
| 95 | 3,3§-Dichlorobenzidine | 0.021 [a c] | 0.028 [a c] |
| 96 | Diethyl Phthalate | 1,700 [q] | 120,000 [b] |
| 97 | Di (2-ethylhexyl) phthalate | 1.2 [a] | 2.2 [a] |
| 98 | Dimethyl Phthalate | 270,000 [a] | 1,100,000 [a] |
| 99 | Di-n-Butyl Phthalate | 2,000 [a] | 4,500 [a] |
| 100 | 2,4-Dinitrotoluene | 0.11 [a c] | 3.4 [c] |
| 101 | 1,2-Diphenylhydrazine | 0.036 [a c] | 0.2 [a c] |
| 102 | Dinitrophenols | 69 [a] | 5,300 [a] |
| 103 | Fluoranthene | 130 [a] | 140 [a] |
| 104 | Fluorene | 1,100 [a] | 5,300 [a] |
| 105 | Fluoride | 1,400 [b] | |
| 106 | Hexachlorobenzene | 0.00028 [a c] | 0.00029 [a c] |
| 107 | Hexachlorobutadiene | 0.44 [a c] | 18 [a c] |
| 108 | Hexachlorocyclopentadiene | 1 [n] | 11,000 [a h o] |
| 109 | Hexachloroethane | 1.4 [a c] | 3.3 [a c] |
| 110 | Ideno 1,2,3-cdPyrene | 0.0038 [a c] | 0.018 [a c] |
| 111 | Isophorone | 35 [a c] | 960 [a c] |

| | Pollutant | Water + Organism (µg/L) | Organism Only (µg/L) |
|---|---|---|---|
| 112 | Molinate | 20 [d] | |
| 113 | Nitrobenzene | 17 [b] | 690 [a h o] |
| 114 | Nitrosodibutylamine, N | 0.0064 [f] | 0.587 [f] |
| 115 | Nitrosodiethylamine, N | 0.0008 [f] | 1.24 [f] |
| 116 | N-Nitrosodimethylamine | 0.00069 [a c] | 3 [a c] |
| 117 | N-Nitrosodi-n-Propylamine | 0.005 [a c] | 0.51 [a c] |
| 118 | N-Nitrosodiphenylamine | 3.3 [a c] | 6 [a c] |
| 119 | Nitrosopyrrolidine, N | 0.016 | 91.9 |
| 120 | Pyrene | 830 [a] | 4,000 [a] |
| 121 | 1,2,4-Trichlorobenzene | 35 [a] | 70 |
| 122 | Pentachlorobenzene | 3.5 [b] | 4.1 [b] |
| 123 | Tetrachlorobenzene, 1,2,4,5- | 2.3 [b] | 2.9 [b] |
| 124 | Trichlorophenol, 2,4,5- | 1 [n] | 9,800 [b o] |
| 125 | Aldrin | 0.000049 [a c] | 0.00005 [a c] |
| 126 | alpha-BHC | 0.0026 [a c] | 0.0049 [a c] |
| 127 | beta-BHC | 0.0091 [a c] | 0.0017 [a c] |
| 128 | gamma-BHC (Lindane) | 0.019 [c] | 0.063 [c] |
| 129 | Chlordane | 0.0008 [a c] | 0.00081 [a c] |
| 130 | 4,4§-DDT | 0.00022 [a c] | 0.00022 [a c] |
| 131 | 4,4§-DDE | 0.00022 [a c] | 0.00022 [a c] |
| 132 | 4,4§-DDD | 0.00031 [a c] | 0.00031 [a c] |
| 133 | Dieldrin | 0.000052 [a c] | 0.000054 [a c] |
| 134 | alpha-Endosulfan | 62 [a] | 89 [a] |
| 135 | beta-Endosulfan | 62 [a] | 89 [a] |
| 136 | Endosulfan Sulfate | 62 [a] | 89 [a] |
| 137 | Endrin | 0.59 [a] | 0.6 [a h] |
| 138 | Endrin Aldehyde | 0.29 [a] | 0.3 [a h] |
| 139 | Heptachlor | 0.000079 [a c] | 0.000079 [a c] |
| 140 | Heptachlor Epoxide | 0.00010 [b c] | 0.00011 [b c] |
| 141 | Polychlorinated Biphenyls PCBs | 0.000064 [a c l] | 0.000064 [a c l] |
| 142 | Toxaphene | 0.00028 [a c] | 0.00028 [a c] |
| 143 | Foaming Agents | 500 [a] | |
| 144 | Solids, Dissolved and Salinity | 250,000 [f] | |

**Footnotes:**

[a] This value is at least as stringent or more stringent than those listed in the EPA's *National Recommended Water Quality Criteria—Correction* document (December 2002) and the EPA Priority Pollutants List with Standards (February 16, 2005) and/or the Regional Water Quality Control Board's *Water Quality Control Plan for the North Coast Region* (adopted December 9, 1993, with amendments through August 31, 2005).

[b] This criterion has been revised to reflect the Environmental Protection Agency's ql* or RfD, as contained in the Integrated Risk Information System (IRIS) as of April 8, 1998. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.

[c] This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$, move the decimal point in the recommended criterion one place to the right).

[d] This criterion was obtained from the Regional Water Quality Control Board's *Water Quality Control Plan for the North Coast Region* (adopted December 9, 1993, with amendments through August 31, 2005). It is a more stringent value than those listed in the EPA's *National Recommended Water Quality—Correction* document (April 1999).

[e] MCL is for either a single isomer or the sum of the isomers.

[f] This human health criterion is the same as originally published in the Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value is now published in the Gold Book.

[g] A more stringent MCL has been issued by EPA. Refer to drinking water regulations (40 CFR 141) or Safe Drinking Water Hotline (1-800-426-4791) for values.

[h] No criterion for protection of human health from consumption of aquatic organisms excluding water was presented in the 1980 criteria document or in the 1986 *Quality Criteria for Water.* Nevertheless, sufficient information was presented in the 1980 document to allow the calculation of a criterion, even though the results of such a calculation were not shown in the document.

[i] This criterion for asbestos is the Maximum Contaminant Level (MCL) developed under the Safe Drinking Water Act (SDWA).

[j] EPA has not calculated human health criterion for this contaminant. However, permit authorities should address this contaminant in NPDES permit actions using the State's existing narrative criteria for toxics. When a criterion value is listed, the MCL was obtained either from the Regional Water Quality Control Board's *Water Quality Control Plan for the North Coast Region* (adopted December 9, 1993, with amendments through August 31, 2005).

[k] This recommended water quality criterion refers to the inorganic form only.

[l] This criterion applies to total PCB's, i.e., the sum of all congener or all isomer analyses.

[m] EPA is currently reassessing the criteria for arsenic. Upon completion of the reassessment the REPA will publish revised criteria as appropriate.

[n] This is the organoleptic effect criterion, which is more stringent than the value for priority toxic pollutants listed in the EPA's *National Recommended Water Quality Criteria—Correction* document (April 1999).

[o] The organoleptic effect criterion is more stringent than the value for priority toxic pollutants.

[p] EPA MCL.

[q] EPA Human Health Water Quality Criteria. Not enforceable.

**506** **Aquatic Life Criteria:** The concentration for each compound listed below is a criteria not to be exceeded in waters for aquatic life. The Acute criteria or Critical Maximum Concentration (CMC) is the threshold value at or below which there should be no unacceptable effects to freshwater aquatic organisms and their uses if the one-hour average

concentration does not exceed that CMC value more than once every three years on average. The Chronic Criteria or Criteria Continuous Concentration (CCC) is the threshold value at or below which there should be no unacceptable effects to freshwater aquatic life and their uses if the four-day average concentration does not exceed that CCC value more than once every three years on average. Where criterion has not been established, the Lowest Observable Adverse Effect Level (LOAEL) shall apply. Blank spaces and pollutants not listed indicate that the U.S. Environmental Protection Agency has no Clean Water Act §304(a) criteria recommendations.

| | **Pollutant** | **CMC (µg/L)** | **CCC (µg/L)** |
|---|---|---|---|
| 1 | Alkalinity | | 20,000 [u] |
| 2 | Aluminum pH 6.5 - 9.0 | 750 [v w] | 87 [v w x] |
| 3 | Arsenic | 340 [a d h] | 150 [a d h] |
| 4 | Cadmium | 2 [z d e h] | 0.25 [z d e h] |
| 5 | Chloride | 860,000 [v] | 230,000 [v] |
| 6 | Chlorine | 19 | 11 |
| 7 | Chloropyrifos | 0.083 [v] | 0.041 [v] |
| 8a | Chromium III | 570 [z d e h] | 74 [z d e h] |
| 8b | Chromium IV | 16 [z d h] | 11 [z d h] |
| 9 | Copper | 13 [z d e h s] | 9 [z d e h s] |
| 10 | Demeton | | 0.1 [u] |
| 11 | Guthion | | 0.01 [u] |
| 12 | Iron | | 1,000 [u] |
| 13 | Lead | 65 [z d e r t] | 2.5 [z d e r t] |
| 14 | Malathion | | 0.1 [u] |
| 15 | Mercury | 1.4 [d h r] | 0.77 [d h r] |
| 16 | Methoxychlor | | 0.03 [u] |
| 17 | Mirex | | 0.001 [u] |
| 18 | Nickel | 470 [z d e h] | 52 [z d e h] |
| 19 | Parathion | 0.065 [h] | 0.013 [h] |
| 20 | Selenium | [i m n] | 5.0 [n] |
| 21 | Silver | 3.4 [d e g] | |
| 22 | Sulfide-Hydrogen Sulfide | | 2.0 [u] |
| 23 | Tributyltin TBT | 0.46 [y] | 0.072 [y] |
| 24 | Zinc | 120 [z d e h] | 120 [z d e h] |
| 25 | Cyanide | 22 [z h l] | 5.2 [z h l] |
| 26 | Pentachlorophenol | 19 [z f h] | 15 [z f h] |
| 27 | Aldrin | 3.0 [z g] | |
| 28 | gamma-BHC (Lindane) | 0.95 [z h] | |
| 29 | Chlordane | 2.4 [z b c] | 0.0043 [z g q] |

| | Pollutant | CMC (µg/L) | CCC (µg/L) |
|---|---|---|---|
| 30 | 4,4§-DDT | 1.1 [z b g] | 0.001 [z g q] |
| 31 | Dieldrin | 0.24 [z h] | 0.056 [z h k] |
| 32 | alpha-Endosulfan | 0.22 [z g p] | 0.056 [z g p] |
| 33 | beta-Endosulfan | 0.22 [z g p] | 0.056 [z g p] |
| 34 | Endrin | 0.086 [z h] | 0.036 [z h k] |
| 35 | Heptachlor | 0.52 [z g] | 0.0038 [z g q] |
| 36 | Heptachlor Epoxide | 0.52 [z g o] | 0.0038 [z g o q] |
| 37 | Polychlorinated Biphenyls PCBs | | 0.014 [j q] |
| 38 | Toxaphene | 0.73 [z] | 0.0002 [z q] |

**Footnotes:**

[a] This recommended water quality criterion was derived from data for arsenic (III), but is applied here to total arsenic, which might imply that arsenic (III) and arsenic (V) are equally toxic to aquatic life and that their toxicities are additive. In the arsenic criteria document (EPA 440/5-84-033, January 1985), Species Mean Acute Values are given for both arsenic (III) and arsenic (V) for five species and the ratios of the SMAVs for each species range from 0.6 to 1.7. Chronic values are available for both arsenic (III) and arsenic (V) for one species; for the fathead minnow, the chronic value for arsenic (V) is 0.29 times the chronic value for arsenic (III). No data are known to be available concerning whether the toxicities of the forms of arsenic to aquatic organisms are additive.

[b] This criterion has been revised to reflect The EPA's q1* or RfD, as contained in the Integrated Risk Information System (IRIS) as of April 8, 1998. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.

[c] This criterion is based on carcinogenicity of $10^{-6}$ risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of $10^{-5}$, move the decimal point in the recommended criterion one place to the right).

[d] Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and multiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column. (Conversion Factors for saltwater CCCs are not currently available. Conversion factors derived for saltwater CMCs have been used for both saltwater CMCs and CCCs). See "Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria," October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource center, USEPA, 401 M St., SW, mail code RC4100, Washington, DC 20460; and 40CFR§131.36(b)(1). Conversion Factors applied in the table can be found in Appendix A to the Preamble- Conversion Factors for Dissolved Metals.

[e] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 100 mg/L. Criteria values for other hardness may be calculated from the following: CMC (dissolved) = exp{mA [ln( hardness)]+ bA} (CF), or CCC (dissolved) = exp{mC [ln (hardness)]+ bC} (CF) and the parameters specified in Appendix B to the Preamble- Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent.

[f] Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as

follows: CMC = exp(1.005(pH)-4.869); CCC = exp(1.005(pH)-5.134). Values displayed in table correspond to a pH of 7.8.

[g] This Criterion is based on 304(a) aquatic life criterion issued in 1980, and was issued in one of the following documents: Aldrin/Dieldrin (EPA 440/5-80-019), Chlordane (EPA 440/5-80-027), DDT (EPA 440/5-80-038), Endosulfan (EPA 440/5-80-046), Endrin (EPA 440/5-80-047), Heptachlor (440/5-80-052), Hexachlorocyclohexane (EPA 440/5-80-054), Silver (EPA 440/5-80-071). The Minimum Data Requirements and derivation procedures were different in the 1980 Guidelines than in the 1985 Guidelines. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

[h] This recommended criterion is based on a 304(a) aquatic life criterion that was issued in the *1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water*, (EPA-820-B-96-001, September 1996). This value was derived using the GLI Guidelines (60FR15393-15399, March 23, 1995; 40CFR132 Appendix A); the difference between the 1985 Guidelines and the GLI Guidelines are explained on page iv of the 1995 Updates. None of the decisions concerning the derivation of this criterion were affected by any considerations that are specific to the Great Lakes.

[i] The CMC = 1/[(f1/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/l and 12.83 µg/l, respectively.

[j] PCBs are a class of chemicals which include aroclors, 1242, 1254, 1221, 1232, 1248, 1260, and 1016, CAS numbers 53469219, 11097691, 11104282, 11141165, 12672296, 11096825 and 12674112 respectively. The aquatic life criteria apply to this set of PCBs.

[k] The derivation of the CCC for this pollutant did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels.

[l] This recommended water quality criterion is expressed as µg free cyanide (as CN)/L.

[m] This value was announced (61FR58444-58449, November 14, 1996) as a proposed GLI 303(c) aquatic life criterion. EPA is currently working on this criterion and so this value might change substantially in the near future.

[n] This recommended water quality criterion is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor of 0.922 that was used in the GLI to convert this to a value that is expressed in terms of dissolved metal.

[o] This value was derived from data for heptachlor and the criteria document provides insufficient data to estimate the relative toxicities of heptachlor and heptachlor epoxide.

[p] This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.

[q] This CCC is based on the Final Residue Value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60FR15393-15399, March 23, 1995), the Agency no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.

[r] This water quality criterion is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, PB85-227049, January 1985) and was issued in one of the following criteria documents: Arsenic (EPA 440/5-84-033), Cadmium (EPA 440/5-84-032), Chromium (EPA 440/5-84-029), Copper (EPA 440/5-84-031), Cyanide (EPA 440/5-84-028), Lead (EPA 440/5-84-027), Nickel (EPA 440/5-86-004), Pentachlorophenol (EPA 440/5-86-009), Toxaphene, (EPA 440/5-86-006), Zinc (EPA 440/5-87-

003).

[s] When the concentration of dissolved organic carbon is elevated, copper is substantially less toxic and use of Water-Effect Ratios might be appropriate.

[t] EPA is actively working on this criterion and so this recommended water quality criterion may change substantially in the near future.

[u] The derivation of this value is presented in the Red Book (EPA 440/9-76-023, July, 1976).

[v] This value is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses*, PB85-227049, January 1985) and was issued in one of the following criteria documents: Aluminum (EPA 440/5-86-008); Chloride (EPA 440/5-88-001); Chloropyrifos (EPA 440/5-86-005).

[w] This value is expressed in terms of total recoverable metal in the water column.

[x] There are three major reasons why the use of Water-Effect Ratios might be appropriate. (1) The value of 87 µg/l is based on a toxicity test with the striped bass in water with pH= 6.5-6.6 and hardness <10 mg/L. Data in "Aluminum Water-Effect Ratio for the 3M Plant Effluent Discharge, Middleway, West Virginia" (May 1994) indicate that aluminum is substantially less toxic at higher pH and hardness, but the effects of pH and hardness are not well quantified at this time. (2) In tests with the brook trout at low pH and hardness, effects increased with increasing concentrations of total aluminum even though the concentration of dissolved aluminum was constant, indicating that total recoverable is a more appropriate measurement than dissolved, at least when particulate aluminum is primarily aluminum hydroxide particles. In surface waters, however, the total recoverable procedure might measure aluminum associated with clay particles, which might be less toxic than aluminum associated with aluminum hydroxide. (3) EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg aluminum/L, when either total recoverable or dissolved is measured.

[y] This value was announced (62FR42554, August 7, 1997) as a proposed 304(a) aquatic life criterion. Although EPA has not responded to public comment, EPA is publishing this as a 304(a) criterion in today's notice as guidance for States and Tribes to consider when adopting water quality criteria. The document Aquatic Life Criteria for Tributyltin (TBT) was published by US EPA in January 2004.

[z] These criteria are based on the EPA Priority Pollutants List with Standards (February 16, 2005).

**507 Biological Criteria:** The following biological criteria shall apply to the waters of the Reservation.

(A) All surface waters shall be of sufficient quality to support aquatic biota without detrimental changes in the resident aquatic communities.

(B) Waters of the Reservation shall be free from substances, whether attributable to point source discharges, nonpoint sources or instream activities, in concentrations or combinations which would impair the structure or limit the function of the resident aquatic community as it naturally occurs.

(C) The structure and function of the resident aquatic community shall be measured by biological assessment methods approved by the Riparian

Review Committee.

(D) Determination of impairment or limitation of the resident aquatic community may be based on comparison with the aquatic community found at an appropriate reference site or region.

**508 Wildlife Criteria:** All surface waters shall be of sufficient quality to protect and support all life stages of resident or migratory wildlife species and which lie in, on or near the waters of the Reservation.

**509 Wetlands Criteria:** The following wetlands criteria shall apply to all waters of the Reservation:

(A) Water quality in wetlands shall be maintained at naturally occurring levels, within the natural range of variation for individual wetlands.

(B) Physical and biological characteristics shall be maintained and protected by:

(1) Maintaining hydrological conditions, including hydro period, hydrodynamics and natural water temperature variations;

(2) Maintaining the natural hydrophitic vegetation; and

(3) Maintaining substrate characteristics necessary to support existing and characteristic uses.

**510 Modification of Standards to Reflect Attainability:** In the event that monitoring of water quality identifies areas where attainable water quality is less than what is required by the standards set out herein, then the REPA, after consultation with the Business Council, may modify the water quality standards to reflect attainability. Modification thereof shall be within the sole discretion of the Business Council, but shall be subject to the provisions of the Clean Water Act, and shall be carried out in accordance with the use-attainability analysis procedures set forth in the Clean Water Act.

**511 Revision of Standards and Errors**

(A) Revisions: The water quality standards promulgated pursuant to this Ordinance, may be revised, from time to time, or as the need arises, or as the result of updated scientific information.

(B) Errors: Errors resulting from inadequate and erroneous data or human or

clerical oversight will be subject to correction by the REPA. The discovery of such errors does not render the remaining and unaffected provisions of the Tribe's water quality standards invalid. If any provision of this Ordinance, or the application of any provision of this Ordinance, including any standards set out in regulations and policies promulgated hereunder, to any person or circumstance, should be held to be invalid, the application of such provision to other persons and circumstances and the remainder of this Ordinance and such regulations and policies shall not be affected thereby.

## Section 6 - Sampling and Analysis

**601 Sample Collection, Preservation and Analysis to Determine Water Quality and Maintain Standards:** Sample collection, preservation and analysis used to determine water quality and to maintain the standards set forth herein shall be performed in accordance with procedures prescribed by the latest EPA authoritative analytical reference, including but not limited to the latest editions of any of the following authorities: (1) American Public Health Association, *Standard Methods for the Examination of Water and Wastewater*; (2) *Methods for Chemical Analysis of Water and Wastes;* or (3) EPA's *Guidelines Establishing Test Procedures for the Analysis of Pollutants*.

**602 Bacteriological Surveys:** The monthly geometric mean used in assessing attainment of standards when a minimum of five samples is collected in a 30-day period. When less than five samples are collected in a 30-day period, no single sample shall exceed the applicable upper limit for bacterial density set for in Section 503(L).

**603 Sampling Procedures**

(A) Streams: Stream monitoring stations below waste discharges shall be located a sufficient distance downstream to ensure adequate vertical and lateral mixing.

(B) Reservoirs, Ponds or Lakes: Sampling stations in reservoirs, ponds or lakes shall be located at least 250 feet from a waste discharge, and, otherwise, where the attainment of a water quality standard is to be assessed. Water quality measurements shall be taken at intervals in the water column at a sampling station. For toxic substances and nutrients, the entire water column shall be made in the epilimnion. In non-stratified reservoirs, ponds and lakes, measurements will be made at intervals throughout the entire water column.

## Section 7 - Notice of Discharges

**701 Notice of Discharge:** Except as permitted pursuant to this Ordinance, any person that

discharges any pollutant into the waters of the Reservation shall immediately notify the Riparian Review Committee of such discharge and shall fully disclose the information regarding the discharge including the type of pollutant, the amount, the location and other information required by the Riparian Review Committee.

**Section 8 - Permit and Inspection Program**

**801 Permits Required:** No person shall discharge any pollutant into any Reservation water from a point source or conduct dredge and fill activities in any designated wetland area of the Reservation without first having applied for and obtained a permit from the Riparian Review Committee after approval by the Business Council. Any person who intends to alter or enlarge an existing activity authorized by this Ordinance, or who intends to cause or direct such alteration or enlargement of such activities, shall, prior to alteration or enlargement of such activities, apply for and obtain a valid permit from the Riparian Review Committee after approval by the Business Council.

(A) Contents of Application. Permit applications will include the following information:

(1) Identification and address of the owner and operator of the activity, facility or process from which the discharge is to be permitted;

(2) Location and quantity and quality characteristics of the permitted discharge;

(3) Effluent limitations and requirements for treatment prior to discharge;

(4) Equipment and procedures required for mandatory monitoring as well as record-keeping and reporting requirements;

(5) Schedules of compliance;

(6) Procedures to be followed by tribal personnel for entering and inspecting the premises;

(7) Submission of pertinent plans and specifications for the facility, process or activity which is the source of the discharge;

(8) Restrictions on transfer of the permit;

(9) Procedures to be followed in the event of expansion or modification of the facility, process or activity from which the discharge occurs or the quantity,

quality or frequency of the discharge; and

(10) Duration of the permit and renewal procedures.

(B) Application Under Oath. Each applicant shall sign the permit application under oath, certifying the truth and accuracy of the information contained in the permit application, in a form approved by the Riparian Review Committee.

(C) Fees. A processing and monitoring fee, as established by the Riparian Review Committee, shall be paid to the Tribe at the time of filing. These fees shall be used for costs associated with administering this Ordinance.

(D) Review of Application by Tribal Departments. A sufficient number of copies, as determined by the Riparian Review Committee, of the application and any proposed mitigation plan shall be furnished by the applicant. Upon receipt of a permit application, the Riparian Review Committee shall transmit one copy to the Business Council and any other Tribal agencies that should be involved in the review/decision-making process for their written recommendations. Failure of the departments to respond in writing to the Riparian Review Committee within thirty (30) days of receipt shall indicate approval or no desire to comment by the department.

(E) Except as otherwise provided in this Ordinance, permit applicants shall demonstrate that the proposed alteration, enlargement or new regulated activity will not adversely affect water quality and is designed to avoid substantial disturbance of the soils, topography, drainage, vegetation and other water related natural characteristics of the site.

(F) Public Notice and Hearing on Permit Application. Public notice of every complete application for a discharge permit shall be circulated in a manner designed to inform interested and potentially interested persons of the proposed discharge and of the proposed determination to issue or deny a permit. Procedures for the circulation of public notice shall be established by the Tribe and shall include at least the following:

(1) Notice shall be circulated within the geographical areas of the proposed discharge.

(2) Notice shall be mailed to any person or group upon request.

(3) Upon request, the Tribe shall add the name of any person or group to a mailing list to receive copies of notices for all discharge applications within the Reservation or within a certain geographic area.

(4) The Tribe shall promulgate such regulations as are necessary and appropriate to provide an opportunity for public hearing, when appropriate, prior to granting or denying a discharge permit.

(G) Permit applications, any required environmental documents and mitigation plan proposals must demonstrate compliance with applicable Tribal regulations including but not limited to those pertaining to water quality, hazardous substances, environmental impact evaluations and riparian protection.

(H) Nothing in any permit shall ever be construed to prevent or limit the application of any emergency power of the Tribe.

**802 Categorical Exclusions and Variances:** The Business Council may by regulation exclude categories of uses, activities or projects from requirements of this Ordinance for one or more of the following reasons:

(A) Naturally occurring pollution;

(B) Natural low-flow conditions;

(C) Irretrievable human-caused conditions; and/or

(D) Substantial and widespread economic and social impacts.

A variance to establish water quality objectives may be granted by the Riparian Review Committee after approval by the Business Council, only when the applicant satisfactorily demonstrates that:

(A) Water quality will not be permanently impaired;

(B) Public health will not be threatened;

(C) No significant adverse environmental effects will occur due to the limited size or scale of a proposed activity;

(D) A mitigation plan approved by the Riparian Review Committee demonstrates that all discharges will be below the Tribe's established water quality standards as set forth herein before the expiration of the variance;

(E) The variance does not exceed one year from the date of issuance; and

(F) A 30-day public review period has passed with at least one public meeting.

## 803 Issuance of Permit; Final Environmental Determination

(A) Upon compliance with this Ordinance, the Riparian Review Committee may make findings and issue the permit as provided in this Ordinance. The permit shall specify the person authorized to operate the facility and the boundaries of the facility. The permit shall contain such conditions as are necessary to protect the public health and safety and the environment.

(B) Copies of the permit (including conditions specified therein), findings and any documents setting forth the Riparian Review Committee's final environmental determination shall be made available for inspection and copying to any person so requesting.

(C) Denial of Permit. The Riparian Review Committee shall deny the permit when any of the following occur:

(1) The Riparian Review Committee determines that the proposed discharge is not consistent with this Ordinance or other applicable tribal or federal laws.

(2) The Riparian Review Committee determines that it will be impossible to propose a permit that will be mutually satisfactory to the Committee and the discharger.

(3) Any other circumstances provided by law.

(D) Upon denial of a permit, the Riparian Review Committee shall give written notice of the denial to the discharger and any other person who has requested in writing that such notice be given. Notice to the operator shall be accompanied by a form request for re-hearing.

(E) An operator who desires an appeal of the denial of a permit shall file with the Riparian Review Committee a written request for a re-hearing before the Committee within fifteen (15) days after receiving notice of the denial of the permit. The hearing procedures will be the same as set out in Section 9, Administrative Procedures.

## 804 Monitoring and Records; Inspections

(A) Monitoring and Records The permittee shall monitor the discharge pursuant

to the conditions of the permit. Sampling and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall retain records of all monitoring information, including calibration and maintenance records and copies of all reports required by the permit. Records for monitoring shall include:

(1) The date, exact place and time of sampling or measurement;

(2) The individual(s) who performed the sampling or monitoring;

(3) The date analysis was performed;

(4) The analytical techniques or methods used; and

(5) The results of such analysis.

(B) Inspections and Entry. The permittee shall allow an authorized agent of the REPA or the designated enforcement officer, upon presentation of credential to:

(1) Enter upon the permittee's premises where a regulated facility, activity or process is located, or where records must be kept under the conditions of the permit;

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment) practices or operations regulated or required under the permit; and

(4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the appropriate Tribal Ordinance, any substances or parameters at any location.

**Section 9 - Enforcement Program/Administrative Procedures**

**901 Enforcement Policy:** It is the policy of the Riparian Review Committee to encourage informal, practical, result-oriented resolution of alleged violations and actions needed to prevent damage to Reservation resources or harm to the health, safety or welfare of the Reservation population. It is also the policy of the Riparian Review Committee, consistent with the principles of due process, to provide effective procedures for enforcement.

**902** **Enforcement Agency:** The Resighini Rancheria Environmental Protection Authority shall be responsible for enforcing the provisions of this Ordinance. Specifically, the REPA shall conduct investigations when a complaint is received by the Tribal Water Quality Control Officer or where the Tribal Water Quality Control Officer, Riparian Review Committee or other Tribal agency believes that a violation of this Ordinance has occurred.

**903** **Enforcement Activities:** Where a written and verified complaint shall be filed with the Tribal Water Quality Control Officer and reviewed by the Riparian Review Committee alleging that, or where the Tribal Water Quality Control Officer or Riparian Review Committee itself shall have cause to believe that, any person is violating any discharge regulation or permit condition, the Riparian Review Committee shall cause a prompt investigation to be made.

**904** **Notice of Violation; Cease and Desist Order:** If the Riparian Review Committee finds after an investigation pursuant to Section 903 of this Ordinance that a violation of any regulation or permit condition exists, the Committee shall promptly notify both the alleged violator and the Business Council in writing.

In the case of an apparent violation of this Ordinance, the Riparian Review Committee is authorized to issue a Notice of Violation to the person(s) apparently responsible for the violation, and, if the apparent violation occurred on property owned by a person other than the alleged violator, a Notice of Violation shall also be issued to the landowner.

In the case of a continuing violation or a threatened violation, the Riparian Review Committee is authorized to issue a Cease and Desist Order to prevent the violation from continuing or occurring.

Failure to comply with a Cease and Desist Order shall constitute a violation of this Ordinance. Both a Notice of Violation and a Cease and Desist Order may be issued for a single incident. A Notice of Violation will include a Summons to appear before the Riparian Review Committee at an enforcement hearing at a specified time and date, and shall advise the alleged violator that failure to appear may result in the imposition of civil penalties.

If a Cease and Desist Order is issued without an accompanying Notice of Violation, the Order will inform the recipient that failure to comply with the Order will constitute a violation of this Ordinance which will result in the issuance of a Notice of Violation and may result in the imposition of civil penalties.

**905** **Informal Conferences:** The Riparian Review Committee shall afford the landowner, lesser or lessee, or his or her representative reasonable opportunities to discuss proposed

enforcement actions at an informal conference prior to taking further enforcement action, unless the Riparian Review Committee determines that there may be either imminent environmental damage to a Reservation resource or adverse impact upon the health, safety and welfare of the Reservation population. Informal conferences may be used at any stage in the enforcement proceedings, except that the Riparian Review Committee may refuse to conduct informal conferences with respect to any matter then pending before the Riparian Review Committee or the Tribal Court.

**906 Record Required:** The Riparian Review Committee shall make a written record of the date and place of the conference, the persons in attendance, the subject matter discussed and any decisions reached with respect to further enforcement action.

**907 Enforcement Hearings:** If the landowner and the Riparian Review Committee are unable to resolve the matter via an informal conference, the Riparian Review Committee is authorized to conduct adjudicatory hearings to determine if a violation of this Ordinance has occurred. In such a hearing the designated official or agency, in cooperation with the Tribal Water Quality Control Officer, shall present the case to the Riparian Review Committee to establish that the person(s) charged has (have) committed a violation of this Ordinance. Any person so charged shall be entitled, at his or her own expense, to be represented by an attorney or other representative.

(A) Burden of Proof. The designated official or agency shall have the burden of proving that a violation of this Ordinance has occurred and that a person charged was responsible for the violation. The Riparian Review Committee shall rule that a violation of this Ordinance has occurred if it finds that the charges are supported by substantial evidence and that a preponderance of the credible evidence supports a finding that a violation has occurred.

(B) Enforcement Orders. Within thirty (30) days after the date of any enforcement hearing, the Riparian Review Committee shall issue a written decision. If the Committee determines that a violation has occurred and that the person(s) charged was (were) responsible for the violation, the Committee's decision shall include an Enforcement Order.

**908 Civil Penalties and Corrective Action:** An Enforcement Order shall direct any person(s) found to have committed a violation of this Ordinance to take whatever corrective action the Riparian Review Committee deems appropriate under the circumstances. An Enforcement Order may impose civil penalties in accordance with a schedule of civil penalties prescribed in the Committee's rules. Alternatively, an Enforcement Order may impose civil penalties in the event that a person found to have committed a violation of this Ordinance does not take corrective action in accordance with the Order within a prescribed time frame. If a person

who has been found to have committed a violation does not take corrective action within the prescribed time frame, an appropriate department or agency of the Tribal government may take the necessary corrective action, in which case, the amount of any civil penalty shall be increased by twice the amount of the cost incurred by the Tribal department or agency in taking the corrective action.

(A) Emergency Orders. Notwithstanding any other provision of this Ordinance, if the Riparian Review Committee determines that noncompliance with this Ordinance is presenting an imminent and substantial threat to the public health, welfare or environment and determines, in consultation with the Tribe's attorneys, that it is not practicable to assure prompt protection of the public health, welfare or environment of an administrative or judicial enforcement action under this Part, the Committee may issue such orders as may be necessary to protect the public health welfare or environment. Any such order shall be effective immediately upon issuance and shall remain in effect for a period not to exceed sixty (60) days.

(B) Revocation of Permit. Failure of any person to comply with any Enforcement Orders will result in an immediate revocation of his or her permit. In order to obtain a reinstatement of such permit, the person(s) against whom the Enforcement Order was issued must first demonstrate compliance with the Order and pay all outstanding penalties and then petition for reinstatement of the permit with the Riparian Review Committee.

**909 Judicial Enforcement:** Only the Tribal Court, shall have jurisdiction of all cases and controversies arising under this Ordinance.

(A) The Riparian Review Commission may request the Business Council to authorize the REPA to file an action in Tribal Court pursuant to this Ordinance for a temporary restraining order, a preliminary injunction, a permanent injunction or any other relief provided by law, including the assessment and recovery of civil penalties and clean up and administrative costs associated with the enforcement of this Ordinance (except that any suit against the Tribe or a tribal department or agency shall be for injunctive relief only and not for penalties or other money damages), in any of the following instances:

(1) **whenever** a person has violated, or is in violation of, any provision of this Ordinance, including but not limited to a regulation, permit or order issued pursuant to this Ordinance;

(2) **whenever** a person submits false information under this Ordinance or regulations promulgated under this Ordinance; or

(3) **whenever** a person is creating an imminent and substantial endangerment to the public health, welfare, environment or cultural resources of the Tribe, in which case the Committee shall request the REPA to pursue injunctive relief but not the assessment of penalties, unless the endangerment is caused by a violation, as specified in paragraphs (1) and (2) above.

(B) Any person who in violation of this Ordinance discharges any pollutant into the waters of the Reservation shall be liable for all costs associated with or necessary to clean up, abate or remove said pollutants from the waters of the Reservation and restore the quality of the waters of the Reservation to their condition as they existed immediately prior to the discharge.

**910 Special Provisions for Tribal Departments and Agencies:** In any case in which the Business Council or any Tribal agency or department is alleged to have violated the terms and conditions of a discharge permit, or to have conducted discharge activities without a permit, the Chairperson of the Riparian Review Committee shall bring the matter to the attention of President/Chairperson who shall consider taking action to ensure compliance with this Ordinance. If the matter cannot be resolved informally, the Committee shall conduct an enforcement hearing for the purpose of making factual determinations and issuing a decision recommending a course of corrective action if necessary.

**Section 1000 - Appeals**

**1001 Judicial Review:** Any person who is aggrieved by the issuance or denial of a discharge permit without respect to whether that person, corporation or other entity is a party to such permit application, or who is the subject of an Enforcement Order, may file an appeal with the Tribal Court. The Tribal Court is authorized to hear such appeal, using the substantial evidence standard of review.

**1100 Other Provisions**

**1101 Severability:** If any provision of this Ordinance, or the application thereof, is held invalid, the remainder of this Ordinance, or applications of such provisions, shall not be affected.

**1102 Sovereign Immunity Preserved:** Nothing in this Ordinance is intended to, nor should be interpreted as a waiver of the Tribe's sovereign immunity from unconsented lawsuit, or as authorization for a claim for monetary damages from the Tribe.

## APPENDIX A

# Microcytis Aureginosa Background Information for Justification of Proposed Standards for Human Health

### Cyanobacteria and Associated Toxins

*Microcystis aeruginosa*, a blue-green algal species (cyanobacteria) capable of producing the potent liver toxin (hepatotoxin) microcystin, was recently detected in the lower reservoirs of the Klamath River Hydroelectric Project (Kann 2005). Also in 2005, Klamath River samples as far downstream as the estuary indicated that algal cells are being washed from the reservoirs into the river below and are maintaining viability. Detection of the presence of both cells and toxin well downstream of Iron Gate Reservoir has implications for human and aquatic ecosystem health; therefore, criteria for *Microcystis* and microcystin toxins are recommended. While literature on the effects of microcystin toxins on fish is growing, there is insufficient field data to set thresholds to prevent harm to fish. These toxins have been studied more as serious threats to human health and so limits to *Microcystis* abundance and microcystin toxins are proposed with regard to REC-1 beneficial uses.

*Literature Review*:
Cyanobacteria, also known as blue-green algae, are a diverse group of single-celled aquatic organisms found in surface waters worldwide. Lakes, reservoirs, ponds, and slow-moving rivers are especially well suited to cyanobacteria, and given the right conditions – calm water, light, and abundant nutrients – these organisms can reproduce at a high rate, forming vast blooms in the water. The resulting high cyanobacterial algal concentrations are not only aesthetically unpleasing, but often produce toxins that have been implicated in human health problems ranging from skin irritation and gastrointestinal upset, to death from liver or respiratory failure (Chorus and Bartram 1999, Chorus 2001). *Microcystis aeruginosa* produces the potent hepatotoxin microcystin and has been demonstrated to occur in the Klamath River system (Kann 2005).

These hepatotoxins (liver toxins) are powerful cyclical peptides which disrupt the structure of liver cells, causing cell destruction, liver hemorrhage, liver necrosis, and death (Carmichael 1994). In addition to hepatotoxicity, long-term laboratory animal studies indicate that microcystins act as liver tumor promoters and teratogens (Falconer et al. 1988). Microcystin poisoning has been implicated in the largest number of cyanobacteria-associated animal deaths worldwide, and enough work has been done, both with rodents and pigs, on microcystin effects at various levels of exposure, that the World Health Organization (WHO) has issued a provisional guideline of 1 µg/L for microcystin concentration in drinking water. With actual microcystin concentration data frequently unavailable, alert level guidelines based on cell counts have been established for *Microcystis* (as well as other cyanobacteria) blooms in drinking and recreational

waters (Yoo et al. 1995, Chorus and Bartram 1999).

Although human health effects of toxins from the blue-green algae *Microcystis aeruginosa* are better studied (WHO, 1998), fish health effects have also been recently researched (Zambrano and Canelo 1995, Wiegland and Pflugmacher 2005), including effects on salmonids (Tencalla et al. 1994, Bury et al. 1996; Fischer et al. 2000, Best et al. 2003). We do not propose to set limits for protection of salmonids from microcystin toxins because there are currently insufficient data to understand the threat in the Klamath River. Nonetheless, these effects are discussed here because there is evidence that hepatotoxins created by *Microcystis* are a threat to fish health independently, and may also act synergistically with other water quality problems (i.e. pH) in causing cumulative stress or in contributing to immunosuppression and subsequent outbreaks of fish disease epidemics.

Microcystin toxins accumulate in the liver where they disrupt many different liver enzymes and ultimately cause the liver to break down (Fischer et al., 2000). Algae grazing fish species may be the most susceptible to microcystin poisoning, but other fish may ingest whole *Microcystis* cells or breakdown products from the water column (Wiegland and Pflugmacher 2005). In laboratory experiments, rainbow trout were found to excrete microcystin toxins in bile fluids when exposed to them orally. The toxins caused increased drinking in this species and increased water in the gut, which was a sign of osmoregulatory imbalance and could promote diffusion of toxins into the blood (Best et al., 2003).

Tencalla et al. (1994) noted that large scale fish kills around the world have resulted from microcystin poisoning. They postulated that a 60 g rainbow trout would only have to ingest 0.1-0.4 g of algae (wet weight) or 0.2-0.6% of its body weight to experience massive liver damage. Bury et al. (1996) studied brown trout exposed to sublethal levels of microcystin toxins and found greatly altered blood cortisol levels indicating acute stress and reduced immunosuppression. This is a concern in the mainstem Klamath River because of the recognized fish health problems (Foott and Stone, 2003; Nichols and Foott, 2005), and the potential for additional diminishment of resistance to disease caused by microcystin exposure of juvenile salmonids.

*Patterns in Klamath River Data*

*Microcystis aeruginosa* cell density and microcystin toxin concentration were monitored in the Klamath River system in 2005 by the Karuk Tribe in the hydropower reservoir area and by the Yurok Tribe and USFWS between the reservoirs and the mouth. Concentrations were compared to moderate probability of adverse health effect levels (MPAHEL thresholds) for recreational waters as published in documents for the World Health Organization (WHO) and EPA (Falconer el al. 1999; Chorus and Cavalieri 2000). The MPAEL is 100,000 cells/ml or 20 µg/L microcystin in the top 4 meters of surface waters and the Tolerable Daily Intake (TDI: 0.04 µg kg $bw^{-1}$ WHO 1998) for a 40 lb (18kg) child accidentally ingesting 100 mls of reservoir water on that date.

Copco and Iron Gate Reservoir data clearly show the occurrence of large and widespread blooms of *Microcystis aeruginosa* (MSAE) and microcystin toxin levels in 2005. During the August-September period cell density and toxin levels, exceeded the MPHAEL often by 10-100's of times; likewise, the TDI was commonly exceeded by more than 10-100x throughout the August-September period.

During the same sample dates when in-reservoir data showed substantial MSAE cell density and toxin concentration, the station KRAC had non-detects for both parameters. Thus, for the sampled dates both cell density and toxin data indicate that neither toxin nor MSAE cells were detectable in the Klamath River directly above the reservoirs in 2005.

These data are consistent with literature showing that MSAE and other buoyant Cyanobacteria do not dominate in conditions of turbulent mixing such as that known to occur in the Klamath River above Copco and Iron Gate Reservoirs. For example, Huisman et al. (2004) demonstrate that potentially toxic MSAE dominate at low turbulent diffusivity (calm-stable conditions) when their flotation velocity exceeds the rate of turbulent mixing. Such conditions are more likely to occur in lakes and reservoirs as velocity and turbulence are reduced.

The non-detects at KRAC (above Copco reservoir) even when reservoir stations showed substantial concentrations of both toxin and MSAE cell density, clearly indicate the role of the reservoirs in providing ideal habitat conditions for MSAE. Moreover, as indicated by cell count and toxin data at KRBI (below Iron Gate Dam), the potential exists for export of both cells and toxin to downstream environments. In areas where turbulent diffusivity may decrease as the river widens or such as would occur in backwater areas, the potential exists for high concentrations to occur downstream. In fact, MSAE cell concentration exceeded 1.3 million cells/ml in a backwater area near the confluence of Coon Creek nearly 100 miles downstream from Iron Gate Dam and microcystin levels were as high as 47 µg/L (written communication Yurok Tribe).

*Review of Existing Standards*

EPA currently has no standards for *Microcystis aeruginosa* cell density or microcystin toxin concentration although Cyanobacteria and their toxins are currently on EPA's Contaminant Candidate List 2 (http://www.epa.gov/ogwdw000/ccl/ccl2_list.html). However, the World Health Organization as well as certain states and international countries provide threshold guidelines for MSAE and microcystin. Guidelines from the WHO, Australia, and the State of Oregon are summarized here. The Australian guidelines are the most recently updated and comprehensive

Microcystin poisoning has been implicated in the largest number of Cyanobacteria-associated animal deaths worldwide, and enough work has been done, both with rodents and pigs, on microcystin effects at various levels of exposure, that the World Health Organization (WHO) has

issued a provisional guideline of 1 µg/L for microcystin concentration in drinking water. With actual microcystin concentration data frequently unavailable, alert level guidelines based on cell counts have been established for *Microcystis* (as well as other Cyanobacteria) blooms in drinking and recreational waters (Yoo et al. 1995; Chorus and Bartram 1999).

A Tolerable Daily Intake (TDI) was calculated for microcystin-LR, since this variant has sufficient information to derive a guideline value and is thought to be one of the most toxic variants. A TDI is a level of exposure below which it is thought that no adverse health effects will occur. It is important to note that simply exceeding a TDI does not imply that a health effect is likely. Rather, the duration of exposure and concentration of toxin will be major determinants of toxicity. The basis for the TDI was a 13-week mouse study with observed liver changes (Fawell et al., 1994). The no observed adverse effect level (NOAEL), which was the basis for determining a guidance value, was 40µg microcystin per kg body weight per day. To calculate a TDI, the NOAEL was divided by a series of uncertainty factors to include potential for intra-species variation (factor of 10), interspecies variation (factor of 10) and for a less-than-lifetime study (factor of 10). The equation is:

$$\text{TDI} = \frac{40\ \mu g/kg \bullet day^{-1}}{1000} = 0.04\ \mu g \text{ microcystin-LR per kg body weight per day}$$

The TDI is instrumental in determining guidance for taxa such as Microcystis or Planktothrix that are known to produce microcystins at high intracellular concentrations. Based on this information the WHO guideline for microcystin is 1 µg/L for drinking water.

For accumulations of MSAE in recreational waters, microcystins at sub acute levels may be ingested or inhaled by swimmers, skiers, windsurfers or kayakers. The WHO considers cell densities of 100,000 cells/ml and higher as likely to produce microcystin concentrations of 20 times the WHO 1 µg/L guideline for drinking water. Scum formation is likely at this density, as the concentration of buoyant cells rises and covers the surface. Thus, in documents published for the EPA and WHO (Falconer el al. 1999; Chorus and Cavalieri 2000) a moderate probability of adverse health effect level (MPAEL) is designated when cell density exceeds 100,000 cells/ml or there is 20 µg/L microcystin in the top 4 meters of surface water. The presence of scums indicates a high probability of adverse health effects. However, microcystin toxins can be released into the water, remaining even after the *Microcystis* bloom has visually dissipated either from natural senescence or treatment by algaecides (e.g., copper sulfate); thus, caution should be exercised for drinking and recreational water sources even when no scum or cells may be visible (Lam, et al. 1995).

A recent Australian document entitled Managing Risks in Recreational Waters (National Health and Medical Research Council [NHMRC] 2005) provides a recent compilation and derivation of recreational guidelines for MSAE. Similar to Oregon (Stone 2005), they distinguish between

MSAE and other cyanobacterial species. They define a "Red Level Action Mode" at 50,000 cells/ml of MSAE and 10 µg/L of microcystin, and where water contact avoidance is recommended. Similar to WHO and Oregon, the presence of cyanobacterial scums also warrants a water contact advisory.

*Justification for Recommended Standard*
The above recommended standards for MSAE and microcystin are based upon animal toxicity data for microcystins and incorporates the estimated risk for short term repeated exposure for recreationists (NHMRC 2005) and TDI values for drinking water (Falconer at al 1999).

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