



ESCUELA SUPERIOR POLITÉCNICA DEL LITORAL
FACULTAD DE CIENCIAS NATURALES Y MATEMÁTICAS
DEPARTAMENTO DE CIENCIAS QUIMICAS Y AMBIENTALES



SECOND EVALUATION OF ENVIRONMENTAL IMPACT OF PROJECTS (70 PTS)

II SEMESTER 2014-2015
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NOMBRE:

PARALELO:.....

NOTA: Este examen está diseñado para ser resuelto de manera individual, puede usar una calculadora ordinaria para sus cálculos aritméticos, un lápiz o esferográfico. Solo puede comunicarse con la persona responsable de la recepción del examen; y, cualquier instrumento de comunicación que hubiera traído, deberá apagarlo y ponerlo en la parte anterior del aula, junto con algún otro material que se encuentre acompañándolo. No consultará libros, notas, ni algún apunte adicional a las que se entreguen en esta evaluación. *Desarrolle los temas de manera ordenada. Firme como constancia de haber leído lo anterior.*

Firma

1. Give the right term for each one of the definition below (2 e/o)

- Simple measurement that indicate potential changes in the original environment of the evaluated site _____
- It is an objective valuation that depends on the selected indicator of the environmental element to be analyzed and used in the calculation of the VIA ____
- Is a representative number or a descriptive classification of environmental data ____
- Is the best scenario of impact mitigation _____
- Is the relative knowledge or ignorance common to every EIA process _____

2. Answer the following questions regarding the Exxon Valdez event (5 pts)

From the different levels of mitigation of impacts, in which one the case of Exxon Valdez can be classified. Explain why?

Mention two mitigation measurements used in the Exxon Valdez case. Explain if they were successful at the time when they were applied and why?

3. Answer the following questions

3.1 What are the three ways mentioned in class that can be applied in order to minimize the impact? (6 pts)

3.2. Which are the four methodologies used for impact prediction. Mention the advantages and disadvantages of each one. (12 pts)

Methodologies used to predict impacts	Advantages	Disadvantages

4. Read the following cases and answer the questions

CASE 1 (11 points)

An EIA has to be developed for the following situation the TOR mention that the methodology to be used in this case must show the impacts and clearly identify direct and non direct impacts. You as the leader of the group should decide according to your knowledge which methodology will be the best in order to fulfill this requirement from the TOR.

DRILLING IN ECUADOR

*The pollution is worse every day. Everyone has a cough or other sickness.
-- Gabriel Alatorre, Petroecuador mechanic in Shushufindi, Ecuador (Althaus, 1996)*

The Ecuadorean Amazon, known as the Oriente, was once one of the richest ecological and sparsely populated sites in the world. When oil was discovered there in 1967, the situation changed dramatically. Extremely high levels of water pollution of drinking, bathing, and fishing waters in the Oriente have been attributed to contamination from unlined waste pits (Brooke, 1994). More than 600 of these toxic waste pits were created during Texaco's involvement in Ecuador between 1972 and 1990 (Kane, 1996). Texaco used such pits set into the ground to store toxic byproducts from oil production and separation. The lack of barriers allowed waste to leak into the surrounding soil. Ecuador's Undersecretary for the Environment, Jorge Alban, reports that Texaco, while having cleaned 268 waste pits, has not cleaned at least 400 pits and these are not included in the cleanup plan signed by Texaco, Petroecuador and the Ecuadorean government (Schemo, 1998).

Oil pollution in local water supplies vastly exceeds international standards. According to the EPA, the level of polycyclic aromatic hydrocarbons (PAHs) deemed acceptable in water is zero, as they are strong carcinogens. The EPA standard in the U.S. is for a maximum PAH concentration of 28 nanograms per liter of water, corresponding to a one in 100,000 lifetime risk of cancer. Samples of drinking water collected near oil production facilities in the Oriente ranged from 33 to 2,793 nanograms of PAHs per liter of water -- counts up to one hundred times the EPA's safety guidelines. Bathing and fishing waters had concentrations ranging from 40 to 1,486 nanograms per liter, and water from waste pits ranged from 46,500 to 405,634 nanograms per liter (Brooke, 1994).

Ecuador's debt has created a dependency upon oil that has pressured the government into two compromising policies: to accept substandard operational practices by oil companies and to open ecologically-sensitive areas to exploration and production, disregarding the effects on indigenous populations. Neither action involved consideration of indigenous groups that have lived in the Oriente for centuries, and rarely were indigenous groups informed of oil production or settlement plans. The Ecuadorean government has estimated the cost of environmental damage to be \$5 billion and has asked Texaco for reparations for cleanup costs in the region (Parrish and Long, 1994).

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Answer the following questions:

- a. Which methodology should be applied in order to fulfill the TOR requirement? (Only one answer is correct) 2 pts

- b. Identify the impacts related to this case and **develop** in a simple way the methodology selected 3 pts

- c. Mention the three types of social impacts and explain for each one of them if you think that kind of social impact might happen in this case 6 pts

CASE 2 (11 pts)

In an area close to Manglaralto there are a group of important aquifers in the area. This zone is well known since the main activity carry by local people is agriculture. In order to protect their crops they use two main pesticides DIEPEST3 and RADE6. Lately, in the last two years they have noticed that quality of the water in the aquifer has decreased. For this reason they asked the local authority to perform the environmental measurements to determine the water quality in the aquifer and decide for what purpose this water can be used.

Calculate the underground quality index according to the parameters given in table of information

- a. Select the right formula

$$\sum \text{Variable}_i + W_i$$

$$\sum \text{Variable}_i + W_1 \cdot W_2$$

$$\sum W_i \text{Variable}_i$$

- b. Define the quality of the underground water according

c.

Variable	Characteristics of the aquifer	Calculation	Value	Quality of the underground water
Conductivity	1.3 x 10 ⁻² cm/s			
Surface soil (<2m)	Arcilla arenosa			
Terrain tilt	15 %			
Depth of the aquifer	15 m			
Recharge	90 mm			
Impact Zone Vadosa	Lutita			
Aquifer environment	Ignea fresca			
Name of Underground water index				

Parameters	Results of the analysis	Fulfill the admissible limits (Y/N)	
		Irrigation	Recreation
Organoclorados (totals)	0.1 mg/l		
Arsénico (total)	0.05 mg/l		
Mercurio (total)	0.045 Hg		
Litio	1.3 mg/l		
Molibdeno	0.01 mg/l		
Admissible use of the water of the aquifer: irrigation or recreation			

CASE 3 (15 pts)

In the city of Guayaquil there is a Citadel called Garzas and there is a car vulcanizer next to it they just opened in this area. The vulcanizer works 24h/7d. The people living in the Citadel ask the local authority to perform an environmental audit, since they complain about the noise. You are the leader of this audit. You have performed a series of noise measurements and questionnaires to the people living in the Citadel during your audit and now you have to present the report to the authority.

Table of noise measurements performed during the audit

Parameter	Noise (dB)	
	06:00-20:00	20:00-06:00
Day 1	43	45
Day 2	44	49
Day 3	41	52
Day 4	41	48
Day 5	40	57

- What is an audit, mention three characteristics of the audit? (3)
- Which are the 2 types of audit discussed in class? Which one are you performing in this case? Explain your answer (3p)
- What will your report say according to the noise levels you found? Give your conclusions according to the results (2pts)
- Mention the primary sources information you used in this audit (2 pts)
- Mention 3 characteristics that an audit report must fulfill (3 pts)
- Indicate the type of zone (landuse) from the table that you have chosen as reference for your audit report (1 pts)
- What is the current name (the new name) of the Ecuadorian Legislation to refer to the allowed limits in noise (1 pts)

Ecuadorian legislation	
Define audit and mention 3 characteristics of it	
Type of audits	
Which audit are you performing	
Conclusions of your audit report according to the noise levels found	
Characteristics of the audit report	
Primary sources used in this audit	
Type of zone (landuse) used as reference	