ENVIRONMENTAL ZONING

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6. ENVIRONMENTAL ZONING

The environmental zoning identifies the importance and / or environmental sensitivity of the abiotic, biotic and socioeconomic units compared to the environment without a project, in the area of influence that includes the present modification. The general location of the project is presented in Figure No. 6.1.

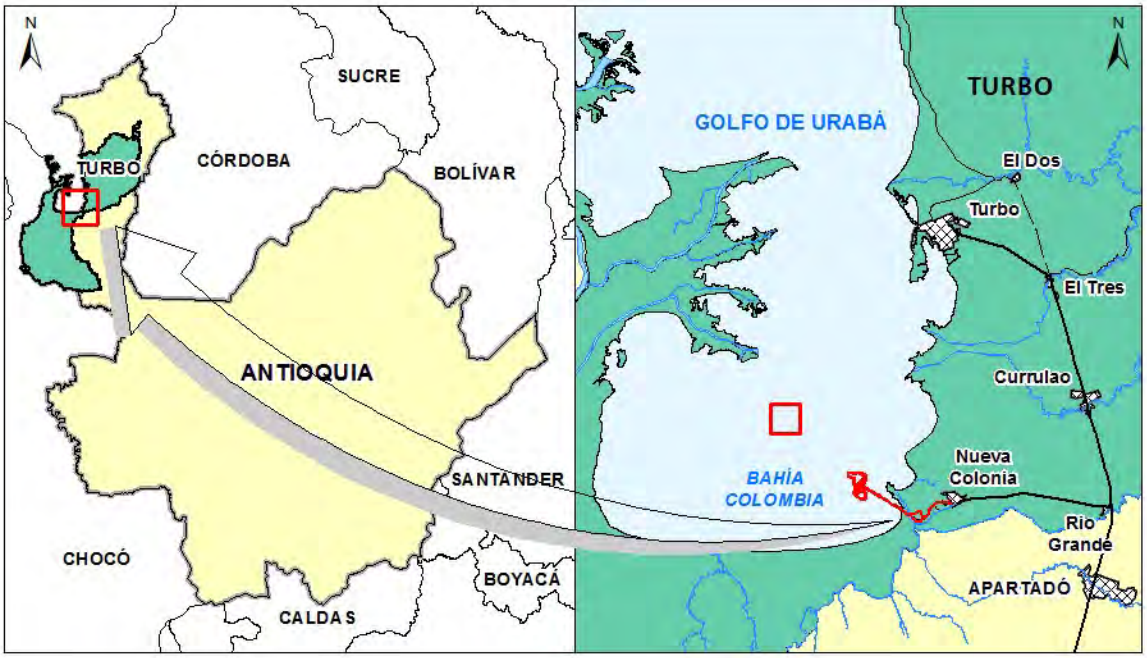


Figure No. 6.1 General project location
Source: Made by: Aqua & Terra Consultores Asociados S.A.S., 2015

Following the methodology presented in chapter 2 of generalities, Figure No. 6.2 presents the methodological summary used for environmental zoning.

Once the abiotic, biotic and socioeconomic media were characterized, environmental zoning was carried out, identifying the aspects of environmental interest that allowed to delimit those areas that presented the greatest threat to the actions generally of anthropogenic and natural origin, that could induce or aggravate situations or very sensitive states of the natural and / or human environment, taking as reference the current conditions of it. This zoning is the basic input for the ordering and planning of the area.

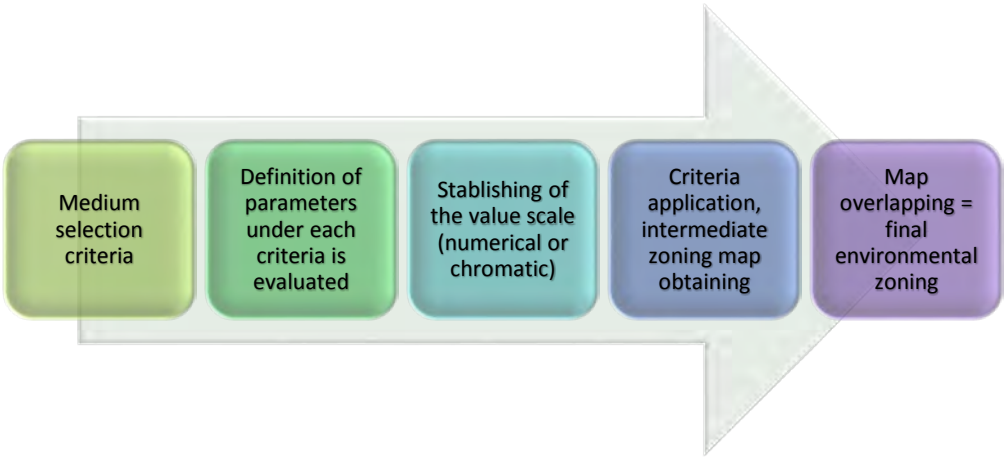


Figure No. 6.2 Methodological summary used for the environmental zoning of the project
Source: Made by: Aqua & Terra Consultores Asociados S.A.S., 2015

6.1 Selection and definition of criteria

Criteria and variables that are easily quantifiable and mapped were selected, which in turn allowed us to represent the current state of the environmental goods and services that are part of the area of influence of the project.

To obtain a synthesis of the territory in terms of environmental importance and / or sensitivity, the variables selected in each of the media are described below, detailing the established criteria and their respective rating scales.

6.1.1 Abiotic criteria

Based on the characteristics of the study area, the criteria and establishment of the scale for the abiotic environment were defined and selected, which was carried out under the framework of geotechnical stability, susceptibility of the morph dynamic processes and / or recovery areas., susceptibility to geohazards and / or risk areas, visual quality of the landscape, conflict over land use, surface hydrogeology, continental water quality and offshore water quality.

In this regard, the selected criteria are presented below, once different analyzes of the qualities of the study area have been carried out.

- *Geotechnical stability*

According to the geotechnical information obtained in the field perforations and the results of the laboratory tests carried out for each of the samples collected at different depths (chapter 5, number 5.1.10), a stability analysis of the area of intervention of the project was carried out in terms of material resitance.

Therefore, five (5) categories were established for the results of geotechnical zoning for a depth between 0 - 40 m, as shown in Table No. 6.1 below.

Table No. 6.1 Degree of sensitivity and assessment of the geotechnical stability criterion

Zoning criteria	Degree of sensitivity	Assessment
Areas with very low stability (Very unstable). The areas with resistance of **the Very Soft material** are considered	Very high	5
Areas with low stability (Unstable). The areas with resistance of the **soft material** are considered	High	4
Areas with medium stability (medium stability). It is considered the areas with resistance of the **material little Compact and Compact**.	Moderate	3
Areas with high stability. (Stable). It is considered the areas with resistance of **the material Very Compact**	Low	2
Areas with high stability. (Very stable). The areas with **hard material** strength are considered	Very low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Susceptibility of morph dynamic processes and / or environmental recovery areas*

The study area is influenced by different processes, which vary the geomorphology of the area, according to the dynamics existing in Bahía Colombia. Next in Table No. 6.2 the criteria and the established valuation according to the baseline of the project are presented.

Table No. 6.2 Degree of sensitivity and assessment of susceptibility criteria of morph dynamic processes

Zoning criteria	Degree of sensitivity	Assessment
Areas with susceptibility to erosion	High	4
Areas with susceptibility to sedimentation	Moderate	3
Areas without erosion and sedimentation processes	Very low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Susceptibility to geohazards and / or risk areas*

The geomorphology of the study area is framed in the floodplains of the León River, where surfaces with flat topography are presented, which makes the area very sensitive to flood threats. Table 6.3 shows the evaluation criteria according to the characteristics of the project.

Table No. 6.3 Degree of sensitivity and assessment of the criterion of susceptibility to geohazards

Zoning criteria	Degree of sensitivity	Assessment
Areas susceptible to breaks and floods	Very high	5
Areas susceptible to fluvial-offshore flood	High	4
Areas susceptible to river flood	Moderate	3
Areas susceptible to alluvial flood	Baja	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Visual quality of the landscape*

From the information of the landscape units identified for the project, they were classified in terms of visual quality and scenic integrity according to their current state of altered and unaltered conditions that qualify the beauty of the landscape. For this variable, five (5) categories or ranks were considered, which will be classified as follows, as presented in Table No. 6.4.

Table No. 6.4 Degree of sensitivity and assessment of the visual quality criteria of the landscape

Zoning criteria	Degree of sensitivity	Assessment
Presence of unaltered landscape units	Very high	5
Presence of landscape units that seem unaltered	High	4
Presence of slightly altered landscape units	Moderate	3
Presence of moderately altered landscape units	Low	2
Presence of highly altered landscape units	Very low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Conflict over land use*

The conflict of land use corresponds to the discrepancy between the current use of the land and the use that it should have according to its potential, vocation and environmental restrictions for the area of influence of the project. For this variable, three (3) categories or ranks were considered, which will be classified as follows, as presented in Table No. 6.5.

Table No. 6.5 Degree of sensitivity and assessment of the conflict criterion for land use

Zoning criteria	Degree of sensitivity	Assessment
Areas with soil conflict due to overuse	Very high	5
Areas with soil conflict due to underutilization	Moderate	3
Areas without soil conflict	Very low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Surface hydrogeology*

According to the geophysical information for the study area, from a mechanical exploration carried out directly in the area of influence and with general information from the Colombian Geological Service, National University of Colombia and CORPOURABÁ, a conceptual hydrogeological model was obtained.

In this sense, for this variable two (2) categories or ranks were considered, which will be classified as follows, as shown in Table No. 6.6.

Table No. 6.6 Degree of sensitivity and assessment of the criterion of surface hydrogeology

Zoning criteria	Degree of sensitivity	Assessment
Areas of greatest hydrogeological interest. Confined and semi-confined aquifers	High	4
Areas of low hydrogeological interest.	Low	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Physicochemical quality of continental and offshore water*

Based on the results of the sampling carried out to determine the physicochemical and bacteriological characteristics of the main channel of the area of influence (Chapter 5 number 5.1.6), the Water Quality Index - ICA was calculated, by means of which the quality of the water is determined. the same, according to the variables defined for said index.

It is worth mentioning that the two (2) stations presented different categories of the quality index, therefore, an average of the ICA with which the entire section of the León River was rated was made.

For the offshore water column, the physicochemical and bacteriological characteristics in the area of influence were also determined (Chapter 5 number 5.1.9), the ICAM Offshore and Coastal Water Quality Index was calculated, which is

a single expression is determined the quality of it according to the variables defined for said index.

It is worth mentioning that an average of the results of the ICAM was carried out, from the stations closest to the intervention area of the deepening dredging activity (5 stations), since these stations presented different categories of the quality index.

Therefore, in Table No. 6.7 the five (5) categories defined for the qualification in terms of sensitivity are presented, according to the results of the quality indexes for inland waters (ICA) and offshore (ICAM).

Table No. 6.7 Degree of sensitivity and assessment of the physical-chemical quality criterion of continental water

Zoning criteria	Degree of sensitivity	Assessment
Pollution level "Excellent" - "Optimal" Range 90-100	Very high	5
Pollution level "Good" - "Adequate" Rank 70-90	High	4
Pollution level "Medium" - "Fair" Range 50-70	Moderate	3
Pollution level "Bad" - "Inadequate" Range 25-50	Low	2
Level of contamination "Very Bad" - "Terrible" Range 0-25	Very low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Qualification of environmental sensitivity for the abiotic environment*

The following is the range of qualification for the abiotic environment, once the established criteria have been assessed.

Table No. 6.9 Rating range of abiotic medium sensitivity

Rank	Abiotic sensitivity
0 - 6	**Very low**
7 – 13	**Low**
14 – 20	**Moderate**
21 – 27	**High**
28 - 33	**Very High**

Source: Delgado (2013), Adapted Aqua & Terra Consultores Asociados S.A.S., 2015

- *Results of the abiotic environmental zoning*

The intermediate environmental zoning of the abiotic environment was made with the area of influence of the soil components, geology, geomorphology, geotechnics, landscape, water uses, water quality and continental and offshore sediments, where this area has the all the information on the environmental characterization of the area of influence.

For the above and in accordance with the superposition of the layers with the geographic information system - GIS, of each of the criteria defined as geotechnical stability, the susceptibility of morph dynamic processes and / or risk areas, degree of visual quality of the landscape, degree of conflict due to land use, surface hydrogeology, physicochemical quality of the continental and offshore water, a low environmental sensitivity was presented in the area of influence, represented by 637.4 ha, equivalent to 51.5%; for a moderate environmental sensitivity, an area of 599.1 ha equivalent to 48.4%; and a high environmental sensitivity, represented by 1.1 ha equivalent to 0.1%; where the environmental sensitivity Low, followed by Moderate, represented the highest percentage of the area, with 99.9% of the total area of influence of the project.

From the above, this result of the intermediate environmental zoning of the abiotic environment was expected, since the area of influence of the project is an area that has been intervened by man by the activities of the region, where the use of the soil currently presents the project site, has a livestock use of intensive and semi-intensive grazing, without conflict, additionally the water quality of the Leon River is bad and very bad due to the discharges of wastewater and the activity of constant dredging , that due to climatic factors vary the quality conditions of the offshore water in Bahía Colombia.

Below are the results for each of the criteria evaluated and then the final weighted map of the environmental zoning of the abiotic environment (Figure No. 6.3 and map MOD_LA_PTO_ANT_47_ZA_Abiotico).

Table 6.10 presents the results obtained, according to the characteristics of the area of influence that were taken into account for the classification of environmentally sensitive areas in the abiotic environment.

Table No. 6.10 Analysis of abiotic environment sensitivity results

Analysis of Environmental Sensitivity	Sensitivity	Rating range
The area with the High Environmental Sensitivity for the abiotic environment was presented in 1.1 ha of the area of influence evaluated, mainly due to the influence of the morph dynamic processes with areas susceptible to erosion, which appeared on the right bank of the riverbed. of the León River, which in turn this area was rated with an average stability, since it was considered that the strength of the material in this area was not compact and compact,	**High**	21 – 27

Analysis of Environmental Sensitivity	Sensitivity	Rating range
according to the analysis of the material of the perforations made for a depth between 0 and 40 m.		
The area with Moderate Environmental Sensitivity was presented in 599.1 ha of the area of influence evaluated, due to the presence of areas with susceptibility to natural phenomena such as breaks and floods on the left bank of the León River, river and offshore flooding, areas with land use conflicts due to severe overuse since the land use is livestock with a cover of clean pastures and the vocation of land use is protective forest. On the other hand, the terrestrial areas also showed a moderate sensitivity with respect to the areas with hydrogeological interest, since these areas are classified as confined and semi-confined aquifers, which are areas more vulnerable to contamination by infiltration of pollutants. Additionally, in the offshore area it obtained a behavior with a moderate sensitivity, influenced mainly by the very low or very unstable geotechnical stability, since it has areas with very soft material resistance.	**Moderate**	19 – 24
The area with the Low Environmental Sensitivity in the abiotic component is 637.4 ha, because the study area is intervened not only for anthropogenic causes but also for natural phenomena such as constant floods, the formation of accretion and erosion processes generated by climate changes, which has led to areas being less sensitive to changes. Another factor with low sensitivity due to anthropogenic causes is the water component, because of the contamination that it presents due to the constant activities of the dredging of maintenance on the rivers León River and the Canal Nueva Colonia, for the transit of the banana convoys towards the anchorages authorized, which are located in the offshore part of Bahía Colombia. According to the results obtained in the baseline, the offshore and fluvial waters presented contamination in some physicochemical and bacteriological parameters, because the León River is a recipient of dumping generated by the communities settled on the banks of the river and by runoff with contents of agrochemicals, which reach the channel and these, in turn, flow into Bahía Colombia, which makes the water component less sensitive to any anthropic activity. On the other hand, the site where the project is located has been an authorized site for 20 years for the disposal of dredging material from the León River, which has allowed it to counteract the phenomenon of erosion.	**Low**	9 – 18

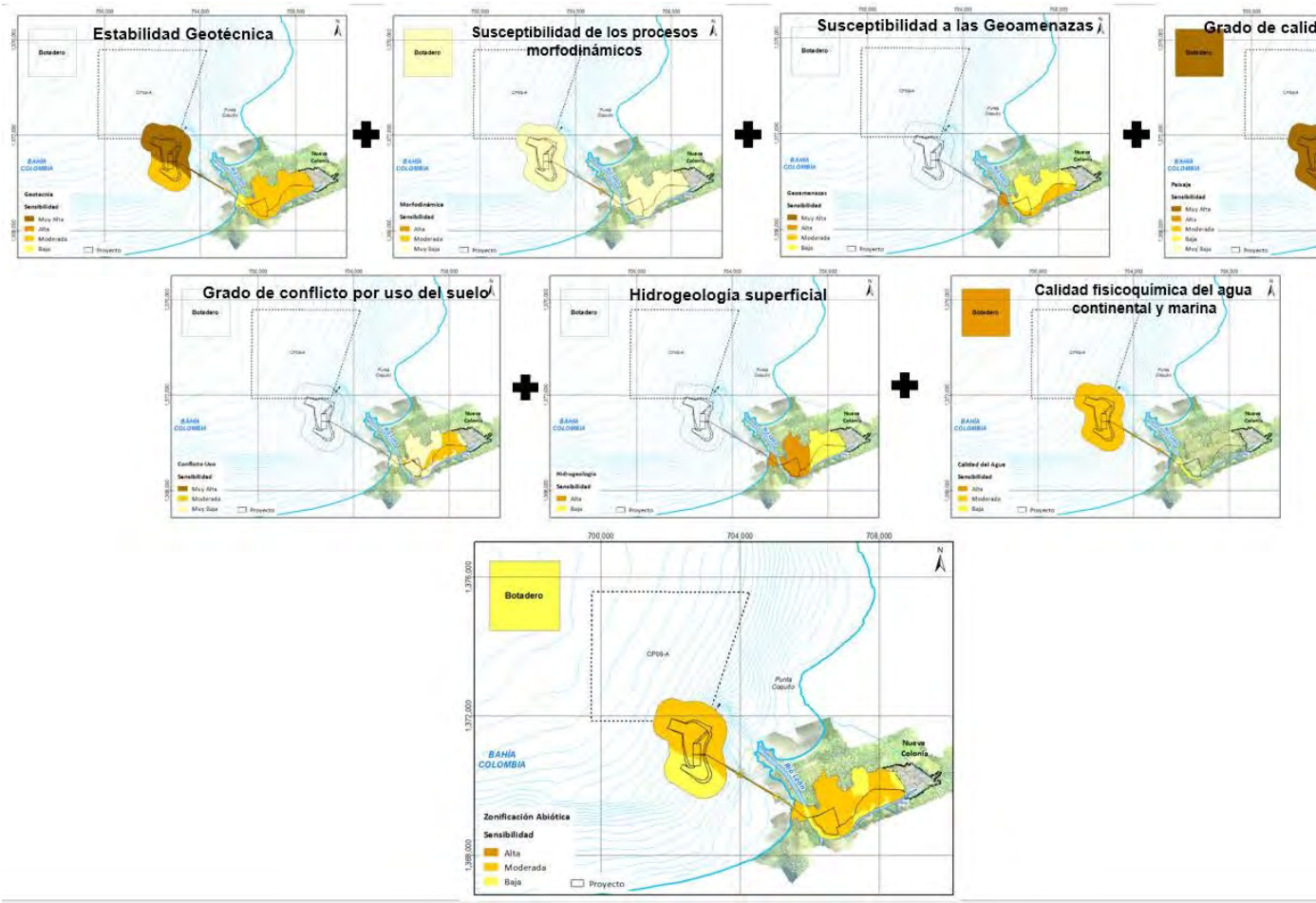


Figure No. 6.3 Result of the Abiotic Environmental Zoning

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

6.1.2 Biotic criteria

The selection and definition of criteria and establishment of the scale for the biotic environment, was carried out under the framework of the unit covers, areas of special ecological importance and elements with special sensitivity. In this way, the selected criteria are presented below, once different analyzes of the qualities of the area have been carried out.

- *Biotic importance of vegetation and land cover*

According to the coverages identified in the baseline, the assessment and degree of sensitivity of these are presented below (Table No. 6.11), according to the conditions of the area of influence.

Table No. 6.11 Degree of sensitivity and assessment of the criterion of biotic importance of vegetation and land cover

Zoning criteria	Degree of sensitivity	Assessment
Dense high mangrove, rivers, seas and oceans.	Very High	9
Forest of gallery and riparian, palms and secondary high vegetation.	High	8
Plantation of Broad-leaved tree, low secondary vegetation, dense grassland of non-wooded mainland, dense wooded land with wooded land, dense flooded grassland not wooded, arracachal and fern.	Moderate	5
Banana and plantain, clean pastures, wooded pastures, open shrubs.	Low	3
Continuous urban fabric, discontinuous urban fabric, industrial zones.	Very Low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Presence of areas of special ecological importance*

Following the definition of the areas of special ecological importance set out in the terms of reference, namely: "... such as protected natural areas, reserves of civil society, integrated management districts, sensitive ecosystems, hydrographic rounds, biological corridors, presence of areas with endemic, threatened (endangered, critically endangered and vulnerable) species in accordance with Resolution number 0192 of 2014 or that regulation that modifies, replaces or repeals it, areas of importance for breeding, reproduction, feeding and nesting, and areas of passage of migratory species. In the environmental baseline, the presence of endemic and / or threatened species, strategic, sensitive ecosystems and / or protected areas was identified (Protective Forest Reserve of the wetlands between

the León and Suriquí rivers). In view of the above in Table No. 6.12, the assessment and degree of sensitivity for this criterion is presented.

Table No. 6.12 Degree of sensitivity and evaluation of the criterion presence of areas of special ecological importance

Zoning criteria	Degree of sensitivity	Assessment
Presence of areas of special ecological importance	Very High	8
Absence of areas of special ecological importance	Low	3

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Presence of conservation objects and conservation / preservation areas*

Following the environmental baseline, four (4) conservation objects were identified for the area of influence of the project: coastal lagoons and estuaries, panganales, coarse-grained, non-carbonated mobile funds of the sub-littoral and carbonated coarse-grained mobile funds of the sub-littoral. Below is the assessment and degree of sensitivity for this criterion (Table No. 6.13).

Table No. 6.13 Degree of sensitivity and assessment of the criterion presence of conservation objects and conservation / preservation areas

Zoning criteria	Degree of sensitivity	Assessment
Presence of areas of conservation objects and conservation / preservation areas	High	7
Absence of areas of conservation objects and conservation / preservation areas	Low	3

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Coastal Environmental Unit Zoning of Darién*

In accordance with the exercise to establish guidelines and strategies for the integrated management of the environmental Darien coastal unit, in the area of influence, seven (7) management categories were identified according to the environmental zoning established therein, namely: industrial development, port and of services, sustainable use for transport, sustainable use for transport and artisanal fishing, port development, transport, mines, energy and interconnections, recovery of strategic ecosystems, sustainable agricultural production, protection. Below is the assessment and degree of sensitivity for this criterion (Table No. 6.14).

Table No. 6.14 Degree of sensitivity and assessment of the zoning criterion Coastal Environmental Unit of Darién

Zoning criteria	Degree of sensitivity	Assessment
Protection.	Very High	9
Recovery of strategic ecosystems.	High	8
Sustainable agricultural production, sustainable use for transport and artisanal fishing.	Moderate	3

Zoning criteria	Degree of sensitivity	Assessment
Industrial, port and services development, sustainable use for transport, port development, transportation, mines, energy and interconnections.	Low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Qualification of environmental sensitivity for the biotic environment*

The following is the rank of qualification for the biotic environment, once the established criteria have been punctuated.

Table No. 6.15 Rating range of the sensitivity of the biotic medium

Rank	Biotic sensitivity
0 – 6	**Very Low**
7 – 13	**Low**
14 – 20	**Moderate**
21 – 27	**High**
28 – 33	**Very High**

Source: Delgado (2013), Adapted Aqua & Terra Consultores Asociados S.A.S., 2015

- *Results of biotic environmental zoning*

Below are the results for each of the criteria evaluated and then the final weighted map of the environmental zoning of the biotic medium (Figure No. 6.4, map MOD_LA_PTO_ANT_48_ZA_Biotico).

Table 6.16 presents the characteristics that were considered for the identification of environmental sensitivity in the biotic environment.

Table No. 6.16 Analysis of the results of the sensitivity of the biotic environment

Sensitivity analysis	Sensitivity	Rating range
The area with very high environmental sensitivity in the biotic component is 11.9 ha, corresponding to the mangrove zone and the protective forest reserve, whose zoning was supported by the four (4) evaluated criteria: vegetation and land cover, areas of special ecological importance, conservation objects and the zoning of the UAC-Darien.	**Very High**	28 - 33
The area with high environmental sensitivity in the biotic component is 225.6 ha, corresponding to the secondary vegetation of the mangrove zone, the palm tree cover and riparian forests, whose zoning was supported by the four (4) criteria evaluated: vegetation and land cover, areas of special ecological importance, conservation objects and the zoning of the UAC-Darien.	**High**	21 - 27
The area with moderate environmental sensitivity in the biotic component is 952.5 ha, corresponding to slightly more disturbed areas such as shrubs, grasslands, offshore and river areas with doubtful	**Moderate**	14 - 20

Sensitivity analysis	Sensitivity	Rating range
water quality, these results are supported by the four (4) criteria evaluated: vegetation and land cover, areas of special ecological importance, conservation objects and the zoning of the UAC-Darien. The area of influence of the project in relation to the biotic environmental sensitivity, is mostly represented in moderate sensitivity with 77% in relation to the whole area.		
The area with low environmental sensitivity in the biotic component is 47.6 ha, corresponding to intervened areas, said results are supported by the four (4) evaluated criteria: vegetation and land cover, areas of special ecological importance, objects conservation and zoning of the UAC-Darien.	**Low**	7 - 13

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

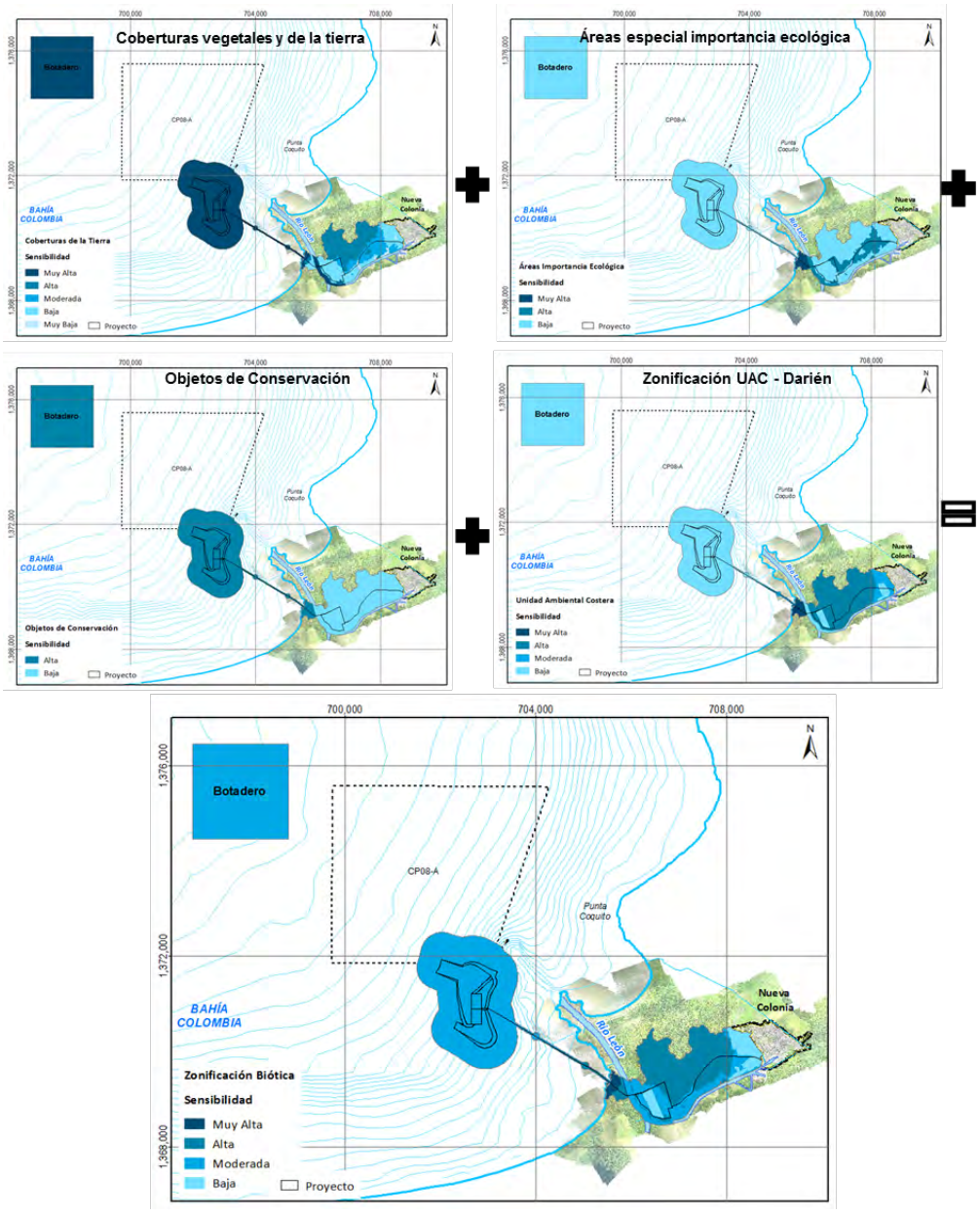


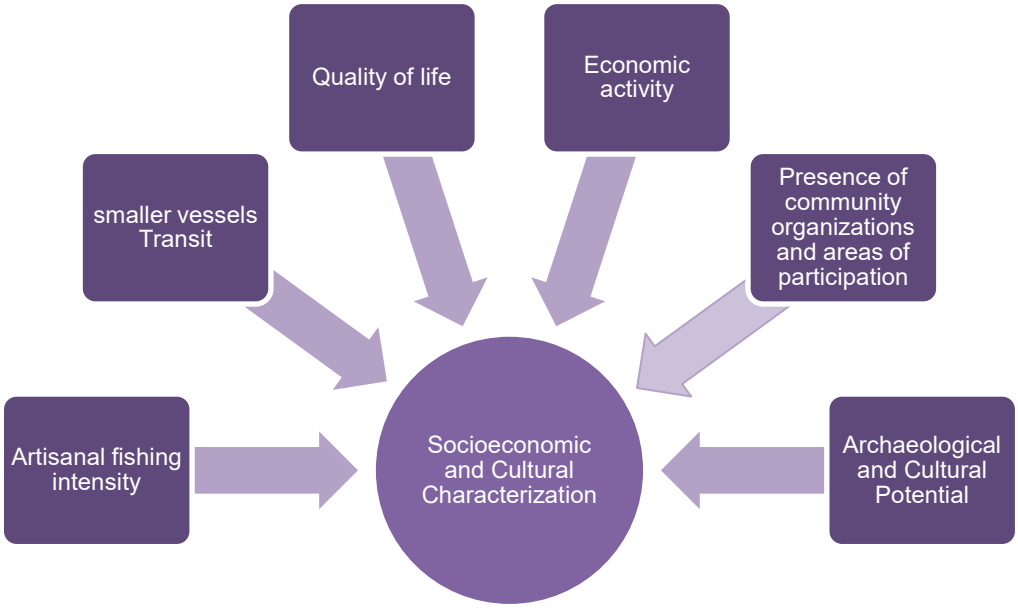
Figure No. 6.4 Result of biotic environmental zoning
Source: Aqua & Terra Consultores Asociados S.A.S., 2015

6.1.3 Socio-economic criteria

The zoning of the social component aims to express the sensitivity of the communities present in the area of influence of the project, in terms of quantifiable

criteria and that may represent vulnerability to receive impacts due to the execution of project activities.

The selection and definition of criteria and establishment of the scale for the socioeconomic environment, was made considering the characterization carried out in the Minor Territorial Unit, represented by the communities of the Nueva Colonia Township and the El Canal settlement. (Figure No. 6.5).



Sensitivity criteria.
Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Artisanal fishing intensity*

According to the results obtained from the socioeconomic characterization carried out, the development of occasional artisanal fishing activities by fishermen in the area is identified.

Artisanal fishing is defined as an activity developed through traditional techniques without technological tools that allow unproductive fishing for the fishing sector; although it handles resource surpluses, these are generally not of the best quality and therefore their marketing chains are not very broad. Generally, the resources

obtained from fishing activities are destined to self-consumption and retail sale in landing areas.

For this criterion, the information obtained was obtained through sampling carried out in the area of influence of the project (socio-economic characterization of the EIA). To define the sensitivity level of this criterion, artisanal fishing intensity was considered in the project area, according to the guidelines used by INVEMAR to identify fishing intensity, in accordance with the following ranges (Table No. 6.17).

Table No. 6.17 Degree of sensitivity and assessment of the criterion of artisanal fishing activities

Zoning criteria	Degree of sensitivity	Assessment
Greater intensity of artisanal fishing per km^2 from 4 to 6 tasks / $km.^2$	Moderate	4
Less intensity of artisanal fishing per km^2 from 0 to 3 tasks / $km.^2$	Baja	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Transit of smaller vessels*

The transit of smaller vessels is defined as free circulation without specific provisions of maritime routes of smaller vessels engaged in the development of multiple activities.

The extent and intensity of transit areas depends on factors such as currents, waves and tides. In the same way, the greater use of transit areas is related to the proximity to artificial canals and rivers, as well as the freely established routes for the development of activities of transport of people, development of commercial activities on a smaller scale and artisanal fishing activities.

Considering the collection of primary information through vessel monitoring carried out in the area of influence of the project in the socio-economic characterization chapter, zoning criteria will be taken into account, areas of greater or lesser use for the transit of vessels. minors, using the area of influence as a route of passage for the development of economic activities such as fishing, transportation of personnel and cargo to the surrounding areas (Table No. 6.18).

Table No. 6.18 Degree of sensitivity and assessment of the criterion of transit of smaller vessels

Zoning criteria	Degree of sensitivity	Assessment
Areas of greatest use for the transit of smaller vessels in the area of influence.	Moderate	4
Areas of least use for the transit of smaller vessels in the area of influence.	Low	1

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Quality of life*

One of the basic approaches to defining the poverty condition of a household is based on the Unsatisfied Basic Needs Method - NBI, which defines its causes and the type of policies considered most appropriate to combat them in a given territory.

The NBI index is defined as the quality of life of people and / or households that have one or more of the needs defined as basic, aiming to survive in the society to which the household belongs.

These needs include housing infrastructure conditions and are complemented by indicators of economic dependence and school attendance.

According to the DANE 2005[1], the NBI of the population, are determined through indicators such as inadequate housing, housing with critical overcrowding, housing with inadequate services, housing with high economic dependence, housing with school-age children who do not attend school and dwellings in misery (those people or households that have more than two needs defined as basic).

In this way, the NBI is considered, of the smaller territorial units, taking into account additionally the coverage of domiciliary and social public services.

It is understood by domiciliary public services: aqueduct, sewerage, electric power, gas, telephony and garbage collection.

Social services: Infrastructures in health, education, training for work, recreation, type of housing, transportation, nucleated centers, media and market places (Table No. 6.19).

Table No. 6.19 Degree of sensitivity and assessment of the quality of life criterion.

Zoning Criteria	Degree of sensitivity	Assessment
NBI between 0 – 35	High	8
NBI between 36 – 75	Moderate	4
NBI between 76 – 100	Low	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Economic activity*

The economic activities developed in the study area and its relation to the vegetation cover and the identified land uses are defined below (Table No. 6.20), for which the area will be classified into:

- Intensive use areas: Urban and agricultural areas - semi-permanent and intensive permanent crops, forestry - production
- Areas of semi-intensive use: Livestock Area - intensive and semi-intensive grazing
- Areas of low use: when the identified areas do not obtain any benefit, such as: Forestry - Protection and conservation - recovery

Table No. 6.20 Degree of sensitivity and assessment of the economic activities criterion

Zoning criteria	Degree of sensitivity	Assessment
Areas of Intensive use	High	8
Areas of semi-intensive use	Moderate	4
Low usage areas	Low	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Presence of community organizations and areas of participation*

This criterion refers to the presence of grassroots, legally constituted organizations with the capacity to manage in the communities that are part of the area of influence of the project.

Table No. 6.21 Degree of sensitivity and assessment of the criterion presence of community organizations and areas of participation

Zoning criteria	Degree of sensitivity	Assessment
There are grassroots organizations in the smaller territorial units with management capacity	High	5
Absence or scarcity of grassroots organizations in the smaller territorial units with management capacity	Low	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Archaeological potential*

This criterion refers to the presence or absence of archaeological material with potential to be rescued and monitored. Table 6.22 shows the scale of values with which this criterion is defined.

Table No. 6.22 Absence and / or presence of archaeological material in the project area

Zoning criteria	Degree of sensitivity	Assessment
High archaeological potential in the project area	High	5
Low archaeological potential in the project area	Low	2

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

- *Qualification of environmental sensitivity for the socioeconomic environment*

Below is the rank of qualification for the socioeconomic environment, once the established criteria have been punctuated.

Table No. 6.23 Rating range of the sensitivity of the socioeconomic environment

Rank	Socioeconomic sensitivity
0 – 6	**Very Low**
7 – 13	**Low**
14 – 20	**Moderate**
21 – 27	**High**
28 – 34	**Very High**

Source: Delgado (2013), Adapted Aqua & Terra Consultores Asociados S.A.S., 2015

- *Results of socio-economic environmental zoning*

Below are the results for each of the criteria evaluated and then the final weighted map of the environmental zoning of the socioeconomic environment (Figure No. 6.6 and map MOD_LA_PTO_ANT_49_ZA_Social).

The environmental zoning of the socioeconomic environment was made starting from the area of common influence, considering the economic activities that were identified in the area, the standard of living of the population identified in the territorial units, the development of economic and cultural activities in the offshore area, as well as the identification of the archaeological potential in the area and the presence of community organizations.

According to the superposition of layers through the geographic information system - GIS of each one of the defined criteria, a moderate environmental sensitivity was presented represented in 75.5 ha with a percentage of 7.4%, represented in the areas where the human settlement of Nueva Colonia is located, considering the levels of NBI reported and the development of economic activities.

There was a low environmental sensitivity represented by 111.9 ha, corresponding to 11.0% of the total area of influence. This degree of sensitivity is mainly present in the offshore areas where small-scale fishing activities are occasionally carried out by the communities of Nueva Colonia and El Canal, as well as the transit of small

vessels and an archaeological potential is presented. a low sensitivity. It was presented, a very low sensitivity represented in 833.8 ha corresponding to 81.7% of the total area evaluated.

Considering the results of the socio-economic environmental zoning, the low level of economic and cultural activities developed in the area is highlighted, especially in the offshore area, which is used to a greater extent as a passage zone for boats that carry out their activities of fishing in the delta of The León River and fishing grounds identified in remote areas as recorded in the document of socio-economic characterization of fishing grounds.

Table 6.24 shows the characteristics that were considered for the identification of environmental sensitivity in the socioeconomic environment.

Table No. 6.24 Analysis of the results of the sensitivity of the socioeconomic environment

Sensitivity analysis	Sensitivity	Rating range
There is greater sensitivity in the area where human settlements are located in the area, due to the population's living standards and the development of economic activities.	**Moderate**	14 – 20
Areas with low sensitivity are presented, due to occasional artisanal fishing activities developed in the area, as well as the transit of minor vessels reported in the area. In response to the artisanal fishing activities carried out in the area of offshore influence of the project, it is considered that the intensity of artisanal fishing in the area presents low sensitivity levels due to the absence of fishing grounds and areas of considerable aggregation of fish represented in the low number of fishing operations reported per km.2	**Low**	7 – 13
Low use of the zone is reported as a transit route for smaller vessels. It is necessary to highlight that due to the diversity of possibilities for carrying out activities of navigation in the open sea, it is not possible to establish transit routes, except those defined for the navigation of large vessels through the navigation channels established by the maritime authorities. This criterion is established based on the vessels registered in transit through the monitoring carried out in the zone where it is established that this reports a low use for the transit of smaller vessels. Faced with the archaeological potential of the area, there are no declarations of areas with archaeological potential, nor reported findings; no areas of interest for shipwreck species have been registered for the maritime zone; with respect to the terrestrial zone, since it corresponds to a recently emerged zone derived from sedimentation processes and flood and swamp zones, the presence of archaeological remains is not viable.	**Very Low**	0 - 6

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

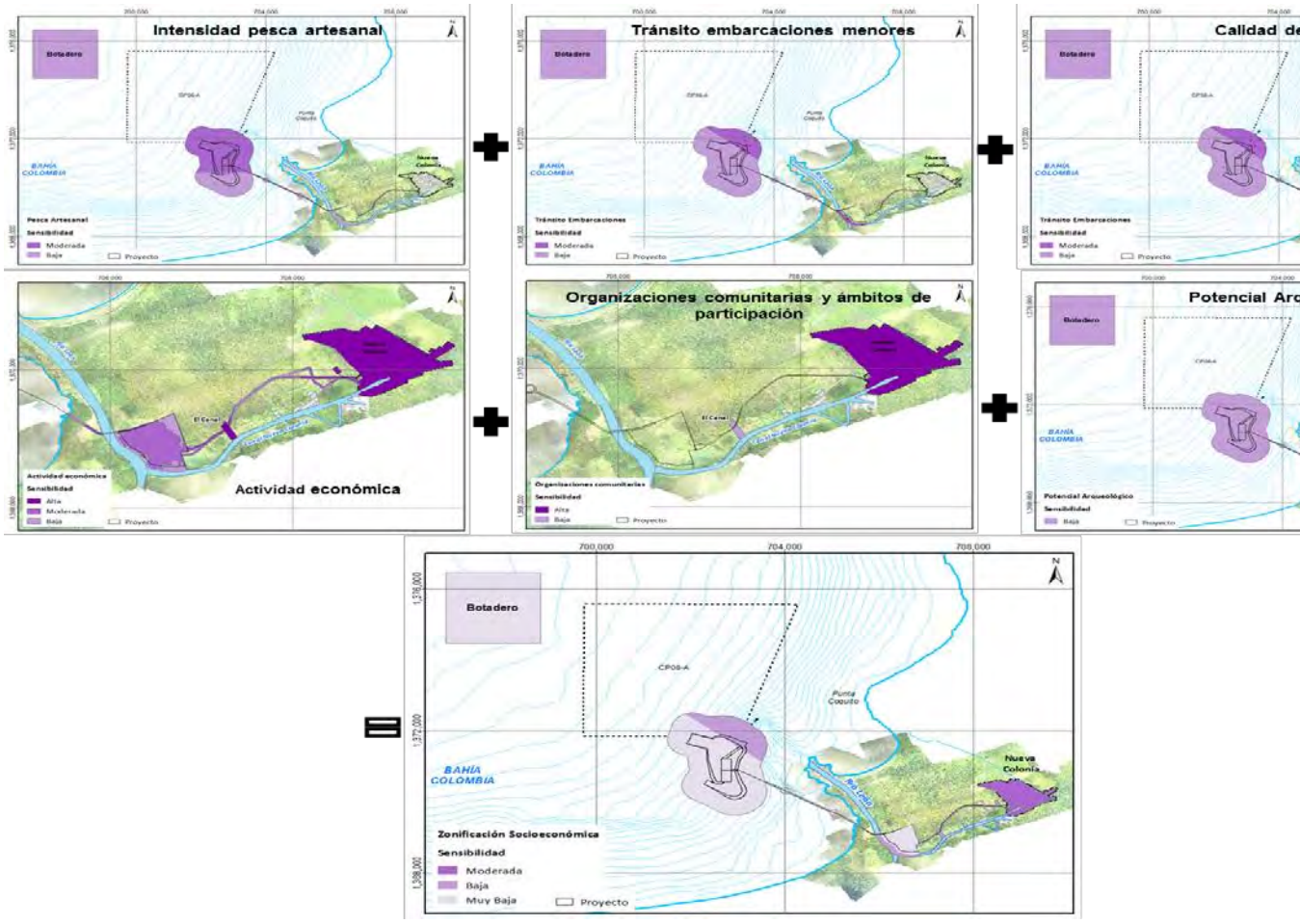


Figure No. 6.6 Result of Socioeconomic Environmental Zoning
Source: Aqua & Terra Consultores Asociados S.A.S., 2015

6.1.4 Elements with dominant or special sensitivity

According to the environmental baseline, the following elements were identified with a dominant or special sensitivity: Forest Protector-Producer Areas Law 2nd 1959, Areas of the Regional System of Protected Natural Areas - SIRAP (Protective Forest Reserves), streams and bodies of surface water (30 m), corresponding to the areas of environmental importance (Table No. 6.25, Figure No. 6.7, map MOD_LA_PTO_ANT_50_ZA_Especial).

Table No. 6.25 Degree of sensitivity of the elements with dominant or special sensitivity

Elements with dominant or special sensitivity	Degree of sensitivity
Forest Protector-Producer Areas Law 2nd 1959, Areas of the regional system of protected natural areas - SIRAP (Protective Forest Reserves), streams and surface water bodies (30 m) and riverbank forests; corresponding to 52.3 ha.	High

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

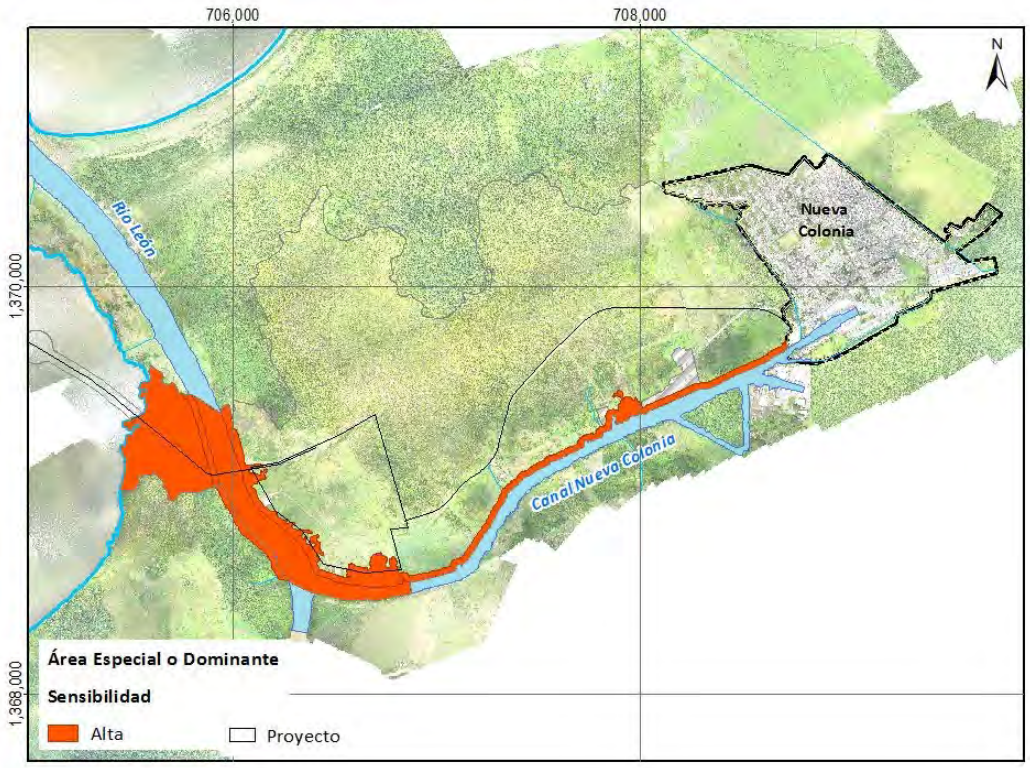


Figure No. 6.7 Areas with elements of dominant or special sensitivity
Source: Aqua & Terra Consultores Asociados S.A.S., 2015

6.2 RESULT OF ENVIRONMENTAL ZONING

With each one of the intermediate maps by component and the elements with dominant or special sensitivity, the zoning map for the area of influence of the project was obtained (Figure No. 6.8 and map MOD_LA_PTO_ANT_51_ZAmbiental).

In Table No. 6.26, the areas and percentages of the environmental sensitivity found in the area of influence of the project are indicated, where 81.8% have a low environmental sensitivity and the other 18.2% correspond to the sensitive areas. very low, moderate and high.

Table No. 6.26 Environmental zoning and the areas that occupy the different degrees of sensitivity

Sensitivity	Area (ha)	%
High	52,3	4,0%
Moderate	110,9	8,4%
Low	1.074,3	81,8%
Very Low	75,8	5,8%
Total	**1.313,3**	**100%**

Source: Aqua & Terra Consultores Asociados S.A.S., 2015

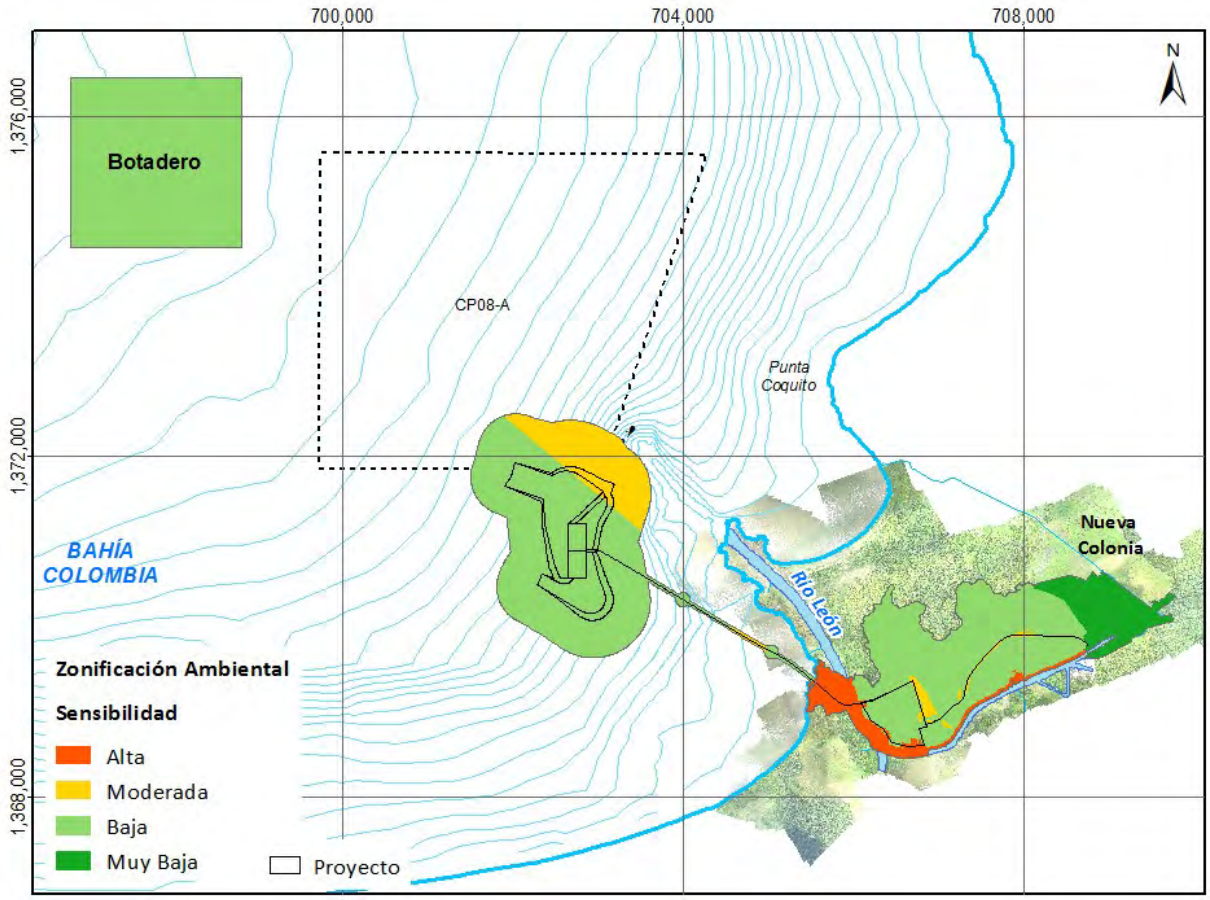


Figure No. 6.8 Environmental zoning
Source: Aqua & Terra Consultores Asociados S.A.S., 2015