

## **RIVER ZONING PROPOSAL**

### 1. **Background**

The Digest of the River Uruguay, Topic E3 : Contamination, Title 2 Chapter 4 "Water Classification and Standards of Water Quality" Art. 2, defines the most important Legitimate Uses that are accepted for the River Uruguay.

These Uses are:

- Use 1: Raw waters for public consumption with conventional treatment.
- Use 2: Waters for recreation activities with direct contact.
- Use 3: Waters for farming activities.
- Use 4: Waters for the conservation and development of aquatic life.

Use 4 is considered to be a Basic Use and must be observed in the whole River.

For Uses 1, 2 and 3 in Art. 5 it is established that in the waters for such uses the standards established in the CARU Digest must be observed.

Art. 6 establishes that the CARU, in coordination with the competent agencies of the Parties, will determine the zones for such Uses, while respecting the definition of "zone" given in the corresponding paragraph of the section "Definitions", Topic E3, Contamination, in the Digest.

The Digest does not lay down any type of condition for determining these zones, the only restriction being the fact that they may not totally or partially overlap the mixing zones, as stated in Art. 5. of Section 1 of Chapter 5, "Conditions of the Effluent".

Since one of the powers assigned to the CARU (Art 2 d, section 1, Chapter 1, "Competences") is that of proposing to the Parties the zoning of the river, CARU has conducted studies to enable the present proposal for such zoning to be submitted.

## 2. Basic information

Accordingly, the CARU has submitted a note to the competent bodies of the Parties (Mayors' Offices, Municipalities, OSE, DINAMA, etc.), with a view to collecting the necessary information to undertake such zoning.

The information requested is the following:

1. Intake points for the public provision of drinking water and community uses.
2. Recreation zones.
3. Areas of farming activities or irrigation.
4. Areas of industrial provision.
5. Areas of sewage and/or industrial effluent.

The information received and on the basis of which the zoning proposal is made is the following:

### From Argentina:

Municipality of Monte Caseros  
Municipality of Federación  
Municipality of Concordia  
Municipality of Colón  
Municipality of San José  
Municipality of Gualeguaychú  
Municipality of Concepción del Uruguay  
National Parks Administration

### From Uruguay:

Municipal Council of Artigas  
Municipal Council of Salto  
Municipal Council of Paysandú  
Municipal Council of Río Negro  
Municipal Council of Soriano  
Municipal Council of Colonia

Regional O.S.E. of Salto  
Regional O.S.E. of Paysandú  
Regional O.S.E. of Colonia

On the basis of the information submitted, the established .....*ILLEGIBLE*..... have been identified.

## 1. Zones for Use 1. Water Provision

<b>Intake</b>	<b>Volume</b>
• Bella Unión	10 L/s
• Federación	-
• Concordia	41,000 m3/day
• Salto	220 L/s
• Arenitas Blancas	2 L/s
• Colón	5830 m3/day
• Fray Bentos	59 L/s
• Paysandú	246 L/s
• Concepción del Uruguay (1)	28,000 m3/day
• Concepción del Uruguay (2)	-

## 2. Zones for Use 2. Recreation.

The various Mayors' Offices and Municipalities have declared the following coastal areas to be beach zones:

<b>Beach</b>	<b>Department/Municipality</b>
• Beach opposite Isla Brasilera	(Artigas)
• Beaches north of Bella Unión	(Artigas)
• Beaches of Bella Unión	(Artigas)
• Beaches of Federación	(Federación)
• Beaches of Salto	(Salto)
• Resort areas of El Palmar Park	(Colón)
• San José beach resort	(San José)
• Troncos Petrificados beach resort	(San José)
• Beaches Colón Norte	(Colón)
• Beaches Colón Sur	(Colón)
• La Mulata beach	(Paysandú)
• Municipal beach	(Paysandú)
• Park beach	(Paysandú)
• Mayea beach	(Paysandú)
• Club Remeros	(Paysandú)
• Banco Pelay beaches	(Concepción del Uruguay)
• Itapé beaches	(Concepción del Uruguay)
• Nuevo Berlín beach	(Río Negro)
• Beaches at Las Cañas	(Río Negro)
• Beaches at Fray Bentos	(Río Negro)
• Beaches to the south of Fray Bentos	(Río Negro)
• Ñandubayzal beach resort and camp site	(Gualeduaychú)
• Concordia beach	(Soriano)
• La Agraciada beach	(Soriano)

### **3. Establishing zoning criteria**

#### **3.1 Work guidelines**

Since the Digest lays down no conditions for establishing the respective zones of uses 1, 2 and 3, the basic criteria for creating them is hereby set forth.

The following work guidelines have been determined:

- a. The following order of priority is fixed for uses: 1) Use 1, 2) Use 2, and 3) Use 3. This means that if two uses can occur in a single zone, it will be defined in accordance with the priority Use.
- b. The areas defined and allocated to the different Uses represent zones of sanitary security where the Uses must be satisfied.
- c. Within the defined areas for uses 1, 2 and 3 mixing zones will not be allowed. (Art. 5. Section 1-Chapter 5-Title 2 of the CARU Digest).
- d. The areas not defined as of Uses 1, 2 or 3, or as mixing zones, will be defined as zones of Use 4.
- e. Zoning will be represented on maps to a scale of 1/50,000.

#### **3.2 Criteria for the zones**

For a rigorous and scientifically sustainable establishment of criteria in designing these zones, studies such as those defined in the Digest (Title 3, Chapter 1 "Research Activities", Section 1, Art. 1) must be undertaken, i.e.

- a. Study of behaviour of substances that can be discharged into the river.
- b. Tests of acute and chronic toxicity with species of the fauna in the river.
- c. Development of interpretation models of the hydrodynamic behaviour of the river.

Although abundant general information exists, there is no specific information regarding the proposed studies. Therefore, the following criteria are proposed for zoning of the river based on other similar criteria used in different regions of the world, and on knowledge of the river obtained in the studies made by CARU to date.

### 3.2.1 Criteria for Use 1.

The zones will be established according to the definition of zone established in the Digest, by means of a surface area named "security sector" within which the standards of the zone of specific use must be met.

In defining these sectors certain definitions are used that are set forth in Topic E5 "Determining the Stretches of River and Distances within which the Right to Police may be exercised in the jurisdiction of the other Party"; of the Digest of the River Uruguay, adding others for the purposes of creating the zones. These definitions are:

- "Coast": shore of the river at any given time, depending on fluctuations in volume.
- "Distance": the value indicated in metres, measured perpendicularly from each point on the coast or element considered.
- "Length": the value indicated in metres, measured on the coast from a point downstream to a point upstream.
- "Starting point": point downstream from which the length is measured in order to determine the security sector for the various uses.

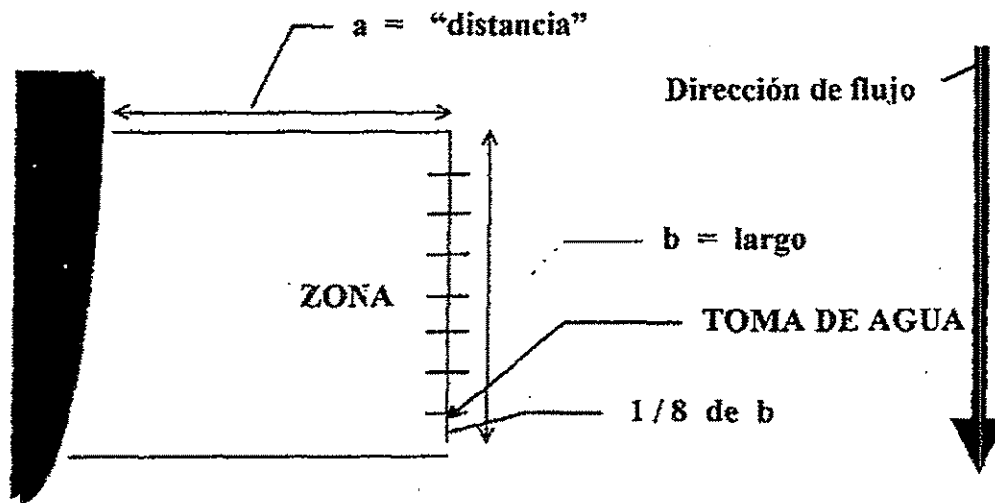
The zones defined for Use 1 correspond to the sanitary sectors deemed necessary to protect water intakes for public provision to population centres.

Therefore, the size of the security sector established will depend in principle on the volume extracted from the river, since the greater the volume extracted the greater the sector should be to ensure the quality of the resource for Use 1.

For the sake of simplicity, the total population of the location supplied is taken as a parameter to define the size of the zone.

The defined sector results from considering the two-dimensional space or area (see graphic attached) which is included within a determined length (b) measured from the starting point, and a distance from the coast (a).

The starting point is located 1/8 (one eighth) of a length, downstream from the intake point in order to allow for the existence of ebb tides that may alter its characteristics.



a = "distance"    direction of flow    b = length    WATER INTAKE    1/8 of b

Graphic 1

The following chart shows the values of a and b for the different population centres.

Locality	Distance "a" (m)	Length "b" (m)
1 – 5000	1000 m or 1/3 stretch*	1200
5000 - 20,000	1000 m or 1/3 stretch*	2000
20,000 – 50,000	1200 m or 1/3 stretch*	3200
50,000 – 100,000	1200 m or 1/3 stretch*	4000
>100,000	1500 m or 1/3 stretch*	4000

\* If the intake is located in an arm of the river, 1/2 of the width of the arm will be taken.

### 3.2.2. Criteria for Use 2

The zones of Use 2 are zones set apart for recreation with direct contact, i.e. bathing. This zone mainly comprises the beaches so the protection zone must be coastal.

Although recreation may be extended to include recreational navigation, it is understood that for this type of recreation the standards of Use 4 grant sufficient protection, so the zones of Use 2 will only cover the beach zones. The sector in this

case is the result of considering a length equal to the length of the beach plus 200 mts, with its starting point 100 mts downstream (measured on the coast). The distance to consider will be 800 mts, or  $\frac{1}{4}$  of the stretch of river, or whichever is lowest.

### 3.2.3. Criteria for Use 3

Understanding that zones of Use 3 are of a private nature and, therefore, no organisations exist to control their installation, it is understood that the criterion to be used for their establishment is that they should be defined upon the request of each user, who, therefore, must be the person to define the protection zone for intake purposes.

Those cases in which it is a public body that promotes the use of water from the river for irrigation shall not be included under this criterion, and the declaration of use 3 will be considered upon request of the petitioning body.

## 4. Mixing zones

### 4.1. Criteria for the mixing zones

Mixing zones are defined as such in paragraph k of the section "Definitions" of the CARU Digest. There they are defined as being the area adjoining the discharge point of an effluent, at which water quality standards cannot be exacted.

Chapter 5 "Conditions of the effluent" contains a series of conditions that should be met by the mixing zones:

1. Mixing zones must not totally or partially overlap the areas determined for Uses 1, 2 or 3.
2. In determining these zones consideration must be given to:
  - a. -The proximity of water intakes for public provision, for irrigation or of areas set aside for recreation activities.
  - b. -The physical and hydraulic characteristics of the stretch of river where the discharge is located.
3. The mixing zone may not be extended:
  - a. -In discharges into the river: transversally more than  $\frac{1}{5}$  of the width of the respective section of the river and longitudinally over 1000mts.
  - b. -In discharges into the arms of the river transversally over  $\frac{1}{3}$  of the width and longitudinally over 1000 mts.

- c. -In discharges into the dam the mixing zone will not exceed an area of a radius of 300 mts.

According to the River Uruguay Digest, Topic E3, Title 2, Chapter 5, Art. 4, CARU must receive prior notification of any decision to adopt a mixing zone made by any of the Parties. Without prejudice to that, if it is of sufficient scope to negatively affect water quality it will be enforced in all aspects relating to the procedure foreseen in articles 7 to 12 of the River Uruguay Statute.

As limits of acute toxicity it proposes 0.3 units of toxicity, and as chronic toxicity 1 unit of toxicity, measured against the most sensitive of at least 3 species (fish, crustaceans and algae).

The establishment of mixing zones should not be interpreted as permitting the indiscriminate discharge of effluent, but as a temporary solution until such time as the party responsible for the discharge is in a position to ensure quality of the effluent with levels equal to or below those established in the CARU Digest for Use 4.

#### **5. The Salto Grande Dam**

It is considered that for zoning purposes the Salto Grande dam should receive special treatment due to its particular characteristics. To that end, it is suggested that this zoning proposal be adopted as indicated in all its paragraphs for the stretch of river from Km. 0 to the Salto Grande dam; from which point said proposal is extensive also to the main volume of the dam, while for the rest of the body of water it is defined as a so-called zone of *ecological sensitivity*, which would embrace the upper and medium thirds of the lateral arms, identified as Arroyos Mandisoví, Itapeby Grande and Chico and Gualeguaycito Grande and Chico, and another of *high ecological sensitivity*, the Mocoretá arm, which is a breeding ground for fish.

For the purposes of preserving the natural conditions that are reflected in the average values in those sensitive areas of the Salto Grande Dam when drafting this zoning proposal, the CARU suggests that water quality in the upper and middle thirds of the mentioned arms, should be maintained by means of the control of discharges, fixing as a criterion that discharge values should not exceed the representative values of the environment based on the information contained in updated field surveys.

For the lower third, the closest to the main course, it is suggested that its quality should be similar.

## **5. Zoning**

Since CARU has no power to define the different zones on the basis of maps, considering the data provided by the different Municipalities, it is understood that the task of the Subcommittee of Contamination is at an end, establishing the zones and criteria used without specifying the geographical points corresponding to each one.