

# IMPACTS CAUSED BY SUBSTANCES PRESENT IN ELECTRONIC WASTE IN YOUR CONTACT WITH WATER

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## INTRODUCTION

Water is a vital resource for humanity and for the manufacture of electronic equipment. Be a transverse component of all social, economic and environmental activities. Electronic equipment, is today an icon for the development of an entire society. Both are a necessary condition, limiting or facilitator for any development. But, when water and electronic waste are combined and become a threat to the human environment, it becomes a basis for a conflict (Allsopp, 2006).

## OBJECTIVE

The purpose of this article was to identify the presence of electronics waste in the Brazilian regions with water contamination and present possible scenarios of risk (after the contamination) and their corresponding emergency measures. For this, a case study was carried out in Brazilian regions with information published in some news scenario (with images of the region) and in touch with researchers interested in the subject.

## METHODOLOGY

As a way of presenting this case study on the probable contamination by lead, mercury, cadmium and arsenic in the waters of the rivers considered ideal today in Brazil, and in this case who determines all portability Standards throughout the national territory is Ordinance 2914 of the Ministry of health. This Ordinance recommends that the pH value of water intended for human consumption and supplied by public supply network is in the range between 6.0 to 9. In this way and as a case study, in the North, South, Southeast and Northeast, by virtue of its strong electronics consumption.

## LOCATIONS OF CONTAMINATION

These regions were, the southeastern (Santos-SP), (Vitoria-ES), North (Manaus-AM), (Palmas-PR), the northeast (Recife-PE), (Fortaleza-CE), (Salvador-BA), South (Porto Alegre-RS)

### Northern Region Southeast region



**Figure 1: polluted river on stilts of Manaus.**  
Source: Brazil Agency



**Figure 2: remove the CRT tv rio in Baixada Santista**  
Source: Instituto eco cleaners, 2017

### Southern Region



**Figure 4: the people throw away electronics in the river that supplies.**  
Source: Brazil Agency

### Northeast Region



**Figure 5: Capibaribe River polluted**  
Source: SIREE 2016

## INITIAL RESULTS AND DISCUSSION

During the investigation of our research, the researchers in the North, Northeast, South and Southeast, declared that tests the pH of water would be essential because it could affect the metabolism of several aquatic species and human. So we note that the resolution CONAMA 357 establishes that for the protection of aquatic life and human, the pH should be between 6 and 9.

**Table 1: evaluations carried out in rivers in the Southeast, North, Northeast and South.**

Parsed parameter	COLLECTING DATA				
	COLLECTION POINT	SOUTHEAST REGION 16/01/2015 TO 13/12/2016	NORTHERN REGION 21/02/2015 TO 15/01/2016	NORTHEAST REGION 23/01/2015 TO 12/01/2016	SOUTHERN REGION 16/01/2015 TO 18/01/2016
	TIME	8:00 hours Average of the 12 months	8:00 hours Average of the 12 months	8:00 hours Average of the 12 months	8:00 hours Average of the 12 months
Total cadmium	mg Cd/L	0,002	0,002	0,09	0,001
Total lead	mg Pb/L	0,002	0,002	0,012	0,001
Total mercury	mg Hg/L	< 0,0001	< 0,0001	< 0,0001	< 0,0001
Total Arsenic	mg As/L	<0,001	<0,001	<0,001	<0,001
PH	-	5,4	5,7	5,6	5,4

According to Santos (2016), it demonstrates that the amount of electronic waste produced each year in Brazil is significantly higher than the projections considered in other countries. The Brazil generates a million tons of electronic waste and that in 2013 was in the order of 918,000 tons. The projection for 2020 is in the order of 1.09 million tons. For 2016 and 2017 1 increase around 1.2 million tons.

The variations of the cadmium concentrations (maximum concentration = 0.01 mg/L), lead (maximum concentration = 0.033 mg/L), mercury (maximum concentration = 0.02 mg/L) and arsenic (maximum concentration = 0.033 mg/L) were used from collecting points and their averages along the Rivers surveyed, disclosed in table 01, indicate that the values are below the figures presented and amended by resolution 410/430/2009 and 2011 Resolution of the National Council on the environment ( CNMA) establishing maximum concentrations classified water sweet.

Although there is no evidence of high contamination by heavy metals in this river, the literature demonstrates that there is a risk of metals, even at sublethal concentrations, affect aquatic ecosystems.

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