ENVIRONMENTAL IMPACT STUDY FOR THE RUMICHACA – PASTO DUAL CARRIAGEWAY, PEDREGAL – CATAMBUCO SECTION, UF. 4 AND UF. 5.1, CONCESSION CONTRACT UNDER SCHEME APP NO. 15 OF 2015

Géminis Consultores Ambientales

CHAPTER 11.1.3. Risk Management Plan

San Juan de Pasto, March 2017

TABLE OF CONTENTS

11.1.3. RISK MANAGEMENT PLAN 5
goals ..... **Error! Bookmark not defined.**
General objective 6
Specific objectives 6
Glossary 7
Geographic coverage 8
Punctual area Influence 10
Local area Influence 10
Area Regional Influence 10
Threat Analysis 11
Geological threat: Removal mass 12
High threat 12
Media threat 12
Threat assessment on vulnerable elements 26
Levels of risk acceptability 31
Identification of resources 31
Material resources 31
Institutional resources 33
Human Resources 33
Strategies for emergency care 33
Signaling strategy 34
Strategy for emergency assessment 34
Actions and decisions to deal with the emergency 36
logistical support, equipment and infrastructure 39
11.1.3.1 Risk Knowledge 46
Identification, prioritization and characterization of risk scenarios 46
Analysis and risk assessment 47
Identification and location of the measures to be taken 51
11.1.3.2 Risk Reduction 52
Strategies 52
Event Control Strategy 56
STEPS 77
EVALUATE 77
SIGNS AND SYMPTOMS 77
TO DO 77

EVALUATE 77
AWARENESS 77
CONSCIOUS 77
Answer the call or pressing on the chest over the sternum 77
Ask for help and place in safety position. 77
UNCONSCIOUS 77
unresponsive 77
It does not move 77
Ask for help 77
Clear airway. 77
EVALUATE ROUTE 77
AERIAL 77
BREATHE 77
chest moves or 77
You feel the air out through nose or mouth 77
Help, keep safety position. 77
NO BREATHING 77
chest does not move air feels 77
out through nose or mouth. 77
Administer rescue breathing with the help of safety mask 77
EVALUATE 77
CIRCULATION 77
pulseless 77
chest does not move air feels 77
exiting nose or 77
mouth 77
Administer rescue breathing with the help of safety mask 77
Pulseless 77
You feel the throb in the region of the neck or wrist. 77
Help, keep safe position and monitor the status of 77
consciousness, breathing and pulse until help arrives 77
11.1.3.3 Contingency Management 79
functions 79
procedures 114
Information system 129

INDEX OF TABLES

Table 11.1.3. 1: Seismic Hazard Classification of municipalities through the project, values effective peak horizontal acceleration. 15
Table 11.1.3. 2: volcanology State 20
Table 11.1.3. 3 Snakes recorded by surveys conducted in the area of influence of the road corridor Rumichaca-Pasto. 23
Table 11.1.3. 4: Criteria threat rating 26
Table 11.1.3. 5: Qualification Criteria Vulnerability - Impact on People. Weighted value: 35% 27
Table 11.1.3. 6 Scoring Criteria Vulnerability - Economics and affectation to infrastructure losses. Weighted value: 20% 27
Table 11.1.3. 7 Qualification criteria Vulnerability Environmental Damage. Weighted value: 35% 28
Table 11.1.3. 8 Qualification criteria Vulnerability - loss of image. Weighted value: 10% 28
Table 11.1.3. 9 Identification and location of events threatening the project 28
Table 11.1.3. 10: qualifying result of the threat, vulnerability and risk. 30
Table 11.1.3. 11: Levels of acceptability of risk 31
Table 11.1.3. 12: Classification criteria emergency 36
Table 11.1.3. 13: Decision Making 37
Table 11.1.3. 14:Support entities prevention, care and control emergency 39
Table 11.1.3. fifteen:Features Rescuers and medical care 41
Table 11.1.3. 16:Description of the spill control kit 42
Table 11.1.3. 17:Emergency Kit tank cars 44
Table 11.1.3. 18Kit contingency checkpoints 45
Table 11.1.3. 19: Risk Rating 47
Table 11.1.3. twenty:Frequency and parameters for Training, Outreach and Training .. 54
Table 11.1.3. twenty-one:Methods in firefighting 63
Table 11.1.3. 22:Prevention, management and control for kidnapping and sabotage 75
Table 11.1.3. 2. 3: Staff functions in Stages Emergency Care 113
Table 11.1.3. 24:Criteria for initiating evacuation processes 121
Table 11.1.3. 25:Formats monitoring and periodic evaluation of emergency 124

LIST OF FIGURES

Figure 11.1.3. 1: Threat mass removal of road layout area 13
Figure 11.1.3. 2:Seismic hazard map for Nariño 16
Figure 11.1.3. 3: Process for decision-making in emergency..... 38
Figure 11.1.3. 4: Origin of volcanic ash..... 59
Figure 11.1.3. Action Plan 5 Vehicle Accidents 62
Figure 11.1.3. 6: Action Plan chemicals spill fuel or road accidents 70
Figure 11.1.3. 7 Operating process for the Identification, Evaluation Care and Emergency..... 116
Figure 11.1.3. 8: Procedure for evacuation..... 122

11.1.3. RISK MANAGEMENT PLAN

This plan is designed to generate a clear and strategic tool for planning and managing endogenous and exogenous risks associated with the activities of the Rumichaca - Pasto dual carriageway road project Pedregal - Catambuco section.

Building roads and in general road infrastructure involves risks of a natural, physical and anthropic type requiring the adoption of a risk management policy to minimize the likelihood of occurrence or situations that can cause adverse consequences.

This Risk Management Plan (RMP) intends to meet the terms of reference M-M-INA-02, Version 02, issued by the Ministry of the Environment and Sustainable Development (now MADS) by means of Resolution 0751 of May 26, 2015, whereby contingency plans for road construction projects are required.

Based on the aforesaid, an overview of the risk management plan is presented including the introduction, a brief description of the main project area characteristics, objectives, scope, basic concepts that are addressed throughout the document, the applicable legal framework and the risk management policy supporting this plan.

During the project implementation, work fronts will be established in the road corridor in associated infrastructure. Before addressing the work at each site, Risk Management specifications meeting provisions of this document will be established as well as the characteristics of materials, equipment and supplies used, and climate characteristics and other features observed in the environment.

Risk management is simultaneously applied with each activity, so a schedule in this subject coincides with the actual scheduling and implementation of project activities.

Objectives

General objective

To design and generate tools for prevention, mitigation, control and response to contingencies that may arise during development of the Rumichaca - Pasto dual carriageway road project Pedregal - Catambuco section, identifying risks and exogenous and endogenous threats to which operations are exposed and that could be harmful to human health, the environment, the infrastructure, operations or company image.

Specific objectives

- Determine the potential risks that could be generated by natural actions or anthropic natured interventions, in order to take prevention, mitigation and control actions and in the event of a contingency plan, to activate the mechanisms of the response groups.
- Define strategies for management and control of contingent emergencies that may arise during execution of the work.
- Identify the institutions in the area of influence of project development that may provide support for incidents, accidents, training, among others, in order to include them in the PGR.
- Encourage the participation of personnel who will implement the project as well as the community in prevention activities and emergency response, as part of an ongoing educational process.
- Defining the response team with its respective organization chart and operational procedures.
- Reduce social, economic and environmental losses associated with an emergency situation.
- Minimize impacts that can be generated to:

    - The community and its area of influence
    - The environment and development of the project area
    - Harm the company's image

Glossary

Accident: An incident generating real and obvious consequences.

Affectation (environmental): A temporary change in the environmental characteristics (physical and chemical) in quantities, concentrations or levels incapable of interfering with the welfare or the health of people, wildlife or against or degrading the quality of the environment.

Alert: A declared condition in order to take specific precautions due to the probable and close occurrence of an event.

Threat: Is the likelihood that the occurrence of a contingency is: physical, chemical or biological of exogenous and / or endogenous origin, which can cause impairment on human health, the environment, infrastructure, company image or activities developed.

Near Incident: An incident without real consequences but with potential consequences.

Contamination: Is altering the environment with substances or forms of energy placed there by human or nature activity, in amounts, concentrations or levels capable of interfering with the welfare and health of people, threatening biodiversity, degrading the quality of the environment.

Contingency: It is the likelihood of the occurrence of an event that causes one or more effects requiring immediate action and that could or not leave sequelae.

Leak: Unforeseen discharge of a contained liquid product.

Endogenous: Potential risks posed by improper operation, handling or procedural, depending solely on human activity.

Exogenous: Are natural hazards such as floods, earthquakes and forest fires, among others.

Evacuation: Is the action of moving one or more persons from an area of risk to a lower risk area using safe routes.

Impact: Is the direct or indirect consequence of a threat on vulnerable elements. Where the impact occurs is called the impact area.

Incident: Is a work related event, where some kind of damage occurred or could have occurred to human health, environment, infrastructure, operation and / or company image.

Company facilities: Are all facilities associated with project development: camps (temporary and permanent), concrete, asphalt and crushing plants, work sites, pumping stations, operating businesses administrative offices, mess halls, workshops, rights of way, collection centers, ZODMES, common areas, among others.

Risk Assessment Matrix (RAM): Tool used for qualitative and quantitative risk assessment, facilitating their valuation and classification from the perspective of contingent harm to people, economic, environmental, corporate image and the client.

MEDEVAC: A Medical Evacuation procedure in case of medical emergencies.

PGR: Risk Management Plan

Hazard: Source or situation with the potential of causing harm in terms of injury or illness, property damage, the environment (inside and outside the work area), or the combination of those (OSHAS 18001: 2007)

Risk: Is the combination of the likelihood of an event or dangerous exposure to the severity of the damage or deterioration in the environment, health, infrastructure, company image and / or activities developed in a given period.

SST: Safety and health at work.

Vulnerability: Is the susceptibility of natural, economic and social systems to the impacted by a hazard of natural origin or human-induced. Vulnerability is determined by the source and type of event, the geography of affected area, the technical characteristics of the structures, the condition of ecosystems, readiness to cope with the situation and resilience.

Geographic coverage

The area of influence (PGR) designed for Project takes into account the areas where an endogenous or exogenous incident can occur, its effect and the resources that should be available to prevent and respond.

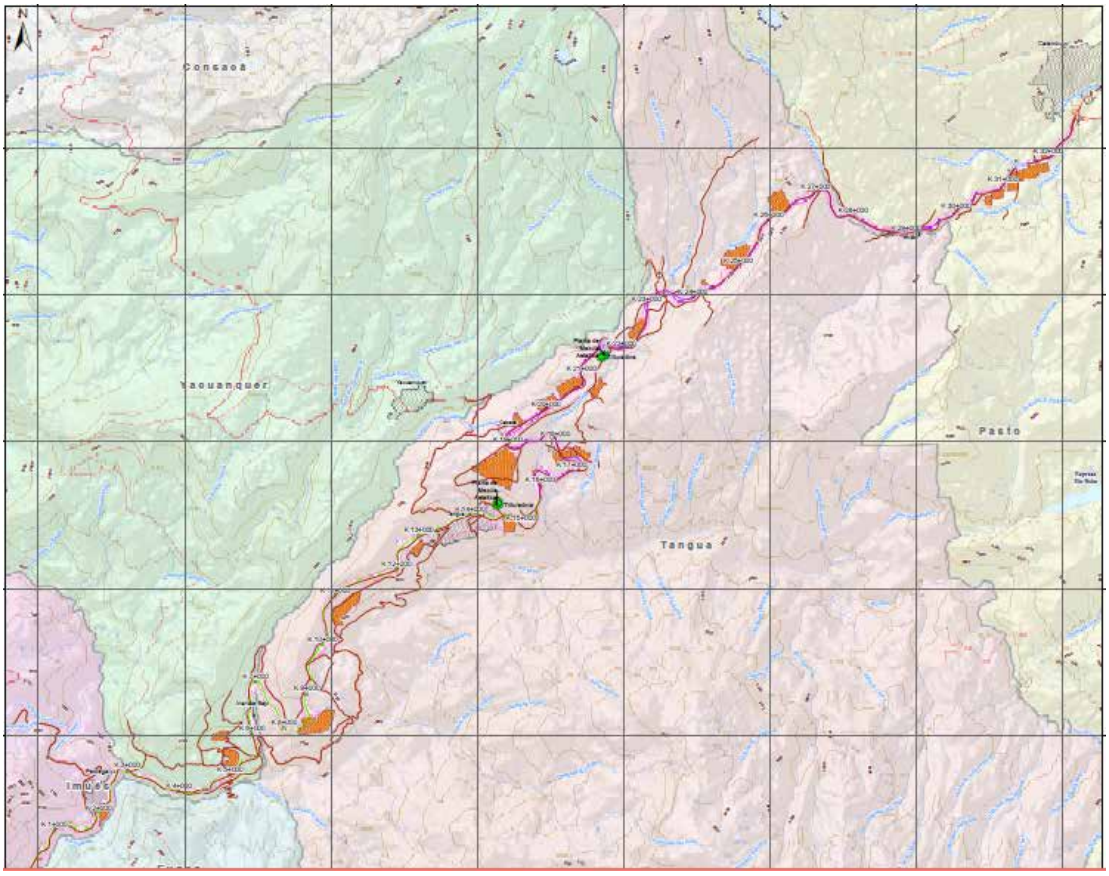


Figure 11.3.1. Areas with the highest risks in the Road Project

For analysis and emergency preparedness, the area of influence of the RMP, is defined in three levels:

- Punctual Influence area
- Local Influence area
- Regional Influence area

Depending on the type of incident and PGR effects, the various prevention, control and mitigation measures will be applied in a timely manner, locally or regionally.

Figure 11.3.1 and annex 11.3.1. show ZODME areas, the road corridor and camps where Risk Management, subject matter of this chapter, will be mainly applied.

Punctual Influence area

Is defined by development of Project activities, contingent incidents presented in the facilities associated with the project and work fronts, is limited to the area of operations, are controlled locally with resources of the operating area and do not involve other areas.

The following is considered for the area of influence of the project:

- Existing road infrastructure and condition those to be used for project development and when responding to an emergency. The figure below shows the roads in project area, the main municipalities that can assist when controlling an emergency whether endogenous or exogenous.

- The infrastructure projected as a development strategy for the project is: permanent and temporary camps, work sites, associated facilities, collection points and wastewater discharge, industrial roads, among others.

The area of punctual influence includes the stages and core activities of the project as described in Chapter 3 Project Description and Chapter 8 Environmental Evaluation of this study, summarized below:

Local Influence area

It is the area defined by the distance of impact of the various incidents that could occur near the facilities (fires, spills, leaks, etc.) and not affecting large areas.

The local influence area includes the punctual influence area and the area that could be affected or involved outside the perimeter of project associated facilities or infrastructure. It is delimited by the counties that are part of the project, where the contingent emergency would be handled; included is the existing road network inside and outside the project used for mobilizing (authorized access roads, roads for mobilization in emergencies are included).

Regional Influence Area

It comprises the local influence area plus the punctual influence areas already described. For purposes of this PGR, the total Pedregal – Catambuco dual carriageway road project Rumichaca Pasto Section area is considered, in addition to the existing water basins inside the area of influence where the control points are located. The

following map shows the regional influence area, which is bounded by the basins that are influenced by the project.

Threat Analysis

This analysis is to identify natural and anthropogenic threats that could occur in development of the project and that could eventually produce physical, economic and environmental harm. For such end, detailed below are localized threats in the project area.

For the development of this analysis the maps transposition methodology was used, whose objective is to identify on a map the spatial location of the road and the risk areas map resulting from field visits and consultation of secondary information.

It is important to note that for each aspect as set forth below, information such as type and land use, basins, aqueducts, drainage works, groundwater, slope stability, geological faults, type of current infrastructure, floods, landslides, earthquakes, volcanic eruptions was taken into account.

The sources of information were integrally analyzed with participation of each study area involved in the analysis of threats:

Endogenous threats

· Climate threat: keraunic level.

This is related to atmospheric events such as lightning and thunder. The keraunic threat is defined as the number of days in the year in which one or more thunder is heard in the study area, this is called the keraunic level.

In Colombia, keraunic threat is considered high-level if more than 70 events a year occur. Using the keraunic map, the Nariño department presents regions with low keraunic levels.

· Water threat: Floods

Flood hazard on the Pedregal - Catambuco road section is very low, mainly because the road is located on a hilly terrain with slopes ranging from moderate to very steep, with a predominance of currents called mountain streams with little or no floodplain development.

Geological threat: Landmass movements

Regionally, according to the National Map on Relative Threat of landmass movements, the project area is located on two areas classified as of high and medium threat in a threat categorization of mass movements in Colombian territory, (Plate 5-18, Ingeominas, 2010) as described below:

High threat

This corresponds to areas with unstable slopes and areas with marked instability slopes due to erosive processes, with strong anthropic intervention where landmass movements are less frequent and numerous; although the processes can cause partial destruction of homes, infrastructure lines as aqueducts, pipelines, gas pipelines, networking power systems, roads, unpaved roads, main roads, drainage systems, channels and acreages. There may be significant morphological changes and riverbeds may become clogged causing damming and avalanches. Environmental policies and actions to preserve the environment and reduce negative impacts on the economy of society are recommended.

Medium threat

These are areas with no evidence of current slope instability and areas with low instability slopes caused by low instability erosion processes, with predominating creeping processes. It is recommended to avoid deforestation and to establish best practices for use and soil management, such as preservation of native vegetation cover, especially on slopes of sewers and streams and generally in steeper areas (see Figure 11.1.3.1).

Most of the road layout is regionally framed within a high threat of landmass removal and medium to high towards the end of the project. This is due to consolidation of the materials making up the lithological units of his area, which may be susceptible to some process by blasting agents such as rain or earthquakes.

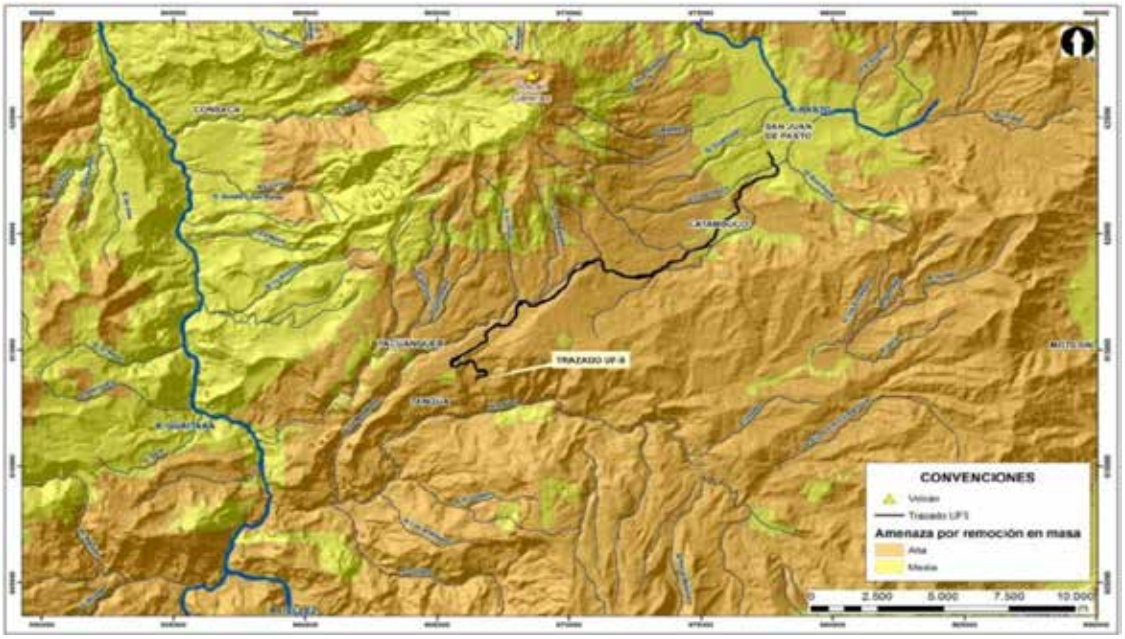


Figure 11.1.3. 1: Threat landmass removal of road layout area
Source: Map landslide threat, scale 1: 500000 SGC

Geotechnical threat: Seismic. The seismic risk is defined as the likelihood that a parameter such as acceleration, velocity or terrain displacement produced by an earthquake exceeds or equals a reference level.

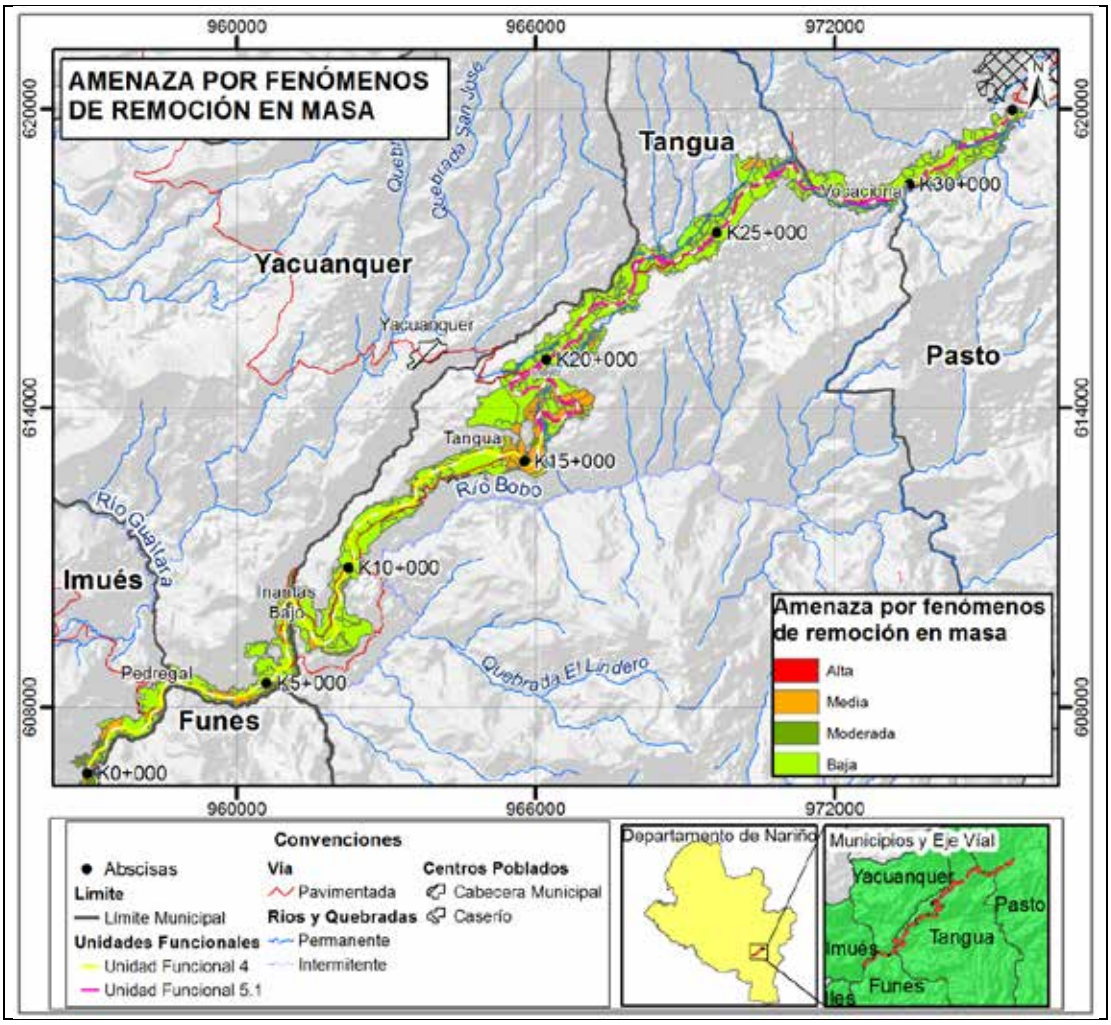


Figure 11.1.3.1 Threat of landslides phenomena

Source Gemini Environmental Consultants, 2016

The evaluation of seismic hazard conditions of the defined area of influence was based on the Seismic Zoning Map of Colombia prepared by the National Geological Survey. The effective acceleration peak (Aa) corresponds to horizontal accelerations of the earthquake of design referred to in the Colombian Design and Seismic-Resistant Construction standards (NSR-10), as a percentage of the acceleration of earth gravity (g = 980 cm / s) . These accelerations have a probability of being exceeded by 10% within 50 years, corresponding to the useful life of a building. Aa is used to define the seismic

designs loads required by the Seismic-Resistant Building Regulations. See Table 11.1.3.1.

Table 11.1.3. 1: Seismic Hazard Classification of municipalities crossed by the project, values of effective peak horizontal acceleration

Municipality	Seismic hazard zone	Coefficient effective peak horizontal acceleration (Aa)
Imués	High	0.20
Tangua	High	0.20
Yacuanquer	High	0.20
Pasto	High	0.20

Source: (NSR-10)

These values must be taken into account in accordance with numeral H.5.2.5 of the NSR-10, the seismic design coefficient values for pseudo-static analysis of KST slopes is less than or equal to amax value, depending on the type of ground materials (reinforced or not) and the type of analysis. The amax value for soils, rockfill and very fractured rock mass is 0.8. See Figure 11.1.3.2.

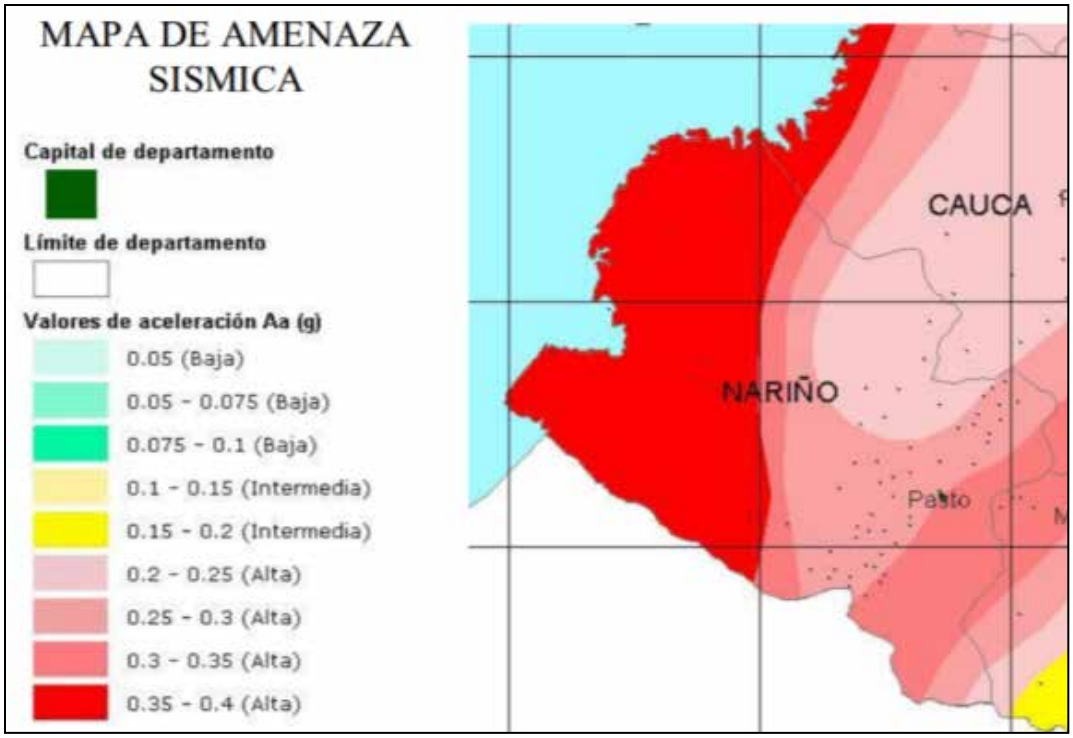


Figure 11.1.3. 2: Seismic hazard map for Nariño
Source (INGEOMINAS, 1997)

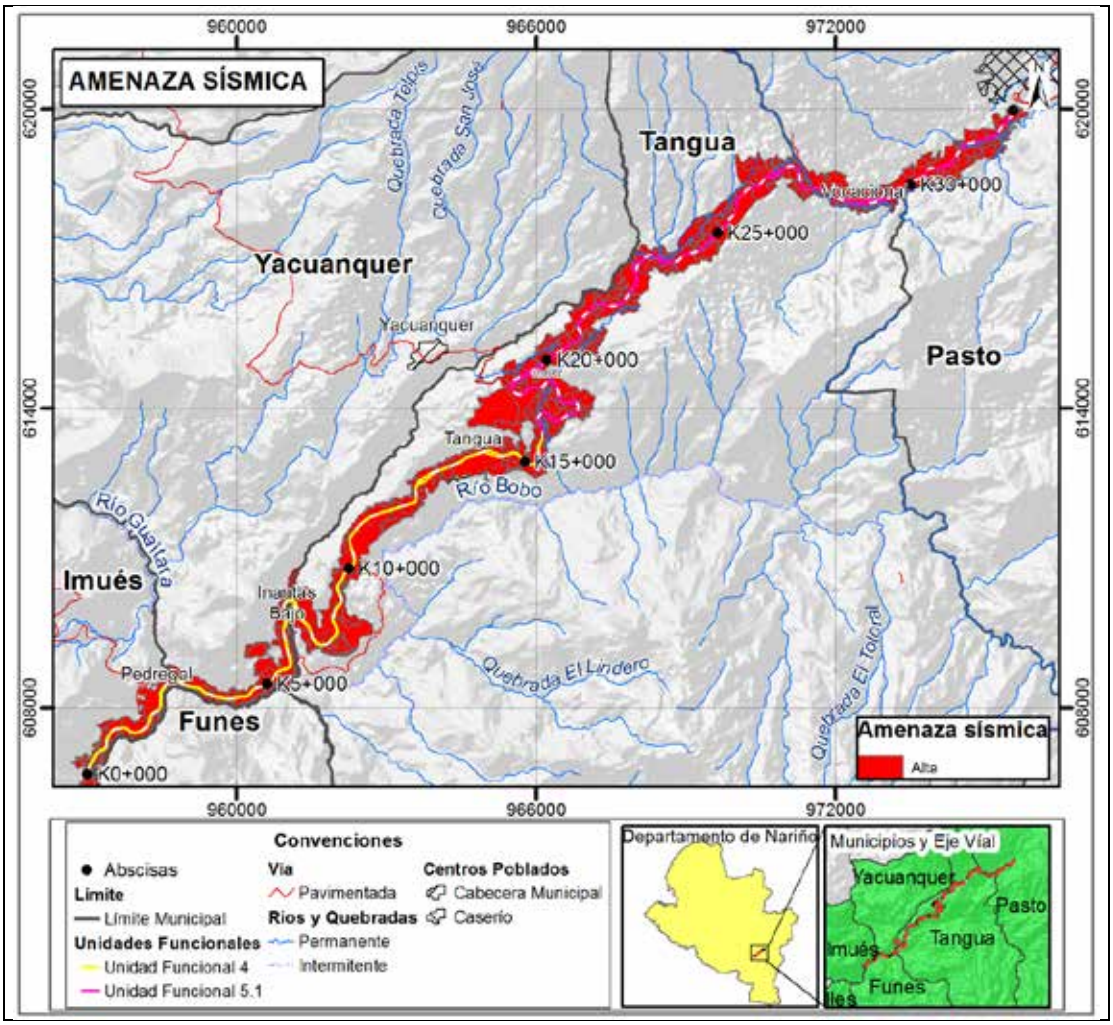


Figure 11.1.3.2 Seismic Hazards

Source Gemini Environmental Consultants, 2016

· Geological threat: Volcanic Risk

This volcanic risk refers to the likelihood of the occurrence of volcanic events and the vulnerability of the elements exposed to such hazards. Therefore, the road layout can be affected directly by the products of an eruption (lava flows, fall and / or pyroclastic flow, etc.) and / or indirectly by phenomena such as landslides mainly.

Volcanoes modify the relief, during an eruption large amounts of materials are spewed that can alter the landscape. There are also various types of events, such as earthquakes, volcanic gases, pyroclastic fall, pyroclastic flow, lava flows, among others, that could cause damage to the population and surrounding infrastructure. These are classified as major threat or detonating events that from volcanoes can generate other events such as landslides and torrential floods.

An important volcanism has affected the Central Cordillera and eastern flank of the Western Cordillera south of Manizales. Volcanoes whose location is controlled by fault systems play a key role in the morphology of the southern part of the Colombian Andes. Among the main volcanic units of the area is the Galeras volcano, which is located in the area of indirect influence of the project.

Nariño is located in the so-called Nudo de Los Pastos where traditionally it is said that the three large Colombian mountain ranges meet: Western, Central and Eastern; the major fault systems converge here, towards the north, and geologically serve to define the boundaries between these ranges.

Volcanism in this sector is related to a phenomenon of subduction since this sector is located in the margins of an active plate convergence, resulting in six volcanoes 5 of which are considered active but at rest and one active in eruptive state of which one has no historical eruptive record in the department of Nariño.

During the past 80 years, volcanic activity in this sector has not reached dangerous levels but this does not mean that the danger has diminished or disappeared, leading to the need to know the volcanic risk posed by the road layout of the project. Volcanoes that could affect the road layout according to their proximity are Cumbal, Azufral Galeras and Doña Juana, which are described below.

- Cumbal volcano

The Cumbal volcanic complex is located in the department of Nariño, west of the town of Cumbal, 57 km southwest of the start of the UF 5section and 79 km southwest of the city of Pasto.

It is located on a cretaceous base consisting of volcanic rocks of oceanic and marine sedimentary affinity. Its newest products are superimposed lava flows, blocks and massive scoriaceous, pyroclastic flows (ash and slag, ash and pumice, ash) and debris and pyroclastic flows covering the entire area. Such products can be classified as andesite of two pyroxene, porphyritic with hypocrystalline matrix composed of

plagioclase (andesina-labradorite), pyroxene and ortho clino and glass; olivine appears as accessories and water shows an increase in SiO2, allowing classifying it as dacite.

It consists of two active stratovolcanos known as Mundo Nuevo and La Plazuela, and at least three small adventitious craters. The complex is active bur currently at rest, presenting activity represented by gaseous emissions from its volcanic vent, the presence of thermal sources and low occurrence and magnitude seismic activity.

Historically there have been two eruptions (December 1877 and December 20 and 21, 1926) however, these are no records or any clear or obvious evidence that they occurred.

- Azufral Volcano

The Azufral Volcano, formerly known as Chaitan, is located 12 km east of the town of Túquerres, south of the volcanic chain in the southeast sector of the Department of Nariño and 34 km (straight line) from the start of the road layout. It has a height of 4070 masl.

It corresponds to a stratovolcano - caldera where the crater lake called Laguna Verde is located; there is no presence of glaciers and has registered deposits associated with lava flows, great magnitude pyroclastic flows and fall deposits (ash and pumice). There is currently fumarole activity and some seismic events.

- Galeras Volcano

The Galeras volcano is located in the area of indirect influence of the road layout, approximately 15 km from the town of Tangua and 9 km west of the City of San Juan de Pasto.

It is the most recent and currently active center of the Galeras Volcanic Complex (CVG), having a conical shape with the western part of its building destroyed.

With an estimated 4500 years (before present age), it is the most recent and youngest eruptive center of a series of volcanoes that make up the so-called Galeras Volcanic Complex (CVG); with a total evolution of just over a million years, identifying 7 important eruptive conditions recognized from the oldest to the most recent as: Cariaco, Pamba, Cobanegra, La Guaca, Genoy, Urcunina and Galeras.

The Galeras Volcano belongs to the stratovolcanoes type, dominantly andesitic with has a conical shape and is housed within an earlier structure (amphitheater) destroyed to

the west. Presents characteristic vulcanian type eruptions with eruptive columns can reach between 6 and 12 Km. The Galeras is considered one of the most active volcanoes because it has high rates of periods of activity compared to time periods when it remains at rest.

- Doña Juana volcano

The Doña Juana Volcano is located in northeast of the Department of Nariño and is considered as one of the most active and dangerous volcanoes in Colombia. Historically, several explosive eruptions were recorded in the period 1897-1936.

The Doña Juana volcano is considered an andesitic stratovolcano, with a close to 4 Km diameter crater without glaciers, recorded deposits associated with lava flows, pyroclastic flows and ash; the volcanic activity risks are pyroclastic flows, sludge or lahars and ash falls.

Current Volcanic Activity

Currently volcanoes that are close to the road layout have presented levels of volcanic activity recorded by volcano observatories attached to the Colombian Geological Survey; these levels of activity are presented in Table 11.1.3.2

Table 11.1.3.2: Volcanology status

Volcano	level	Number	Activity status	Possible scenario
Galeras		III	Changes in volcanic activity behavior	Variations in monitored parameter levels indicate that the volcano is above the threshold base and that the process is unstable and may evolve by increasing or decreasing these levels. Phenomena like swarms of earthquakes, some of them felt are registered; ash emissions; lahars; morphological changes; noise; volcanic gas odors among others, which may alter the quality of life of the populations in the area of volcanic influence.
Azufral		IV	Active volcano and stable behavior.	The volcano may be in a ground state that characterizes the period of rest or quiescence, or record seismic or fumarolic activities or other manifestations of surface activity mainly affecting the immediate or close to the center of the emission area, so there is no risk for the populations and economic activities in its area

Volcano	level	Number	Activity status	Possible scenario
				of influence.
Cumbal		III	Changes in volcanic activity behavior	Variations in monitoring parameter levels indicate that the volcano is above the threshold base and that the process is unstable and may evolve by increasing or decreasing these levels. Phenomena like swarms of earthquakes, some of them felt are registered; ash emissions; lahars; morphological changes; noise; volcanic gas odors among others, which may alter the quality of life of the populations in the area of volcanic influence.
Doña Juana		IV	Active volcano and stable behavior	The volcano may be in a ground state that characterizes the period of rest or quiescence, or record seismic or fumarolic activities or other manifestations of surface activity mainly affecting the immediate or close to the center of the emission area, so there is no risk for the populations and economic activities in its area

Source: (Http://www2.sgc.gov.co/Pasto)

Follow the Figure Volcanology Threat in the area of influence.

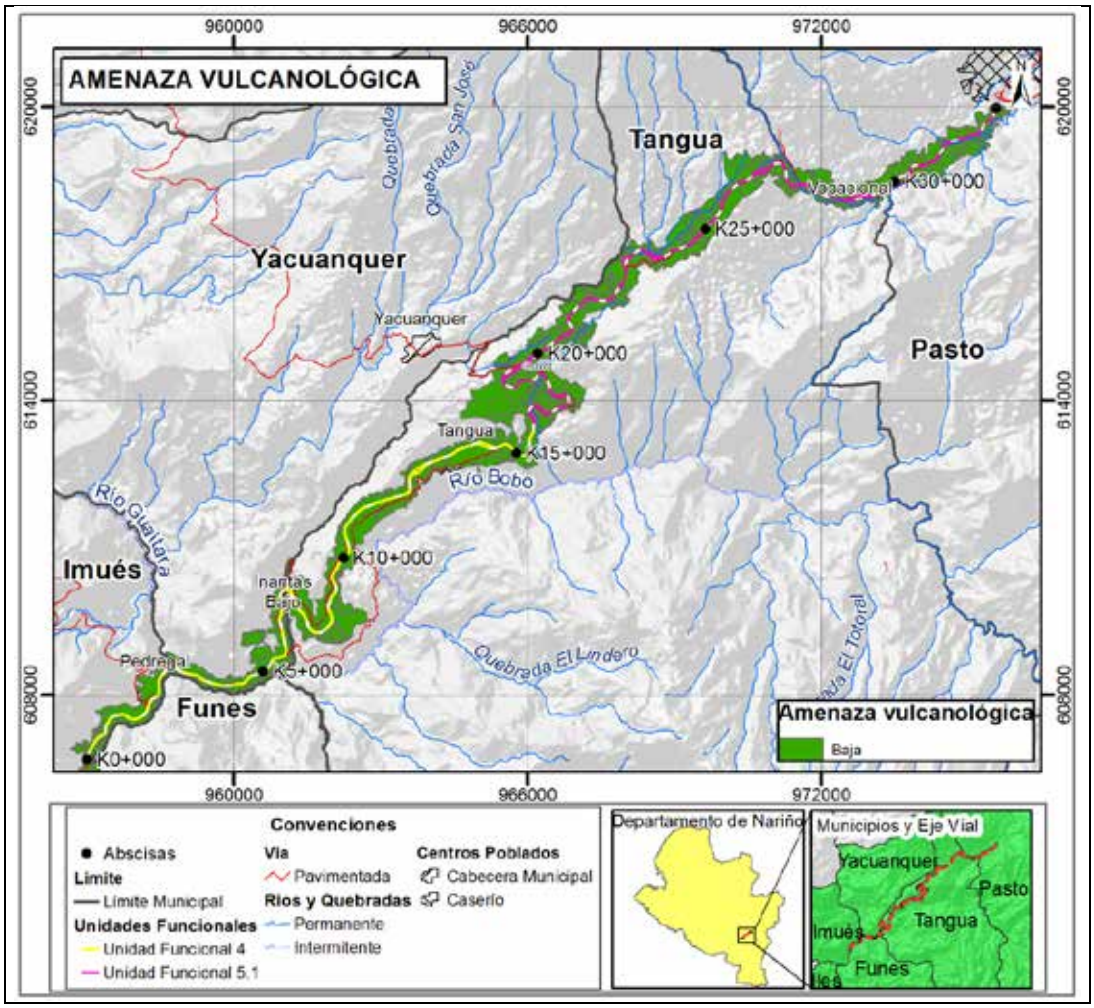


Figure 11.1.3.3 Volcanology Threat

Source Gemini Environmental Consultants, 2016

· Forest threat: Forest Fires

Susceptibility of forest vegetation fires in the AI of the Project was determined based on the potential fireproof cover addressing the vegetation's pyrogenic properties (combustibility or flammability) of the vegetation cover.

Fires are the effect of oxidation reactions of combustible material reacting with air and heat. Usually, when a spill of flammable substances, explosions, gas accumulation indoors among other occurs, the necessary steps to manage the fire must be taken

depending on the substances in each operational area and camps since many of these are highly volatile.

The effects of fire incidents are: radiant heat damaging structures and the environment close to the area of the fire outbreak, also producing suffocating and toxic fumes (the degree of toxicity depends on the combustible material); overpressure explosions or harm to health and the environment can result from pressurized systems or fuel deposits.

· Biological Threats (Presence of animals)

The biological threat can come from bites or stings from poisonous and / or venomous animals. Based on information gathered from wildlife surveys applied to the inhabitants of the area of influence of the project, the presence of snakes referenced in Table 11.1.3. 3 was ascertained.

Table 11.1.3.3 Snakes recorded by surveys conducted in the area of influence of the Rumichaca-Pasto road corridor.

ORDER	Suborder	FAMILY	SPECIES	VERNACULAR TOPONYMY	ALTITUDE (m)
Squamata	Snakes	Xenodontinae	*Atractus orcesi*	Land	200 - 1200
Squamata	Snakes	Xenodontinae	*Peruvian Dipsas*	Snail eating snake	500 - 3000
Squamata	Snakes	Xenodontinae	*Erythrolamprus epinephelus*	Green loggerhead snake	0-2926
Squamata	Snakes	Elapidae	*Micrurus dumerili*	Coral	0-2133

Source (Gemini SAS Consultants, 2016)

- Snakes identified by surveys are the genus species Micrurus (*Micrurus dumerili*) representing the highest threat potential in the area, since all species of the genus Micrurus are poisonous and many are potentially deadly to humans. The species of this genus have neurotoxic poisons considered more dangerous than most of the proteolytic poisons of snakes.

Given the presence of these species in the area of influence of the road corridor, and since several core activities of the preconstruction and construction phases will take place in areas that can potentially be part of the habitat of these snakes (coral snakes in

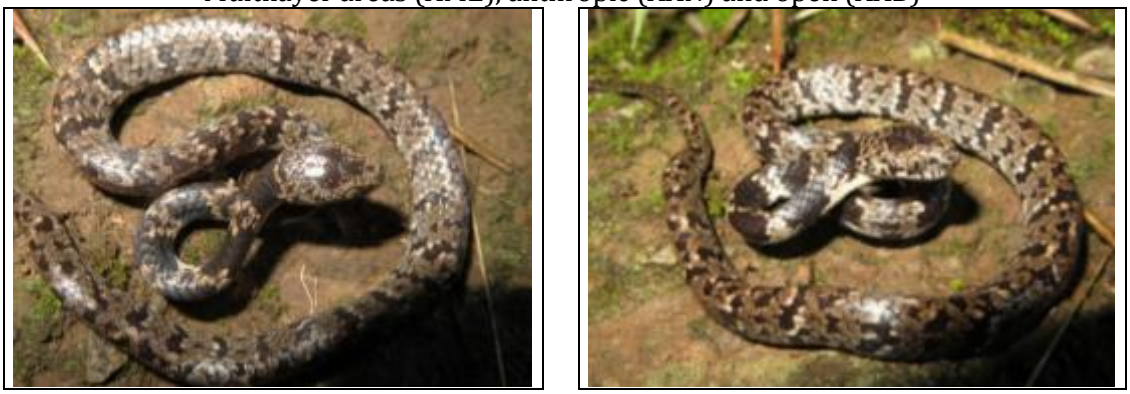
particular are characterized by using of all kinds of plant cover), it is considered a biological threat in the area, so contracted personnel will be trained in the respective preventive measures and appropriate response in the event of an accident.

Although only the presence of the species Micrurus dumerili is reported the risk of other recorded species cannot be ruled out; although not poisonous, a potential bite can be very painful leading to complications that alter the normal work of professionals.

Another latent risk in the area is the accident by hymenoptera (bees and wasps), which affects the entire rural area to intervene; this produces bite injuries in head, neck and limbs. The difference in how venom is injected between bees and wasps is that the stinger of the first is serrated, so is embedded, while the wasp sting is smooth so it is easily remove. Bites can cause inflammation, anaphylactic problems, induce allergic reactions. The reaction may be varied and will depend on the victim. This risk is considered a biological threat in the area, so contracted personnel will be in the respective preventive measures and appropriate response in the event of an accident.

Other records product of field trips regarding snakes are presented in Photograph 11.1.3.1:

Multilayer areas (AME), anthropic (AAN) and open (AAB)



Photography 11.1.3. 1 Sibon nebulata – loggerhead snakea
N: 1.059718 **W:** -77.42464
Multilayer (AME) and anthropic (AAN) areas
Source: Gemini Consulting SAS

Exogenous threats

· Presence of armed groups outside the law

The project is located in the department of Nariño in the southwestern region bordering Colombia and the country of Ecuador. This border situation and the fact that the department has access to the Pacific Ocean makes it a strategic area facilitating routes to armed and illegal groups that use them for illegal activities and that are difficult to control by the authorities. The aforesaid becomes difficult to control furthering problems of arms and drugs trafficking for the department.

So for example, the border area has sometimes been used as a rearguard area by the FARC; there is displacement of Colombians to this country with evidence of Ecuadorian civilians affected by actions of armed groups. Most regions of the Nariño department have presence of both guerrilla groups and paramilitaries, being a department affected by the armed conflict, which has substantially affected the civilian population.

As for the presence of illegal armed structures, both the FARC and the ELN are present in the department since the eighties, the first through fronts 8, 29 and 63, of the Daniel Aldana, Jacinto Matallana and Mariscal Sucre columns and the second through the Mártires de Barbacoas, Héroes de Sindagua columns and company Camilo Cienfuegos. On the other hand, after the demobilization of the Bloque Libertadores del Sur, of the Central Bolivar Bloc (BCB) of the AUC on July 30, 2005, criminal gangs linked to drug trafficking appeared. In this regard, according to information from the National Police, the criminal Organización Nueva Generación acts in the department and according to the Early Warning System of the Ombudsman, the Autodefensas Campesinas Nueva Generación, Mano Negra y Las Águilas Negras are also present. Finally, with regard to organized crime, drug traffickers from the Valle and Antioquia have moved to the department of Nariño, especially the gang Los Rastrojos, whose leader is Wilber Varela, alias Jabón and armed structures answering to Diego Montoya, both from the Norte del Valle cartel. (Http://www.acnur.org/t3/uploads/media/COI_2181.pdf?view=1)

· Land transportation risk

Land transportation refers to any mobilization activity of personnel, machinery, supplies, emergency equipment among others, using the existing road network in the area of project development. The following risks from land transport were identified:

- Collisions with other vehicles on the road (simple and complex).
- Rollovers that can produce supply and fuel spills, among others.
- Collisions with other objects such as ravines, posts, traffic signs.

Threat evaluation of vulnerable elements

System characterization was made using the Risk Analysis Methodology by Colors in a qualitative and quantitative manner, considering the processes and activities to be developed for project construction. Having characterized the system, the method was divided into two main components, the estimate of the threat and the vulnerability. This methodology was used to analyze the vulnerability of people, resources, systems and processes; the synergy analysis of previously exposed determined the level of risk identified by color allowing us to classify and evaluate them.

The following methodological process must be considered when evaluating the different risk factors:

- Valuation of the environmental sensitivity of the physical environment in relation to the changes generated by project implementation.
- Identification of the areas of greatest sensitivity of the environment and and vulnerability of the physical works.
- Evaluation of different risk factors.

The methodology proposed by Arboleda and Zuluaga that defines risk as was used for the risk assessment:

R = A × V = P × I, where
R = qualitative value of risk.
P = likelihood of occurrence of a threat = A.
I = intensity or severity of potential consequences = V.

The threat is classified considering the criteria defined in Table 11.1.3.4. that is based on the likelihood of occurrence of the event.

Table 11.1.3.4: Criteria threat qualification

LEVEL	CRITERION	QUALIFICATION
Unlikely	More than five (5) years for an occurrence	1
Remote	Up to (1) event every 5 years	2
Occasional	Up to (1) event every year	3
Moderate	Up to (1) event per month	4
Frequent	More than one event per month	5

Source: Taken and adapted (Arboleda, January - April 2005)

Identifying causes allowed defining events that could occur and the physical places where they can develop. Once these two parameters were established, threat qualification criteria were defined the analysis was conducted seeking to estimate the occurrence of threatening events.

Second, the threat was determined by identifying criteria and rating parameters, which in this particular case were:

- Impact on people
- Impact on existing infrastructure
- Environmental damage
- Image Loss

Once the criteria and scale values were defined and a vulnerability qualification was made, determining the potential damage of each event in defined criteria. This was determined with a percentage value as follows:

- 35% impact to people
- 20% for economic losses
- 35% damages to the environment
- 10% for damages caused by loss of image.

To evaluate the vulnerability the consequences caused on the following were considered:

- People corresponding to 35%, see Table 11.1.3.5
- Impact to infrastructure and economic losses 20%, see Table 11.1.3.6
- Environmental damage corresponding to 35%, see Table 11.1.3.7
- Loss and maintenance of image corresponding to 10%, see Table 11.1.3.8

Table 11.1.3.5: Vulnerability Criteria Qualification - Impact on People. Weighted value: 35%

LEVEL	CRITERION	QUALIFICATION
Insignificant	No injuries	1
Marginal	Temporary injury (no disability)	2
Critical	Injury with permanent disability	3
Disastrous	Injury with death of a person	4
Catastrophic	Injury with death of more than one person	5

Source: Taken and adapted (Arboleda, January - April 2005)

Table 11.1.3.6 Vulnerability Criteria Qualification - Economic Impact on infrastructure and losses. Weighted value: 20%

LEVEL	CRITERION	QUALIFICATION
Insignificant	Up to $ 1,000,000	1
Marginal	From $ 1,000,001 to $ 10,000,000	2
Critical	From $ 10,000,001 to $ 50,000,000	3
Disastrous	From $ 50,000,001 to $ 100,000,000	4
Catastrophic	More than $ 100,000,000	5

Source: Taken and adapted (Arboleda, January - April 2005)

Table 11.1.3.7 Vulnerability Criteria Qualification Environmental Damage. Weighted value: 35%

LEVEL	CRITERION	QUALIFICATION
Unlikely	Without affecting the environment	1
Remote	Localized impacts, remediable	2
Occasional	Scattered impacts with limited remediation	3
Moderate	Scattered impacts are not remediable	4
Frequent	Permanent damage	5

Source: Taken and adapted (Arboleda, January - April 2005)

Table 11.1.3.8 Vulnerability Criteria Qualification - Loss of image. Weighted value: 10%

LEVEL	CRITERION	QUALIFICATION
Unlikely	Unaffected by exception of liability	1
Remote	Impact from liability of contractors and / or external consultants	2
Occasional	Low operator responsibility	3
Moderate	Medium - high operator responsibility	4
Frequent	Total operator responsibility	5

Source: Taken and adapted (Arboleda, January - April 2005)

Once the criteria results were obtained the events were qualified with a weighted value, using above qualifications for such purpose.

Table 11.1.3.9 Identification and location of events threatening the project

EVENT	DESCRIPTION OF THE EVENT	LIKEY GEOGRAPHICAL LOCATION EVENT
NATURAL		
Earthquakes	The threat level for earthquakes is high with the presence and involvement of geological faults, the effects are directly proportional to the magnitude of the event.	Project area

EVENT	DESCRIPTION OF THE EVENT	LIKEY GEOGRAPHICAL LOCATION EVENT
Floods	This phenomenon is low frequency of occurrence due to the topography of the area.	Temporary installations and work fronts
Landslides	Can occur in periods of heavy rain, movement of heavy machinery or deficient excavations and fillings slope operations, so this event is considered with a likelihood occurrence, given the geology and geomorphology of the area where the project will be developed	Work fronts on surface road.
Volcanic eruption	The outpouring of lava and ash can come from three volcanoes that are close to the area of influence in the event of eruption and given topographies conditions this event may affect the project	Project area
Electric storms	Electrical storms may occur given atmospheric conditions	Project area
Presence of animals	Is conditioned by the presence of animals generating some kind of threat to humans, some of them are zoonotic vectors.	Project area
ANTHROPIC		
Public order situations	Events consequence of socioeconomic aspects or outside the control of the project or transversal that lie in generating expectations associated with project benefits or job creation	Project area
Actions of armed groups outside the law	The internal problems of the country entails that it is likely that events that threaten the integrity of the infrastructure by groups outside the law may occur	Project area
Work accidents	Materials handling, heavy machinery and disrespect for rules and measures of the safety manual at work	Camps, zodmes, work fronts
TECHNICAL		
Forest fires	Climate changes and geographical variations are affected by the phenomena of El NIño and La NIña making weather conditions change drastically where drought periods, the influence of air currents and topsoil as fuel may lead to three types of fires: ABC	Work sites, temporary facilities, industrial facilities.
Damage to	Development of project activities leads to the	Work sites

EVENT	DESCRIPTION OF THE EVENT	LIKEY GEOGRAPHICAL LOCATION EVENT
utilities	possibility of affecting artworks, networks, existing accesses.	
Chemical spill	Transporting the mixtures for asphalt layer forming can cause spills from equipment failure or accidents and vehicles in the same corridor.	Project Areas
Traffic accidents	Changing traffic management, vehicle speed management, detours and excavations conditions favorable for the occurrence of accidents, although unlikely to happen given the expected signage may cause deaths and damage to vehicles and cargoes	Project area
Handling explosives	An explosive is inherently dangerous and with regulated use. Ground vibrations, noise and air produced by blasting are potential causes of damage.	Work sites that require it

Source: Gemini Consultants SAS, 2016

The risk rating was obtained according to the aforesaid, see Table 11.1.3.10

Table 11.1.3.10: Results of qualifying the threat, the vulnerability and the risk.

EVENTO	AMENAZA	VULNERABILIDAD					
		AFECTACIÓN PERSONAS 35%	PERDIDAS ECONÓMICAS 20%	DAÑOS AMBIENTALES 35%	PERDIDA DE IMAGEN 10%	ÍNDICE DE VULNERABILIDAD	CALIFICACIÓN DEL RIESGO =AxV
Movimiento telúrico	3	4	5	3	1	4	12
Inundaciones	1	1	2	2	1	2	2
Remoción en masa	4	4	3	2	4	3	12
Actividad Volcanica	4	4	5	3	1	4	16
Presencia de animales	5	2	1	1	1	1	5
Situaciones de ordén público	4	2	2	2	1	2	8
Acciones terroristas	3	2	4	3	1	3	9
Accidentes de trabajo	3	3	2	1	4	2	6
Incendios forestales	3	2	3	4	2	3	9
Daños a redes de servicios públicos	3	1	4	3	5	3	9
Derrames de sustancias químicas	3	1	4	3	5	3	9
Accidentes de transito	5	5	3	1	3	3	15
Manejo de explosivos	1	4	5	5	5	5	5

Source: Gemini Consultants SAS, 2016

Note: See Annex 11.1.3.1 for the formulas used where the percentage rating of vulnerability and risk rating was obtained.

The result of this evaluation identified threat-posing activities, such as landmass removal, volcanic activity and public order situations. As for the vulnerability, the most significant were management of explosives, volcanic activity and earthquakes.

Levels of risk acceptability

Based on assessment criteria and considering threat and vulnerability risks, risks were classified as follows, see Table 11.1.3.11.

Table 11.1.3.11Levels of risk acceptability

INDICATOR	DESCRIPTION
Acceptable (1-5)	Events do not represent a significant risk and their consequences are minor.
Tolerable (6 to 10)	Events that can potentially cause significant damage requiring designing development plans and activities that reduce the risk.
Unacceptable (11-25)	Events that can cause serious injury and require priority attention plans, protection and prevention measures because of the high impact they would have on the environment. A high availability of resources and intensive monitoring strategy is required.

Source: Taken and modified (Arboleda, January - April 2005)

Identification of resources

Management of events occurring during project development requires having physical, human, institutional and material resources to cope with any emergency.

Material resources

According to prevention and care measures, the needs of the brigades and committees are specified.

- Muster Points

A vertical signal indicating the muster point where workers must meet in emergency and evacuation is placed in front of each outdoors main work area.,

This site must have been previously selected ensuring its goal of being a safe place is met.

- Fire

There will be fire extinguishers strategically distributed in all work fronts, camps, offices and vehicles and machinery.

- Incidents and accidents

There is an internal telephone communication system of by shouting with the emergency brigade, heads of sections, supervisors and SST personnel. Items for attention are

· Smoke masks
· Gloves
· Mono-goggles
· Stretchers
· Immobilizers, orthopedic collars
· First aid kit

- Vertical rescue

· Harness
· Vertical lifelines
· Horizontal lifelines
· Specialized vertical rescue items

- First Aid Kit

All work fronts will have First Aid kits with contents stipulated by law.

The emergency brigade will have access to personal protective equipment such as:

· Safety helmet with chinstrap.
· Dust / fume mask
· Gloves
· Reflective vest.
· Safety boots.
· Safety glasses.
· Working at heights equipment (lifelines, harnesses, fall arresters, karabiners).

- Rescue team

· Certified static rope rescue.
· Certified dynamic rope rescue.
· Hard material for vertical rescue.

- Anchors
- Rigid plastic stretcher (weatherproof material).
- Cervical collar.
- Medicine kit trauma type.
- Leg, arm, forearm immobilizers
- Radio communications

Institutional resources

According to the importance of the project for the department of Nariño and the rest of the country, the project must have the support of the following institutions for the care of events.

- Regional Committee for the Prevention and Attention of Disasters - Government of Nariño CREPAD
- Local and regional committees and disaster prevention
- Town halls of the municipalities of Imués, Tangua, Yacuanquer and Pasto. Institutions providing health services in the municipalities of the area of influence of the project.
- Army and National Police
- Civil defense
- Fire brigade
- Red Cross
- CORPONARIÑO
- Ingeominas
- IDEAM

Human Resources

These are given by committees and number conforming brigades that will be discussed later in this chapter.

Furthermore, to have the necessary resources for staff training use educational materials and technical information, hold community workshops, design of booklets and brochures.

Strategies for emergency care

The strategies herein described refer to all aspects that need to be activated by the institutions, individually or collectively, for a timely and effective execution of the emergency response.

Signage strategy

To handle emergencies caused by contingent events in the area of influence of the project, installation and ongoing maintenance of a signage system is required to help prevent the occurrence of accidents by implementing appropriate signage by contractors:

- Appropriate locations for pedestrian and vehicular traffic
- Places of likely occurrence of events where there is movement or stay of personnel
- Location of basic safety equipment (fire extinguishers, masks, etc. phones)
- Evacuation routes
- Muster points

Devices for traffic regulation shall be located on the site of the event, and will remain during there until removed once the conditions leading to their installation cease. When these activities are carried out in stages, only the signs that apply to existing conditions should remain in place and then removed. Flashing yellow lights with signals is allowed as long as it does not interfere with the visibility of other devices along the marked section. All signs used for this type of work must be retroreflective or covered.

If a single traffic lane in both directions is required, a limited distance away precautionary signage type go-stop will be used so vehicles to pass alternately. This situation may occur in a short span and with very good visibility have and not on curves. However, for longer sections, traffic will be regulated for correct circulation with controls at each end of the section and implementing flares, flashlights and traffic controllers.

Operations in areas with a single lane require a red clearance interval on the road; for such end, traffic controllers must perform coordination, control and operation tasks.

Strategy for emergency evaluation

The emergency evaluation must consider the magnitude of the event, the areas and resources committed by the emergency, the necessary resources for their care, external resources of the emergency services, the need for coordinating actions with authorities

and entities. The product of the emergency evaluation is to establish the degree of activation and the alarm level representing the event.

- Initial actions

These initial actions correspond to the first operational control measures aimed at the event to avoid a major emergency.

These measures may be taken by SST personnel or, in default thereof, by operations personnel as a contingency and prevention measure, provided that the procedures are predefined for emergencies within the lines of action, control charts, SOPs or operating procedures.

- Selection Emergency Degree and Alarm Level

The activation of emergency response resources depends on selected emergency degree, which is classified into low, medium or high level. It also takes into account the incipient level, which by its low impact on the environment or the person, can be handled with area resources.

The classification process includes evaluating emergency alarm levels according to business continuity planning. This alarm level is related to the emergency degree, caused damages, potential consequence, impairment of activity and viability of the answer.

The following capabilities and features were considered for alarm level classifications:

> **Incipient**: Event not representing an alarm for continuity of the project and is of exclusive interest to the operational or administrative areas.
> **Moderate:** Event than could represent an alarm for continuation of the project and is of interest for development of activities, road mobility or administrative and operational infrastructure.
> **Critical**: High likelihood event alarm for business continuity of interest to the organization.

The responsible for the incident is in charge of evaluating the emergency, while also evaluating the alarm level of the event, information submitted to the leader in charge according to the emergency degree. See Table 11.1.3.12

This order of main and alternate alarm communication should also function in emergencies or in case of incidents or events that do not represent an emergency.

Table 11.1.3.11: Emergency criteria classification

EMERGENCY LEVEL	CLASSIFICATION		
	GEOGRAPHYC IMPACT	SOCIAL IMPACT	PROJECT IMPACT
1	Evidence or imminence of a dangerous event. Event occurred at a specific site, partial impact to the road or sector for a specific time.	None at the moment, the needs can be handled by the staff and resources of the Concessionaire without affecting normal activities.	None
2	One or two specific sites affected	At least 5 people involved	At least one part of the project to respond was out of service and / or exceeded their responsiveness.
3	Widespread impact in a UF or three specific sites of impact on the road	More than 5 people involved	Full support from several municipal entities
4	Widespread impact within a UF or there are 4 specific sites of impact in the road	There are more than 50 people involved between dead and wounded	It requires support at the department level
5	Impacts more than 4 points, compromising development of activities or the road of at least 70%	Undetermined number of injured or dead	It requires national support

Source: Taken from decision making guide and adapted by Gemini Consulting SAS

Actions and decisions to deal with the emergency

Decisions and actions play an important role in preserve life; these actions must be developed according to the type of event. Figure 11.1.3.3

- Individual self-protection actions

Individual actions are critical in making decisions, therefore everyone who is involved in the project must be trained and workshops held to provide them with sufficient

knowledge and training to ensure and save their lives before any other action taken or commitment to do during the emergency. See Table 11.1.3.13

· Group actions

These actions require coordination and teamwork to protect themselves and help others in an organized manner. Like individual actions to successfully carry out these group actions, training and participation in workshops offers them the tools to manage the situation and correct decision-making; correct decision-making can mitigate material and human damage.

Actions to develop and which must focus on training activities and workshops are:

- First aid
- Evacuation and rescue
- Fire and explosion

· Decision-making

Aspects and skills that should be considered for decision-making is:

- Experience
- Good judgment and logical reasoning ability
- Creativity
- Quantitative skills
- Impact: Impact or influence of the decision in an emergency
- Quality: Personal qualities regarding labor and personal relationships.

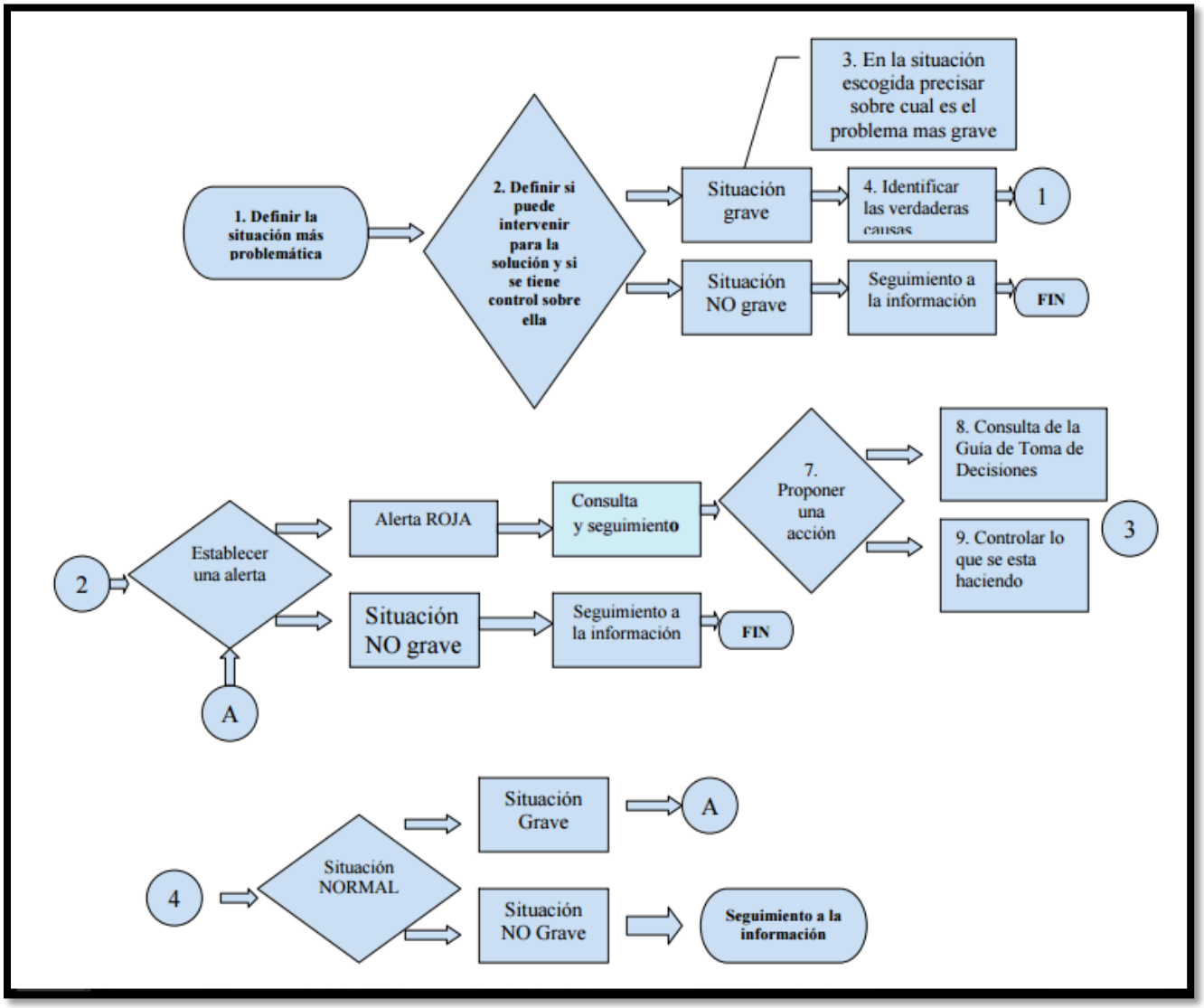
Table 11.1.3. 12: Decision-making

	OPERATIVE	EJECUTIVE	RESPONSIBILITY
DECISION	Decisions and activities based on direct and immediate emergency attention	Made based on operational needs or requests for a higher level	Made from the overview
RESPONSABLE	Coordinator of the Emergency Committee. Must make operational decisions to be executed by the brigades	SST Professional. Provides solutions raises requests and results level.	Concessionary Representative. Takes a result from the overview of the state of emergency, which depends on

	OPERATIVE	EJECUTIVE	RESPONSIBILITY
			the declaration of states of alert and activation of alert declared procedures.
FIELDS OF ACTION	First aid Evacuation and rescue Fires and explosions	Management and evaluation of decision-making	Information management and declares information, requests support from external agencies when required

Source: Taken from the decision-making guide and adapted by Gemini Consulting SAS

Figure 11.1.3. 3: Decision-making process in an emergency



Source: (Disasters, 2007)

Logistical support, equipment and infrastructure

- Internal support

The brigades are internal immediate response bodies in case of an event, responsible for monitoring and mitigating its consequences. They act as the first instance under the orders of the Emergency Committee Coordinator.

- External support

In order to ensure complete and effective communication in prevention, attention and emergency control, a telephone directory with direct lines of communication with local, municipal, regional and national authorities will be prepared. Table 11.1.3. 14 shows direct contacts of local, municipal, regional and national prevention, care and emergency management authorities.

The community is undoubtedly one of the main resources for the implementation of contingencies prevention and control plans. For this purpose, it is necessary to inform the community and local authorities on potential risks arising from the development strategies of the project.

Table 11.1.3.13: Support entities prevention, care and control emergency

ENTITY	CONTACT
Entities	
Imués Municipality	2 + 7297699
Tangua Municipality	2 + 8185624
Yacuanquer Municipality	2 + 8185954
Pasto Municipality	2 +7291919
Health institutions	
	Imués Empresa social del estado Santiago Apostol E.S.E. Barrio Libertad 7752112
	Tangua .S.E. Tangua Salud Hermes Andrade Mejia Brr El Carmen 2 + 7753000 Centro De Salud Hermes Andrade Mejia E.S.E. Tangua

ENTITY	CONTACT
	Nariño Brr El Carmen 2 + 7753000
	Yacuanquer Centro De Saludya E.S.E. De Yacuanquer Carrera 2 No. 9-18 7753083
	Pasto (main) E.S.E. Hospital Universitario Departamental De Nariño Carrera 22 No. 7-93 7214525 Hospital San Pedro Cl16 kr43 Esq 7336000 Clínica Fátima Calle 21 número 26 40 7333630 Clínica Hispanoamericana Carrera 41 No. 19D - 147 7333877 Empresa Social Del Estado Pasto Salud E.S.E. Kr 20 # 19 B 22 7201372 Hospital Local Civil Carrera 24 No 29-50 7213912
Red Cross	Pasto: Cr 25 No 13-26 729 8260-723 7448
Support Organizations	
Government of Nariño	2 + 7235003
National Police	127 Highway Patrol # 767
National Army	147
Firefighters	119/2 + 7215090
Civil defense	144
Ecopetrol emergencies	1+ 6616330-6616262
Toxicology (Chemical and Ophidian Accident)	01 8000 916012 (1) 2886012
Airport	2 7292000
Internal communication	
Concesionaria Vial Unión de Sur SAS	3173310921

Source: Gemini Consultants SAS, 2016

- Equipment and infrastructure

Each operational and administrative area should have available the necessary resources for emergency care, considering the project development characteristics.

Identified event risks and behavioral characteristics of events that could occur in the area of project development, are the basis for establishing fixed and mobile teams to care for people, spill control and fire control.

Each operating area should keep an updated inventory of the technological and physical resources they have, date of inspection, schedule preventive and corrective maintenance and ensure proper storage of this equipment.

Firefighting, spills protection and personnel attention equipment are classified as critical equipment, and therefore availability, inspection and maintenance measures are required, periodically and after each use.

- *Rescue teams and medical care*

Each area has basic first aid kit, stretchers and immobilizers both in mobile and stationary equipment for administrative and operational areas.

Table 11.1.3.15: Rescuers and medical care equipment characteristics

EQUIPMENT	DESCRIPTION	QUANTITY
Basic first aid kit	Immobilizer neck, upper limbs and lower limbs kit	1
	Precut sterile gauze packages	2
	Elastic bandage 4 * 5	2
	Eelastic bandage 6 * 5	2
	Package * 10 applicators and tongue depressors	1
	Roll micorpore adhesive bandages	1
	Band aids	10
	Saline solution	2
	Disposable masks	5
	Mono-goggles	1
	Lantern	1
	Ddisposable gloves medium and large sizes	5
	Cloth tape	1
	Scissors	1
Basic Rescue Kit	Harness for use in rescues	2

EQUIPMENT	DESCRIPTION	QUANTITY
	Mooring ropes or clamping	4
	Basket type stretcher	1
	Carabiners	6
	Descenders type eight	2
	Descenders type eights with ears	2
	Ascenders	4
	Knives or blades	2
	Pairs of work gloves with ropes	3
	Hard hats	3

Source: Gemini Consultants SAS, 2015

- *Spill control equipment*

The equipment required for each control point must be based on the type of product, water body containment conditions, product arrival rate, maximum volume to recover, conditions of maneuver yard, conditions of access to the site and preset infrastructure to control the spill. Table 11.1.3.17 includes a description of the spill control kit.

Table 11.1.3.14: Spill control kit description

EQUIPMENT	QUANTITY	DESCRIPTION
Internal Spill Kit	10	Absorbing barriers
	50	Tapes and absorbent pads capable of absorbing 50 gl
	5	Absorbent material crimper type for 40 kg
	100	Polypropylene bags for barrier construction
	1	Pike
	1	Shovel
	1	Maul
	1	Accessories for sealing leaks at low pressure
	1	Brush for cleaning areas
	1	Aragan for cleaning areas
	1	Temporary storage tank
	1	Chevron degreaser for cleaning areas

EQUIPMENT	QUANTITY	DESCRIPTION
	5	Warning tape
	2	Floor signs
	2	Flashlights
	2	Gloves
	2	Safety glasses
External Spill Kit	10	Absorbing barriers
	50	Tapes and absorbent pads
	1	Encapsulation type absorbent material type
	300	Polypropylene bags for barrier construction
	3	Pike
	3	Shovel
	3	Maul
	2	Temporary storage tanks
	5	Chevron degreaser for cleaning areas
	5	Warning tape
	2	Flashlights
	2	Gloves
	2	Safety glasses

Source: Gemini Consultants SAS, 2016

To ensure correct storage of mobile equipment and provide the necessary transportation resources to the sites where they may be require.

Storage warehouses must be located for easy and effective arrival and ensure proper transfer of emergency response equipment in the area. The maximum travel time should not exceed one hour in order to ensure adequate emergency response.

The amount of equipment to activate a control point can be distributed in more than one warehouse, provided mobilization times required for primary responses are met and that necessary resources for mobilization of equipment are available.

Part of the equipment required at a control point can come from one or more warehouse more than two hours away, by means of dedicated transport, provided that equipment can arrive before the two-hour travel time, are sufficient to meet the control

and protection needs until the remaining equipment is installed and available for operation.

· Emergency road equipment

There are two types of emergency equipment and supplies: emergency kit carried by each tanker truck, and equipment and materials for emergency control points on the road. The Emergency Kit includes spills Kit and basic road vehicle equipment. See Table 11.1.3.18

Table 11.1.3.15: Tanker truck emergency kit

DESCRIPTION	QUANTITY	FEATURES AND USAGE
Oleophilic Material	1	Roll of oleophilic material to absorb spilled oil.
Pail	1	12 liter plastic bucket to collect spilled product.
Chipa type wire	1	Chipa sweet wire to tying objects.
Plastic	1	Plastic 0.25 mm thick to temporaryly waterproof areas.
Industrial black bag	10	Collection of material contaminated with oil.
Tarpaulin	10	Fiber tarpaulins to build natural containment barriers.
Traffic cones	2	Two large and two small cones for to indicate emergency areas.
First aid kit	1	For immediate care (first aid).
Flashlight	1	12-volt explosion-proof flashlight for night work sites or in poor visibility.
Wooden wedges	4	Every vehicle entering the project area should have blocking and immobilizing devices
Hammer and spark-proof shovel	1	Used to nail objects.
Hacksaw	1	To cut metal parts.
Reflective vest	1	Personal protective element so people on the road or in the loading and unloading material areas can easily see personnel
Rope	4	Used for mooring objects.
Triangles	2	Emergency vehicle signs
Soap	2	Two bars of industrial soap to plug holes.

DESCRIPTION	QUANTITY	FEATURES AND USAGE
Shovel	1	To open ditches divert to spills.
Fire extinguishers	1	20 lb extinguishers to fight small fires.

Source: Gemini Consulting SAS

Tanker truck operators must have proper training in handling the emergency kit. Table 11.1.3.18 lists kit products for control points.

Table 11.1.3.16 Contingency kit for control points

DESCRIPTION	QUANTITY
4 "5 HP motor pump with 3" and 4 "caps and fittings	1
3 " hose with quick coupling	1
4 "hose with 2 quick couplings	1
12x6 " PVC nipples	3
36x6 " PVC nipples	3
6 " PVC elbows	3
Large 70 cm cone	4
Small 45 cm cones	4
12 liter plastic buckets	10
Shovels with rope	10
Pikes with rope	10
Hoes with rope	12
Bar	1
Machetes	2
Fiber tarpaulins	100
Fiber rolls	1
Industrial red plastic bags	100
Manila 50 m	1
30 lb extinguishers	4
Plastic 0.25 mm thick	1
8 "diameter x 10` long absorbent material barriers	5
Oleophilic fabric roll 144`long x 38 "wide x 3/8 thick	1

DESCRIPTION	QUANTITY
Oleophilic cloth pads 17 "x 19" x 3/8 thick	100
OilGator® (Absorbent Biodegradable) saxs	10
P-602 neutral solvent 60 liters keg	1
P-x37 neutral solvent 60 liters keg	1
18 "x 50`Meco type barriers	2
Sign roll tape	1
1000 Gal FastTank (Tank Quick Arm)	1
55 Gal cans	5
Stop-go paddle signs	2
Reflective vests	2
Hard hats	2
Security boots	2
Nitrile Cuff 13 "(pairs)	2
Rawhide gloves (pairs)	4
Particulate filter masks N95	6
Mono-goggles	6
12 volt lantern	6

Source Gemini Consulting SAS, 2016

11.1.3.1 Risk knowledge

Knowledge of the actual risk and conditions of local risk allows understanding contingent implications of the staging of a disaster and be a support to structure management processes, risk reduction and disaster management on which this plan was developed.

Identification, prioritization and characterization of risk scenarios

· Identification of scenarios

The following scenarios were identified with the likelihood of an emergency occurrence according to the results of the risk rating where high is: earthquakes, traffic accidents, landslides and volcanic activity.

- Work sites on a surface road
- Fronts work on bridges

- Industrial facilities (crushing and concrete plants)
- Existing road, in the section where this project is executed
- Existing road, in sections located outside the current project
- Waste disposal areas for excavated material
- Population centers and houses located in the area of influence of the project

· Identification of emergencies

Reported emergencies because of a natural, anthropic or technical event are usually:

- Injured people
- Trapped people
- Missing people
- Trapped equipment
- Loss of equipment
- Equipment damage
- Building material loss
- Environmental damage

Risk analysis and evaluation

The study and knowledge of the risks, the implementation of emergency plans and warning systems, performing hazard maps and risk, development of preventive measures, consistent and proper planning, etc., are necessary measures to live with these phenomena and mitigate or prevent losses associated with them.

Identifying threatening events and vulnerability analysis were set out in this chapter in title Threat evaluation of vulnerable elements. See Table 11.1.3.20

Based on the classification of threats and vulnerabilities identified, the risk assessment was performed with the following results.

Table 11.1.3.17: Risk Rating

MATRIZ CALIFICACIÓN DEL RIESGO							
AMENAZA	Frecuente	5	Presencia de animales		Accidentes de transito		
	Moderado	4		Situaciones de ordén público	Remoción en masa	Actividad Volcanica	
	Ocasional	3		Accidentes de trabajo	- Acciones terroristas -Incendios forestales -Daños a redes de servicios públicos -Derrames de sustancias químicas	Movimiento telúrico	
	Remoto	2					
	Improbable	1		Inundaciones			Manejo de Explosivos
	CALIFICACIÓN		Insignificante -1	Marginal -2	Crítico -3	Desastroso -4	Catastrófico -5
VULNERABILIDAD							

Source: Gemini Consulting SAS

Follows the different figures with the identification of the risk level for each of the threats evaluated in the area of influence.

- Landslide phenomena risk

For the study area, the level of risk from landmass removal phenomena mass removal was established as low, as shown in the following figure.

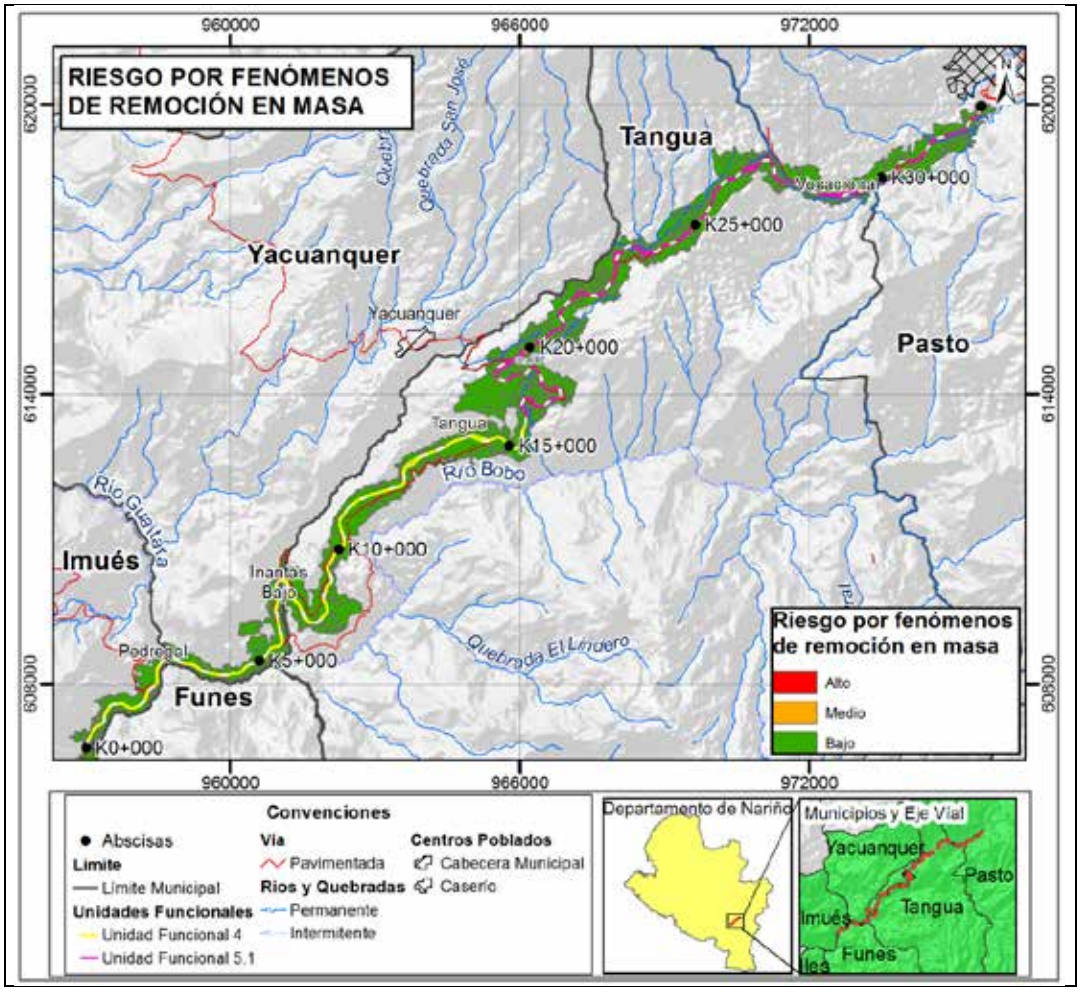


Figure 11.1.3.4 Risk from landslides phenomena

Source (Gemini Environmental Consultants, 2016)

· Flood risk

For the study area, the level of risk from floods was established as low, as shown in the following figure.

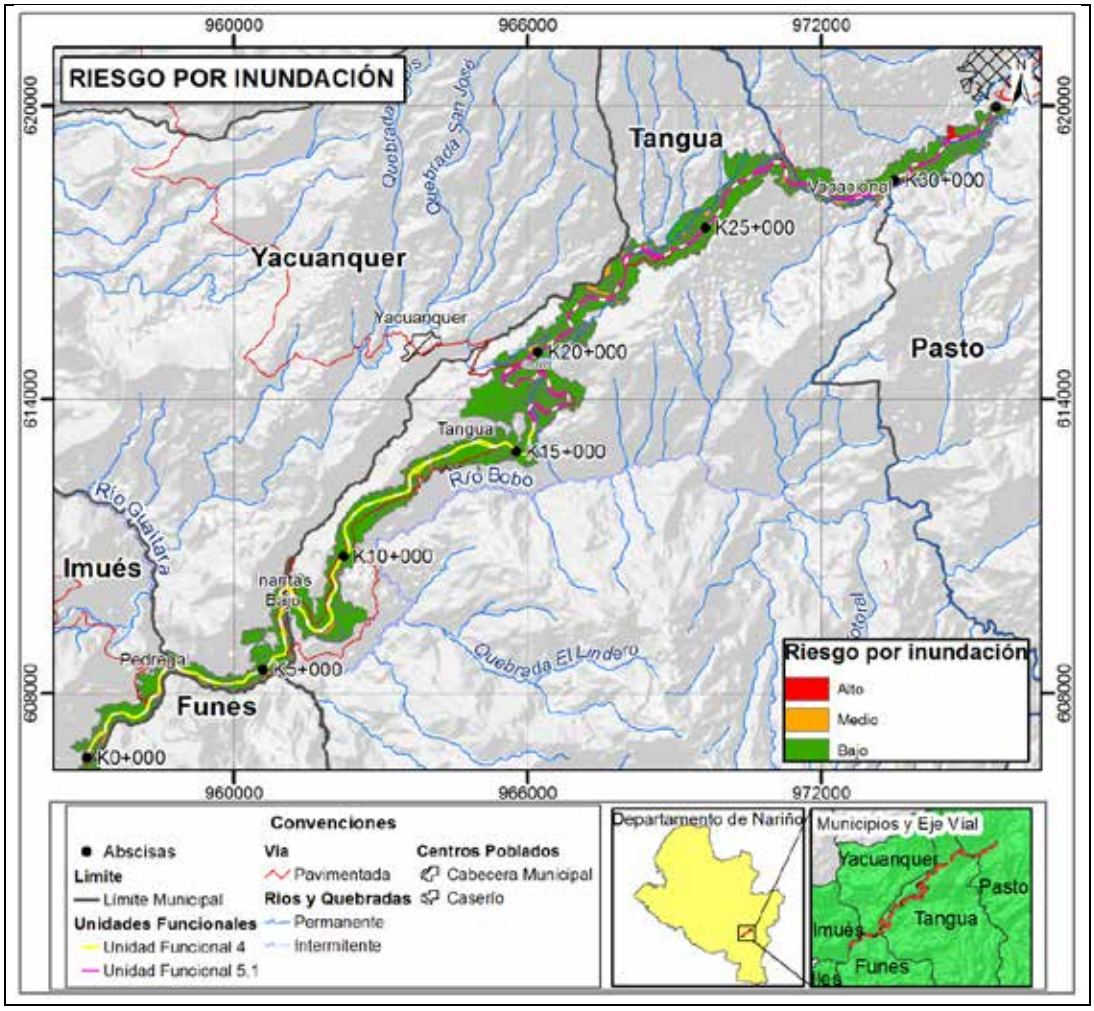


Figure 11.1.3.5 Flood risk

Source (Gemini Environmental Consultants, 2016)

· Seismic risk

The study area presents high scenarios and environmental risk mainly due to the type of geology in the area. High risks are located on populated areas, whether municipal districts or urban areas, as shown in the following figure.

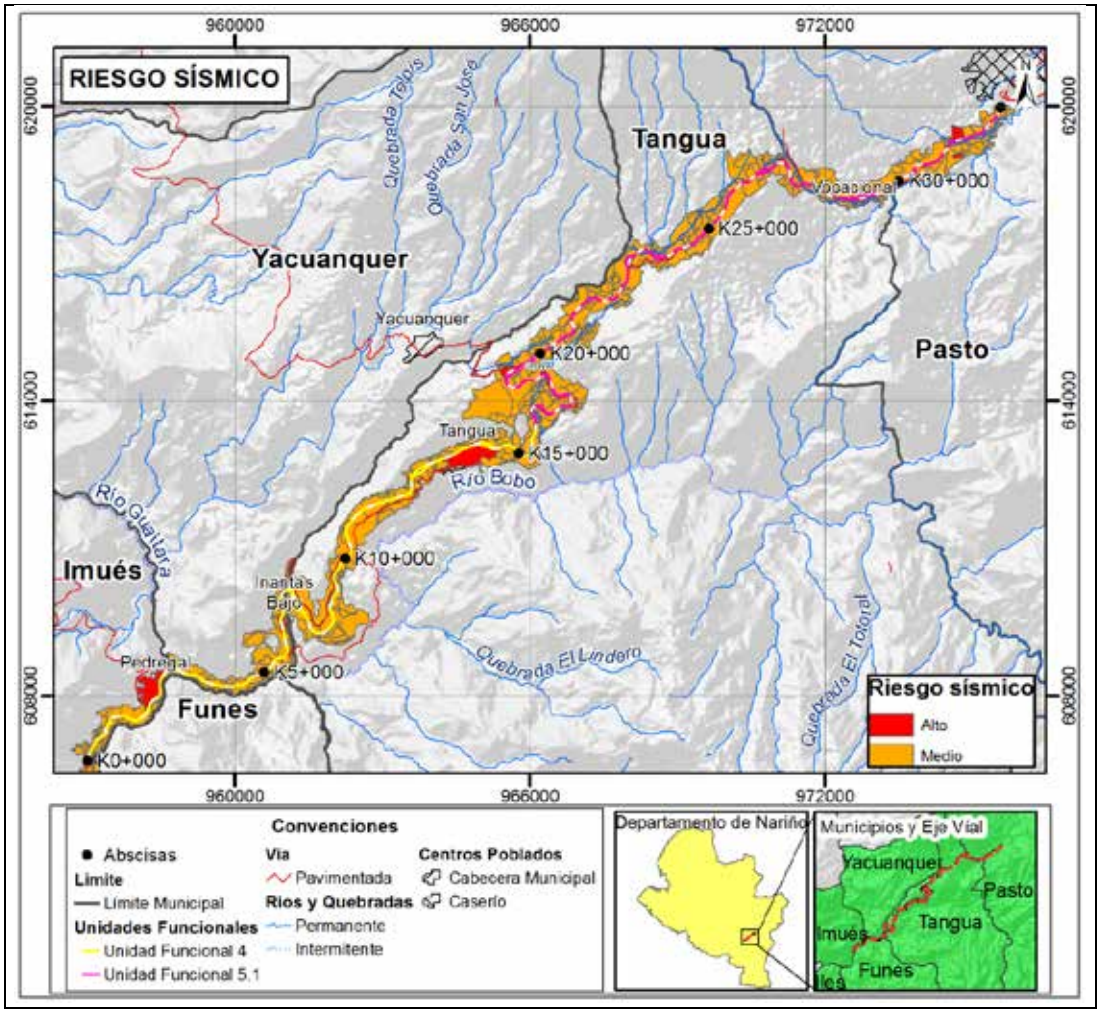


Figure 11.1.3.6 Seismic risk

Source (Gemini Environmental Consultants, 2016)

· Volcanology risk

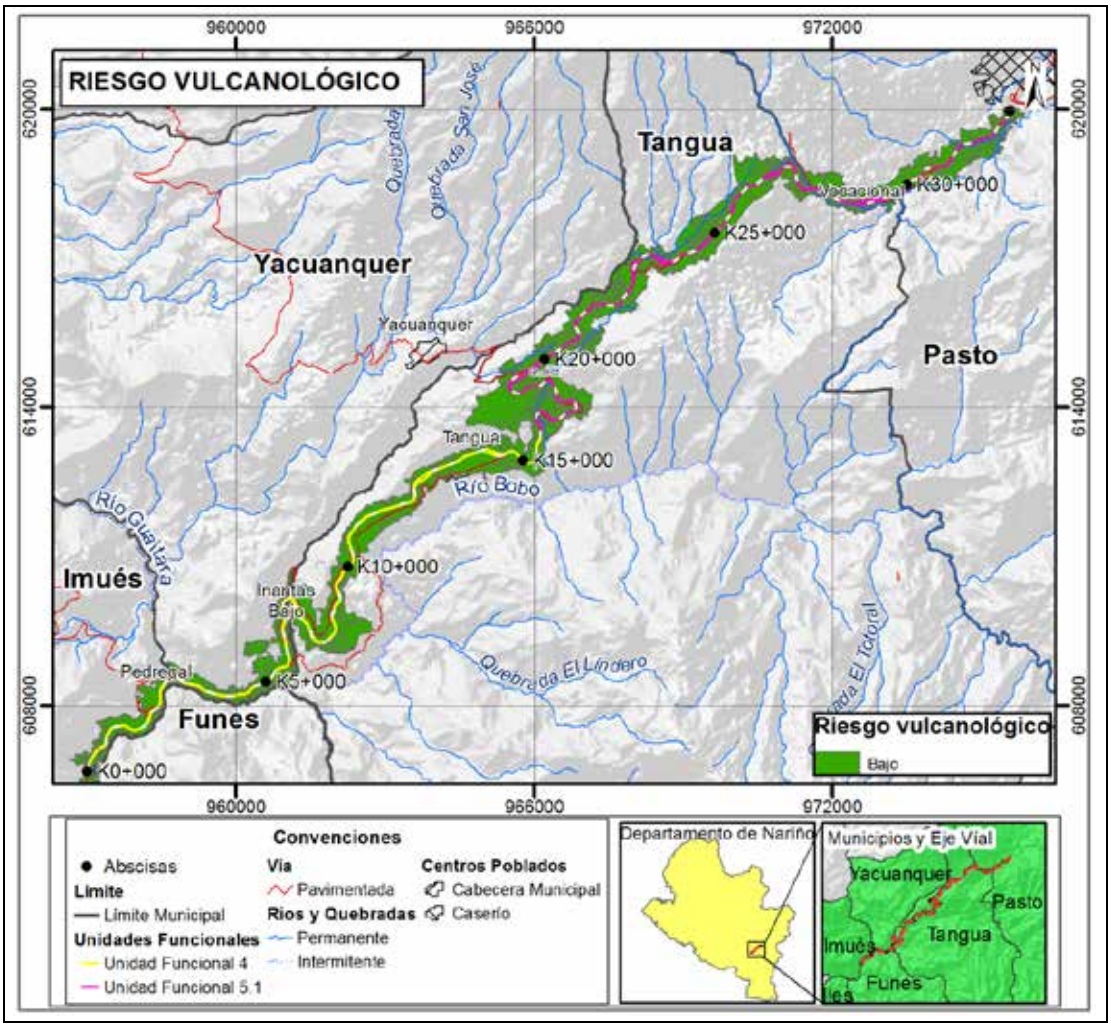


Figure 11.1.3.7 Volcanology risk

Source (Gemini Environmental Consultants, 2016)

Identification and location of the measures to be taken

From the results of the risk ranking and analysis thereof the following is conclude:

· Unacceptable risks

Corresponds to earthquakes, volcanology activity, landslides and traffic accidents, with a high likelihood of occurrence and the need to develop priority and immediate actions for protection and prevention due to the high impact they would have on the environment.

· Tolerable risk

Natural, anthropic and technical events were found, which are considered average but the occurrence must not be ruled out, so project staff should be trained on the measures to take and external entities they can turn to for support.

Actions by armed groups outside the law, forest fires, damage to utility networks, chemical spills, industrial accidents, and public order situations can cause irreversible damage to the integrity of life of people and in some cases the environment; these processes can occur along the corridor.

To note that terrorist actions from groups outside the law and public order situations are alien events susceptible to the security conditions of the country or simple vandalism against the infrastructure and development of the Project.

· Acceptable risk

Acceptable risks require minor procedures given the physical and topographical conditions of the area of influence such as threats by the presence of animals, floods and handling explosives, which is an activity considered with low likelihood of occurrence because it is not planned in development activities.

11.1.3.2 Risk Reduction

Achieving risk reduction is the action of implementing proposed measures based on the analysis of results and risk classification. This document involves the possible emergencies that may arise in development of the activities under the project.

Strategies

The strategic plan is geared to workers and personnel contracted for the project as it can trigger events and / or may be affected by them. In relation to the surrounding community, the different Risk Management Plan actions are aimed at developing concerted actions with the Regional Committee for the Prevention and Attention to Disasters - Nariño - CREPAD and administration and municipal entities so that in the

event of a contingency, an appropriate intervention can be carried out to reduce the effects thereof on the community's area of influence.

Supports of compliance with the obligations under the respective action plan will be presented in the Environmental Compliance Reports.

The fundamental concept on which the plan design is based, is to inform and train all workers so that they are able to act and protect their health and integrity, in the event of an actual or potential emergency.

To handle emergencies optimally, an emergency brigade must be formed, trained and equipped commensurate with the level of risk and available resources, including first aid care, evacuation and rescue and fire and explosions and an outreach strategy.

· Outreach strategy, and training

The objective of the outreach programs and training designed for Project is to involve operational and administrative personnel and contractors in prevention and emergency attention, so the emergency response will be the most suitable and appropriate by providing this attention safely and properly.

Outreach and training seek to publicize the operational and personnel risks during project development, know how to act at the time of an incident, in order to safeguard the life, the environment and the operation.

One of the strategies to maintain the PGR is to communicate it to all personnel involved in the project, so that potential risks are identified and their management alternatives for prevention and control.

Training is one of the main principles in the risk management plans, because during training measures for different emergency scenarios are shown, how to act and how to prevent these incidents. drills and exercises are performed representing real emergency conditions at the site where resource uses occur in the area, handling equipment, emergency response, evacuation, transportation, emergency assessment, alarm activation, etc.

The training seeks through specific training to develop skills in tactical personnel and operational groups responsible for emergency care, so that these are identified and controlled in the shortest time possible.

Such exercises are vital for emergency response personnel, rescue workers and contractors during an incident and / or emergencies, identifying and communicating it in a timely manner, using the resources properly.

Plans and programs aimed at dissemination and training on the Risk Management Plan must be prepared. Table 11.1.3.20 defines the frequency and parameters the project's Head of RMP must considered for the development of outreach plans and programs and personnel training in the field of prevention and emergency response.

Table 11.1.3.20: Outreach and Training frequency and parameters

TARGET POPULATION	ACTIVITY	SUBJECT AREA	FREQUENCY
Strategic Personnel	Dissemination	Risk management, IT Plan Response Scheme	One (1) year, covering all strategic personnel
Tactical Personal (Involve mutual aid plan representatives)	Dissemination	Risk management, Implementation of plans, IT Plan, Control Strategies, Response Scheme, Response procedures and control techniques	One (1) year, covering all the tactical personnel
	Training	IT plan, Control Strategies, Control Techniques, Incident Command System	One (1) year, covering all the tactical personnel
Operating personnel (Should engage relief agencies and members of mutual aid plan)	Dissemination	Emergency identification and notification, IT Plan, Information Update, Control strategies, Scheme response, Response procedures, Control techniques	One (1) year, covering all operational personnel
	Training	Updating information, Response Procedures, Control techniques, Command system	One (1) year, covering all operational personnel
	Training	Control techniques	One (1) year, covering all operational personnel

TARGET POPULATION	ACTIVITY	SUBJECT AREA	FREQUENCY
General personnel	Dissemination	Emergency identification and notification, Response scheme, Initial control actions, Evacuation and medical care	One (1) year, covering all personnel
Community in the direct area of influence and communities in critical areas	Dissemination	Risk of the operation, identification and emergency notification, control Initial actions	One (1) year covering the entire community in the direct and indirect area of influence in critical areas
Authority and entities involved	Dissemination	Preparation activities, IT Plan, Control Strategies, Scheme response, Response procedures, Control techniques	One (1) year covering all local authorities in the area of direct and indirect influence of critical areas
Strategic, tactical and operational personal, Authorities and Institutions	Drill	Higher degree activation, medium degree activation	One (1) year, or by operating units for the field
	Drill	Operational control in emergency or critical operational events drills, widespread evacuation in administrative areas drills	Two (2) per year for operational or administrative unit
Tactical and operational staff	Drill	Operating response training	Two (2) per year for operating units or for the field

Source: Guide for Planning and Emergency Response

Event Control Strategy

In order to provide efficient management of prevention, attention and control of emergencies, action plans for each of the risks classified Medium, High identified for project development have designed; these plans should be reviewed and updated periodically. The event control strategies were prepared taking into account the risk rating.

· Control strategy high risk events

In this regard we have strategies for earthquakes, landslides, volcanic activity and traffic accidents, as described below.

- *Earthquake plan*

Seismic events in these types of projects are often related to destruction of camps, slope excavation impacts and landslides that could affect personnel as well as machinery used in any stage or phase of the project. Contingency measures are:

During the earthquake

- Keep calm
- Immediately stop what you are doing
- Take refuge in a safe place, under a desk or a strong structure, away from windows or objects that could fall on you, in or under a vehicle, next to a column or inner wall, protect your head and neck with your hands.
- Stay there for the duration of the earthquake and motivate others to do the same
- Do not rush out even if the alarms are sounding

After the quake.

- Keep calm.
- Help those in need
- Report any abnormal situation, be specific and do not jam the phone lines.
- Do not turn electrical equipment or electrical installations on until you are sure there are no gas leaks or short circuits.
- Evacuate the building if serious conditions that indicate structural failure or imminent risk to people are observed
- If the order to evacuate is given do so immediately in accordance with the established plan

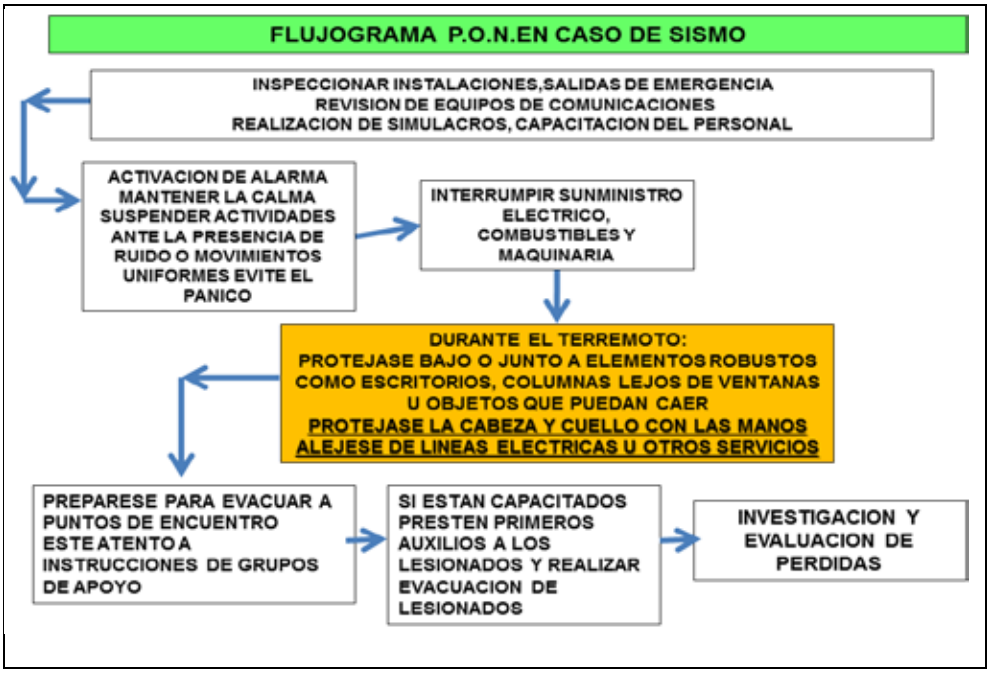


Figure 11.1.3.8 Flowchart in case of an earthquake

Source (Gemini Environmental Consultants, 2016)

- *Plan for landslides processes*

Landslides can be produced by an earthquake, heavy rains, flooding or poor operations in excavations and fillings.

They relate to affectation of slopes in excavations and landslides that could affect personnel and infrastructure at any stage or phase of the project.

This can affect e.g. water resources, soil, personnel present in the project area, associated infrastructure, and finally the project itself. Preventive measures are as follows:

- Overtaking excavation and operation activities of the fills according to the design (cut, height and inclination of the slopes, construction of drainage works, etc.).

- Continuously check that the designs are consistent with the reality found in the field, in order to make any required modifications.
- Keep a tight control of stability changes of excavations by monitoring geotechnical conditions.

In turn contingency measures to consider are:

- Geomorphodynamic phenomena such as landslides will be controlled using techniques designed for such purposes (stake fences, crown ditches of slopes, ditches, revegetation, etc.)
- In case of landslides and depending on their magnitude, communicate with pertinent authorities and prevent people and vehicles from entering into affected area with proper demarcation and signage. If necessary, evacuate people at risk; subsequently reshaping works will begin taking care not to cause further sliding.

- *Volcanic activity procedure*

This occurs when there is presence of ash, dust, lava from magma-laden gases during an explosive eruption; these materials are formed as the magma rises up the chimney where the gases expand rapidly by decreasing pressure. When an eruption occurs, generated ash is dispersed by certain areas depending on the direction of prevailing winds.

Falling ash darken the day generating an overnight sensation in broad daylight; this is the first warning sign to consider. See Figure 11.1.3.4

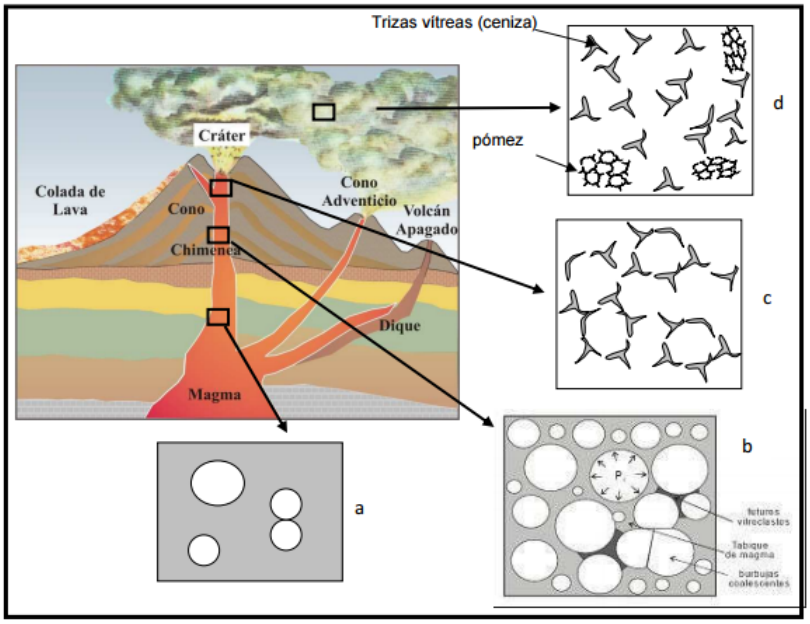


Figure 11.1.3. 4: Origin of volcanic ash
Source: (Assets, 2011)

To alert the situation the committee will be responsible for carrying out the plan where the following measures should be taken into account before a yellow alert is clear that at a red alert to evacuate the area and follow the steps to take arranged by the Colombian Geological Survey.

Health measures

- nasal and throat irritation: May cause burning, dry cough and runny nose increased.
- breathing becomes difficult.
- Eye Irritation: one feels the presence of foreign particles in the eye.
- Pain and itching eyes
- sticky discharge and tearing
- corneal injury or conjunctivitis
- Skin irritation
- Dermatitis with inflammatory processes, can produce erythema or desquamation.
- Secondary infections scraped

Prevention measures

- Use a mask or wet cloth handkerchief or a polar neck covering eyes and mouth.
- Wearing protective glasses and avoid wearing contact lenses. No rub his eyes, wash eyes gently with water.
- Wear long sleeves, keep most of the roof skin and hair. Toilet paper with hand and body soap. Using moisturizer.
- Maintain hydration.
- Keep doors and windows closed.
- Use wet rags on doors and windows.
- Coordinate with neighbors cleaning sidewalks.
- Clean the roofs of houses and canals.

Emergency eruption:

- Have battery powered radio as reporting mechanism to meet the security, shelter sites and evacuation measures organized by the provincial government.
- Stay at home or return to my home in peace. Ashfall given time to develop tasks calm.
- Keep track of the actions to be taken, protective measures and the characteristics of the event.
- If you must go protect your sight, and use a tissue, mask or wet cloth to protect airways.
- Avoid using single vehicle, do so only in cases of extreme necessity. Vehicle movement will aggravate the situation of ash in the air, and your car may be damaged.

- *Vehicular Accident Action Plan*

Motor vehicle crashes are the main risk in the activities of transport of personnel, equipment, machinery, chemicals, fuels and waste. Collisions are the recuentes when mobilizations accidents, they can leave from simple damage to fatalities. See Figure 11.1.3.5

Action plans for vehicle accidents within the Draft, They are:

- simple collisions: collisions where there are economic losses of less cuantiar, no injuries no fatalities, there may be damage to vehicles. When such incidents occur, it is important signaling area and collecting evidence in order to conduct relevant research.

- Collisions with injured: are incidents where injuries are generated people, in some cases can lead to fatalities, when presenting this incident, it is advisable to request such immediate health care team, do not move the injured, and perform the procedures established by the road authorities.
- In case of fatalities, should not move bodies and must wait for the competent authority to produce the accident report. Request the national police presence care product. The driver involved in the incident does not assume any liability for the company for damages another vehicle or killed. Their obligation is limited to the respective authority acting in preparing the report.
- Who detected the incident should immediately report to local relief agencies including transit (call line 123) Communicate clearly and completely what happened, including coordinates or waypoints to locate the site of the incident.
- After giving notice, call the Supervisor and / or Manager. The supervisor and / or manager must give notice of the situation the head SST following the established procedure for reporting incidents.
- Place signs in the incident area to prevent others at that time.
- Report quickly if patients trapped or lost, for additional support.
- If there are associated risks (fire and / or explosion), quickly evacuate to a safe area.
- If there are serious injuries, they should be the first to be transferred to a hospital.
- In case of injury, bleeding and / or fractures, apply first aid.
- Never leave to (the) injured (s).

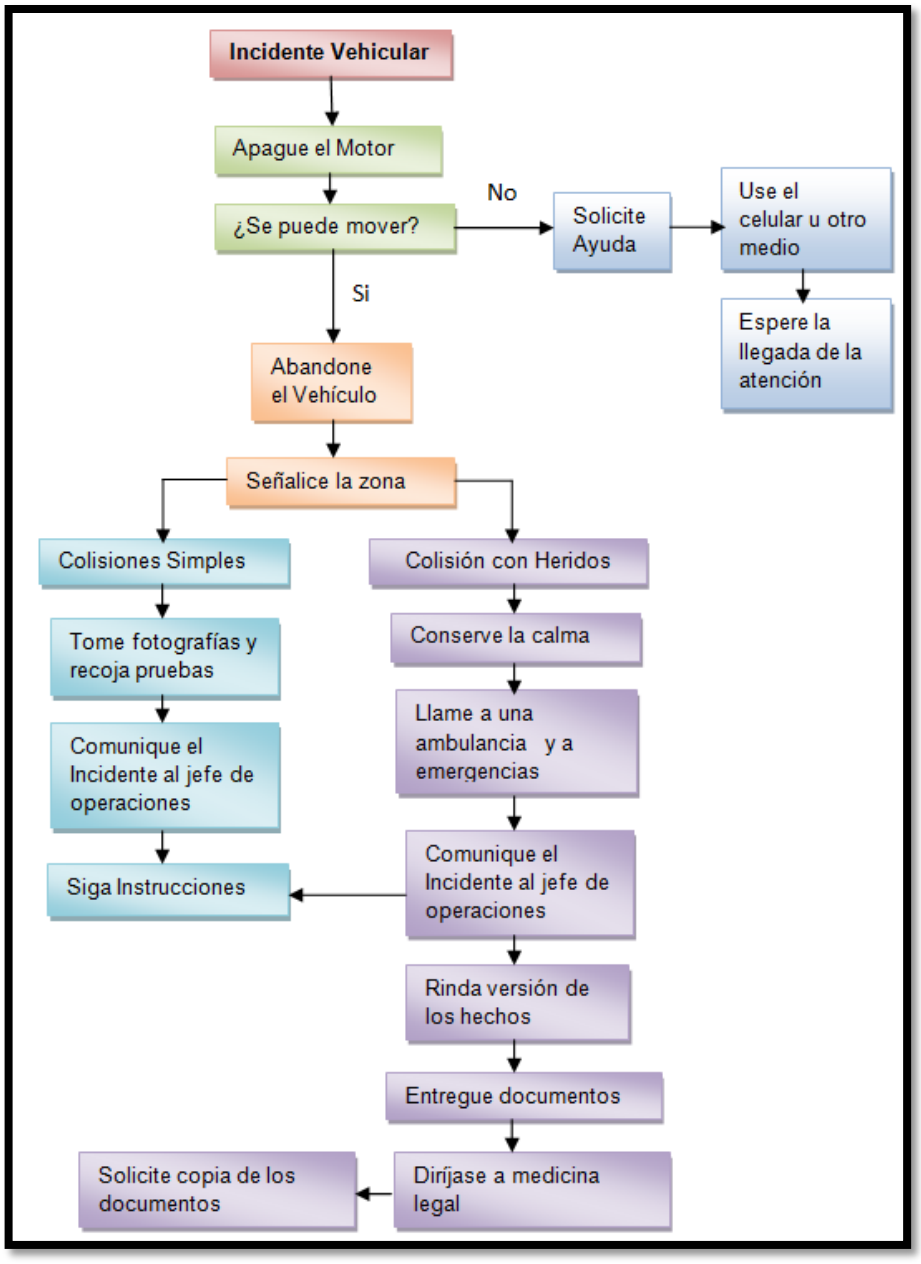


Figure 11.1.3. 5 Vehicular Accident Action Plan
Source Gemini Consulting SAS, 2015

· Strategy medium irrigation control events

For medium risk events was considered vitally important to the action plan for each of these, because although the probability of occurrence or impact may be less than it is vitally important to consider procedures to address these:

- *Fire Action Plan*

The fire control plan is based on four stages to control them, which are:

- Prevention
- Detection
- Suppression
- Evacuation

Within prevention it includes:

- Classification of areas of emergency (fire)
- Selecting the appropriate electrical equipment to the area acurdo
- Identification of risk and resources for emergency response
- Perform an inspection program for equipment and technological resources, as well as a training program for handling emergency fire

For detection of emergencies caused by fires, they can be identified four elements or fire signals, which are; heat, articulated material light radiation and presence of gases.

For suppressing or extinguishing a fire is, there are four methods, which are:

- Method 1: Physically separating the combustible substance of the flame.
- Method 2: Eliminating or reducing the amount of oxygen.
- Method 3: Reduce the temperature of the fuel or flame.
- Method 4: Apply chemicals that modify the combustion chemistry.

Depending on the agent used (water or foam) in extinguishing a fire, this will involve various methods of fire as shown in Table 11.1.3. twenty-one.

Table 11.1.3.18: Methods in firefighting

METHOD	SOLID FUEL FIRE BURNED OUTDOOR - APPLYING WATER	CONTAINER FOAM TO IMPLEMENT flammable liquids
1	Water, as a mist, can prevent heat radiation	The foam prevents radiant heat from going to the surface
2	Steam is generated, which in certain conditions and indoors, can prevent oxygen from reaching the fire	The foam over the flammable liquid prevents oxygen from reaching the fuel
3	The solid is cooled by contact with water Cool flame gas	If the ignition point of the flammable liquid is higher than the temperature of the foam, the liquid cools and diminishes its vapor pressure
4	This reduces the speed of pyrolysis or gasification Causing a feedback reduction heat the solid fuel and a corresponding reduction in the speed of endothermic pyrolysis	It helps supply the heat required for vaporizing

Source Gemini Consulting SAS, 2015

For operational areas, it is necessary to have portable fire extinguishers and fire water supply. For the selection of these should be taken into account: The nature of the combustibles.

- Environmental conditions of the site where the fire extinguisher placed.
- Who will use the extinguisher.
- If there are chemicals on site that may adversely react with the extinguishing agent.
- Type of fuel in the area
- Type of fire
- Design inspection and maintenance programs

If the fire is in your area.

- Keep calm
- Immediately stop what you are doing
- Alert the local people (visitors) SAYING THE WORD FIRE, ask them to evacuate.
- Notify or ask someone to report the emergency.
- Help people who require it.
- If risk for you evacuate immediately.

- If the fire can be controlled with the means available, verify that no people nearby, have someone stay with you and try to control the emergency if safety is not affected.
- If the fire is large and out of control do not try to expose, evacuate immediately, secure the adjacent areas and avoid the entry of others.
- On leaving the building to relief agencies report details of the situation.

NOTE: Any situation that generates smoke and not fire, facilities must be evacuated.

If the fire is in another area:

- Keep calm
- Immediately stop what you are doing
- Take your personal belongings only if you have close
- If visitors have to tell them what is happening and manifiésteles they should remain calm and follow the evacuation order according to personnel.
- Evacuate immediately meeting places.
- If there is smoke crawl.
- Before opening a door touch it, if it is hot do not open and take an alternate exit
- If you become trapped by smoke try to put up a shelter, seek as close as possible, with exterior windows with rags or wet clothing cover all areas for which you can enter smoke space, place a signal or alert you had to refuge there.

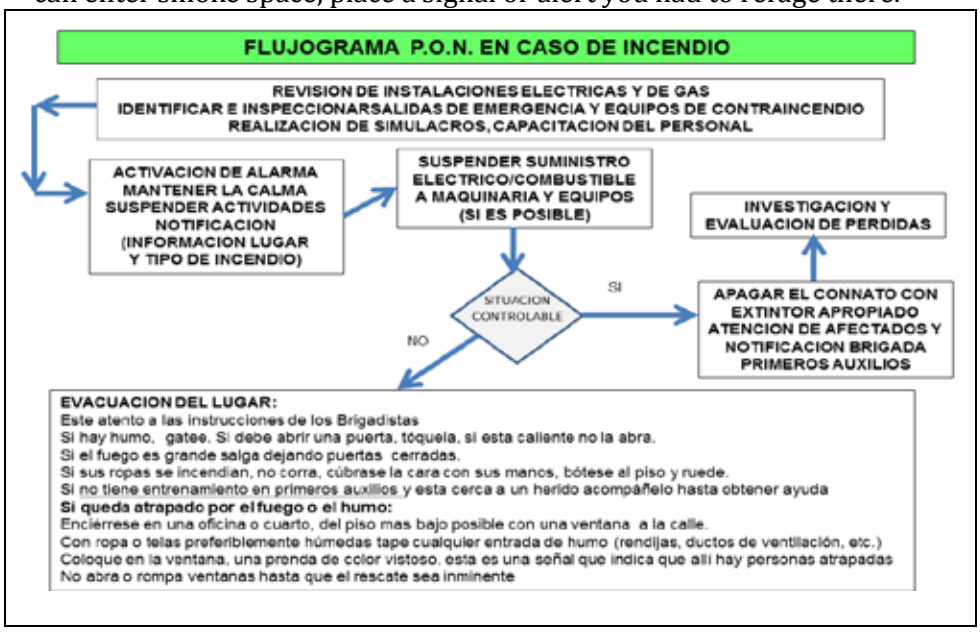


Figure 11.1.3.9 PON flow chart in case of fire

Source (Gemini Environmental Consultants, 2016)

In case of explosion

- Keep calm.
- If you have personal visitors tell them what is happening and manifiésteles that must remain in place, and follow the instructions below:
- Drop to the floor under a desk or a strong structure, away from windows.
- Protect your head and neck with your hands, open your mouth and do not rest your belly on the floor.
- Wait blast subsides.
- Help those in need.
- Report any abnormal situation, is concrete and not congested telephone lines.
- Do not turn electrical equipment or electrical installations until you are sure that no gas leaks or short circuits.
- Evacuate the building if it detects conditions that indicate serious structural failure or imminent risk to people.
- If the order to evacuate, do so immediately in accordance with the scheduled plan, being located at least 300 meters away from the building is given.
- Keep off electronic equipment like cell phones, beepers, radios and so on, to avoid possible activation of more explosions
- Go to the meeting place and wait for instructions.

Figure 11.1.3.10 PON flow chart in case of explosion

Source (Gemini Environmental Consultants, 2016)

- *Action Plan chemicals spills*

ü ***Before***

- Knowledge of Safety Data Sheets chemical or special substance that must be handled.
- Dissemination of Hazard and Risk Matrix
- Linking the worker to the social security system
- Performing own entrance exams and Epidemiological Surveillance System
- Worker training standards and procedures for safe work
- Delivery of EPP own for activity.
- Training in the use of PPE.
- Disclosure of the emergency plan

ü ***When emergency occurs***

Identify the substance and assess the incident

- Evaluate the area.
- Locate the source of the spill or leak.
- Search tag to identify the hazardous substance content and risks.
- Resorting to MSDSs.
- Identify potential risks in the course of the spill, such as materials, equipment and workers.
- Write down everything observed to adequately inform the superior command
- Try to stop the spill or leak only if it can be done safely. Fix at the origin and stop the spill liquids with absorbent materials. At this stage you should use personal protection.
- Avoid direct contact with the substance.

Notify superior command

- Provide all information that may direct supervision, to be appropriate to control the emergency. This includes equipment, materials and affected areas. Noting location, substances involved, number, address and current condition.
- Find more information and resorting to external advice if necessary.

Secure the area

- Alerting other colleagues about the spill and keep it close.
- Ventilate area
- Cordoned off with barriers, surrounding the contaminated area
- Surround with absorbent materials equipment or materials
- Off any equipment or ignition source
- Have some means of fire extinguishing.

Control and contain the spill

- Before starting control or containment of the spill, place the necessary personal protective equipment.
- Locate the source of the spill and control the problem at this level.
- Contain barriers and / or absorbent materials. They can be used: sponges, absorbing cords or special equipment such as vacuum cleaners.
- If the problem is outside, make land barriers and ditches.

Wash contaminated area

- Try to recover the substance
- Absorb or neutralize. In the case of acid or base be neutralized (with sodium bicarbonate for example)
- Wash contaminated area with water, if there is no contraindication
- Signpost containers where are deposited waste. All the products should be treated as hazardous waste.

Decontaminate equipment and personnel

- Have a decontamination area
- Washing equipment and clothing used
- The people involved in the decontamination must bathe

FINAL DISPOSITION

Regarding the environmental management of waste and by-products of these substances should not present any downloads in public sewers or water sources, or throw them into landfills or open dumps; These residues or by-products must be collected in special containers (Resolution 2400, 1979), if it is liquid chemical wastes, but if the waste is solid, semisolid or gelatinized, must be collected properly marked containers, which remain plugged in temporary storage site for treatment then send them to an authorized waste manager that meets legal requirements.

- Keep container closed when not in use
- Avoid free fall of liquid over a few centimeters
- Keep away from sources of heat.
- Use recommended projection elements.

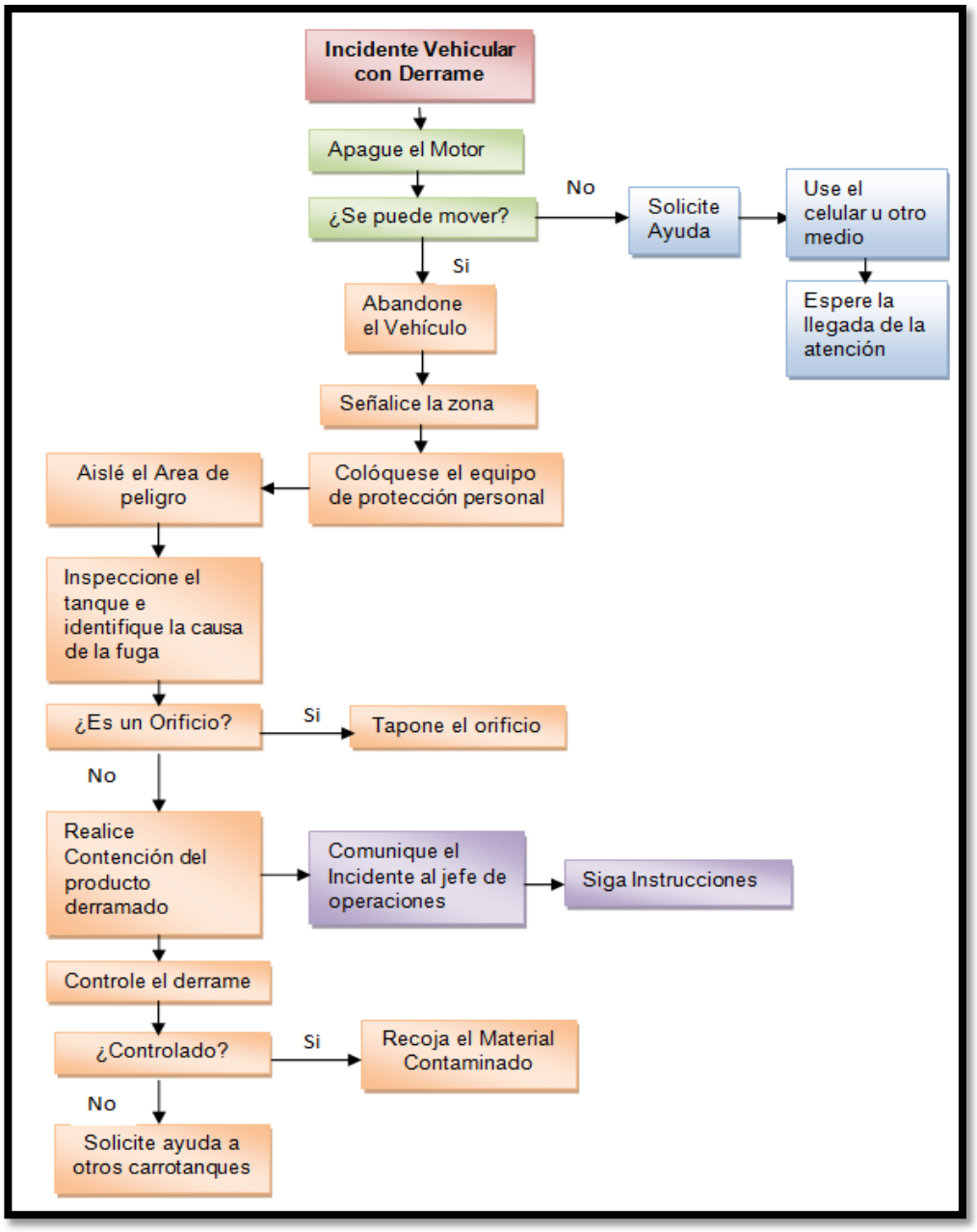
RESOURCES SUPPLIES AND SERVICES

It is recommended to have available the following to address spills:

- Personal protective equipment (goggles, masks, special boots)
- empty containers
- labelstock for labeling containers
- absorbent material depends on the chemical absorb and treat substance.
- Solutions with detergents
- Brooms, shovels anti sparks, funnels, etc.

All emergency and safety equipment must be constantly reviewed and kept in a form suitable for eventual use. Personal protective equipment must be decontaminated and should be cleaned after use. Liquid spills should be absorbed with an absorbent suitable solid supports spilled substance. The area must be decontaminated according to the instructions given by trained personnel, and waste must be disposed according to the instructions given in the MSDS.

Figure 11.1.3. 6: Action Plan spill fuel or chemicals in road accidents



Source Gemini Consulting SAS, 2016

The activities that make up a plan for emergency response for spills of chemicals or fuels are:

- Contention: After the source identified and spillage, is controlled, in order to prevent the entry of this substance at basins, sewers, I strain or water bodies.
- Collection: Containing the spilled substance, this is collected and stored temporarily in tanker trucks, temporary storage tanks, or other containers.
- Transportation: You should check the authorized disposal site for the substance collected contaminated material as used in emergency care, in order to be transported and properly disposed both
- Restore: You must ensure environmental monitoring, cleaning polluted and affected area, environmental restoration of the area, in order to give close attention to the emergency. Evaluating the incident and management measures.

- *Action Plan for public risk (Armada, riot or attack site)*

Because of the history of the presence of armed groups outside the law in the area, they are designed action plans for social risks which may arise in the development of project activities. Prevention, management and control of kidnappings and sabotage are shown in Table 11.1.3.23

- Keep calm.
- Immediately stop what you are doing.
- Take cover in a safe place away from windows.
- Avoid unnecessary movement within the facility if possible keep the lights off.
- Pay helps those who need it.
- Assess the possibilities of leaving for a different place to where the main problem.
- Wait for instructions.
- If ordered to evacuate do so immediately in accordance with the intended plan is given.

IN CASE OF ASSAULT-THEFT

- Keep calm
- Observe the salient features of the assailant as height, age, approximate weight, hair color, eyes, scars and types of weapons

- Do not touch anything in the area of the heist order not to hinder the taking of evidence
- Obey the signs Mugger slowly and calmly
- Do not confront the mugger especially if it is armed

TERRORISM (armed outlaw groups)

BOMB THREAT

- Keep calm
- Listen to the caller.
- Try to keep the conversation as much as you can.
- Try to take the more information you provide the caller.
- Capture significant details such as language and words used, terminology, background noise, stress, sex caller, if possible try to write all the text of the call.
- Try to sign another person to report the emergency
- After hanging up, report the emergency.
- Do not discuss with anyone what happened.
- Wait for instructions.

Presence of objects suspects.

- Keep calm
- Try to rule out the origin of the suspect whose object is, who put it there etc.
- If the suspicion is found, immediately evacuate people in place, should not be used radios, cellular, beeper etc.
- Emergency report or ask someone to do it from elsewhere.
- Isolate the area to not enter anyone and evacuate at least 300 meters from where the package is.
- Go to the meeting place and wait for instructions.

PRESENCE OF PEOPLE SOPECHOSAS.

- Always keep the person under observation without being too obvious.
- Safety report the situation and description of the person.
- In a polite manner approach the person and ask if you can help with anything.
- Stay alert and wait for instructions.

CALL THREAT

- Try to prolong it as long as possible
- If you have recording mechanism, turn it immediately
- If you can establish intercom with alarm room or area of prevention and risks, do it
- Seek information: who called ?, Where ?, calls when will it happen ?, where ?, why he's doing?
- Try to capture significant details: voice, background noise, accents, idioms, interference, repetitive phrases and names
- Avoid hanging until the caller has done
- Give her information only emergency group or authorities

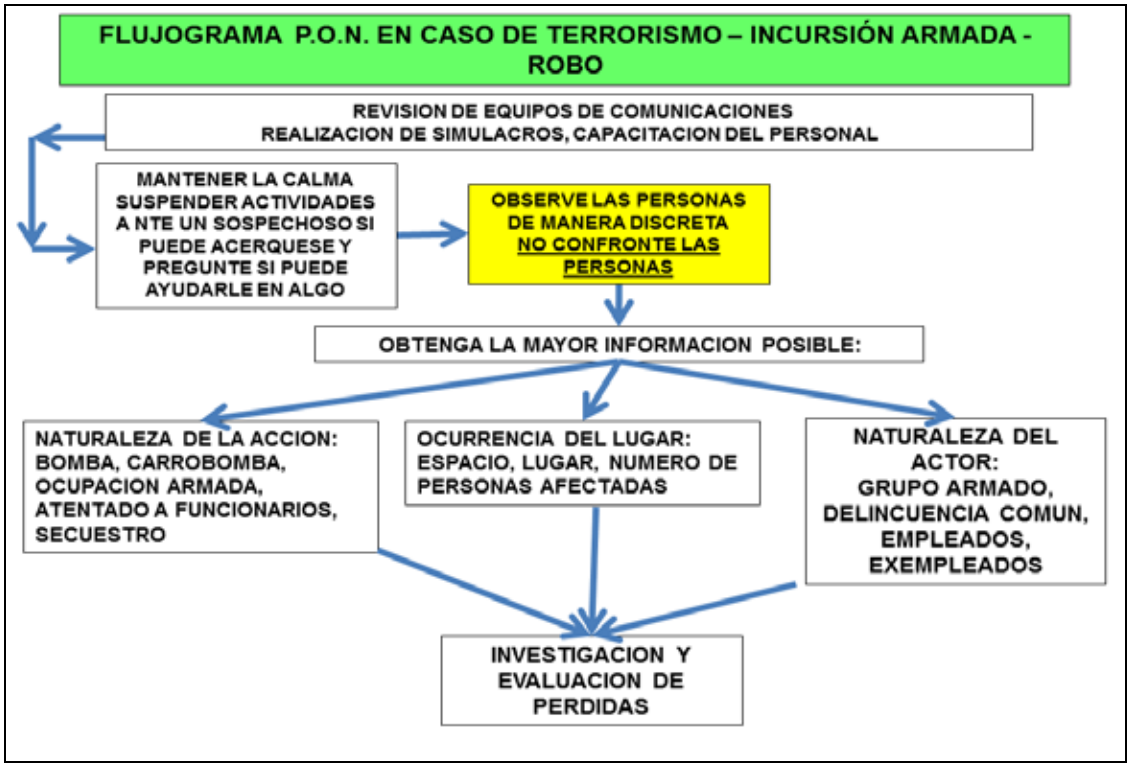


Figure 11.1.3.11PON flow chart in case of terrorism-armed-robbery raid

Source (Gemini Environmental Consultants, 2016)

Table 11.1.3.19: Prevention, management and control for kidnapping and sabotage

KIDNAPPING	SABOTAGE (MECHANIC, ARSON AND EXPLOSIVES)
- Never unaware that the threat of kidnapping or danger exists. - Do not show ostentatious movements or wasteful. - Avoid routine shifts, schedules and activities. - Do not establish trust with staff from the region. - Do not neglect preventive measures. - not without risk. - Do not discuss with anyone the activities to be performed or being carried out in the work area. - Always keep eye on safety procedures have been established. - Always keep in reserve staff phones from family or friends and what type of business activity or dedicated. - When moving to different areas of processes and implementation of activities, notify the responsible security personnel, establish direct communication mechanisms during travel with reliable staff.	- prone to sabotage Continuous monitoring of critical areas or. - Installation of key points appropriate lighting systems. - Restricting access to unauthorized personnel - Strict control of input material, packages and mail. - Intensified special night hours and holidays. - immediate and complete research suspects when presented facts and inform the competent authorities.

Source: Gemini Consultants SAS, 2015

- *Medical Emergency Action Plan*

The procedure for handling medical emergencies defines strategies and response actions in health that apply in the place of an emergency by the operating personnel in order to provide basic life support and health of those affected in case of any eventuality register committing personnel and contractors; This procedure will be established with staff SST, ARL and South Union Road Concessionaire SASBefore starting activities.

It is the duty of the highway concessionaire Southern Union SAS and contractors to make known this medical procedure, conducting exercises for development of attention

injured, and identify the risks for which they may suffer an injury in the development of each activity.

The staff who is in charge of providing medical care should be trained to perform this type of care, otherwise it must refrain from perform it and should seek help immediately.

In the operation and work fronts, you should always have first aid kit and trained personnel to deal with emergencies.

Before

- Prepare emergency brigade.
- Keep a list of emergency phone.
- Keeping the MEDEVAC.

During

- Who detects the person (s): informs the leader of the emergency brigade or Brigadista.
- Patient information requested witnesses or staff area.
- The brigadist assesses the patient's condition to determine if it can provide basic care. or required initial request specialized help.
- If the emergency exits control should be left to specialized groups.
- Avoid panic, trying to control people in this state and away the injured or who are going through the emergency.
- The support team: controls the entire communication system during the contingency. Request ambulance (tam, tab or ICUs).
- If required you will be sent with an escort to the nearest specialized medical center regardless of the type of entity to which it is affiliated.
- The rest of the staff: Attentive and available to support emergency.

STEPS	EVALUATE	SIGNS AND SYMPTOMS	TO DO
EVALUATE AWARENESS	CONSCIOUS	Answer the call or pressing on the chest over the sternum	Ask for help and place in safety position.
	UNCONSCIOUS	unresponsive It does not move	Ask for help Clear airway.
EVALUATE ROUTE AERIAL	BREATHE	chest moves or You feel the air out through nose or mouth	Help, keep safety position.
	NO BREATHING	chest does not move air feels out through nose or mouth.	Administer rescue breathing with the help of safety mask
EVALUATE CIRCULATION	pulseless	chest does not move air feels exiting nose or mouth	Administer rescue breathing with the help of safety mask.
	Pulseless	You feel the throb in the region of the neck or wrist.	Help, keep safe position and monitor the status of consciousness, breathing and pulse until help arrives

Source (Gemini Environmental Consultants, 2016)

- *Damage Care Plan utility networks*

It occurs when part of the activities of excavation and stripping emergencies generated by damage to infrastructure utilities (gas networks, communication, etc.), prevention measures are:

- Keep in flat work record with piping layouts and inform operators of machinery and equipment on the existence of networks.
- constantly inform companies providing utilities with the dates and types of works to be executed.

- Establish immediate communication with the company providing the service and / or owner of the property where the involvement occurs in order to locate and close the valves or controls to stop the flow of service.
- Locate and describe the site of involvement of the service line.
- Identify with the company providing the affected population and estimate the time it will take to repair the damage.
- Proceed to the repair and replacement of the affected line in coordination with the company providing the service and / or owner.
- Restore service, ensuring stability thereon with the lending company.
- Having tank service truck to provide water service to the community while it is restored.
- An assessment of damages or damages caused to surrounding infrastructures in order to take the necessary corrective measures.
- Submit a report of executed works and service restoration.

Measures precautionary emergency

- In case of pipe water piping, pumps evaluate the option to collect spilled product (bilge) to make the corresponding arrangements.
- In case of natural gas pipeline conductive, activate a plan community information to avoid further alterations by increasing the concentration of gases in the atmosphere and possible fires propagation effects thereof.
- Keep the community informed of the situation and the measures taken by the suspension of any public service. This communication will be coordinated through the surrounding community together.

Figure 11.1.3.12 PON flow chart in case of environmental emergency

Source (Gemini Environmental Consultants, 2016)

11.1.3.3 Contingency Management

Are the activation mechanisms in a time when failures occur in the construction process or operation, as a result of an event. It includes the preparation and implementation of the response to the occurrence of emergency and the subsequent recovery of the affected items. See Table 11.1.3.24

functions

· associates in emergency events

The concessionaire Road South Union should have responsibilities implicit in everything that involves coordination with municipal entities in the municipalities of Imués, Tangua, Yacuanquer and Pasto, with government agencies and community relations.

Likewise, the concessionaire is responsible for providing the necessary resources to ensure the safety of human resources, infrastructure and Delos natural resources in the area of influence, also be responsible for providing training and other tools to gain knowledge workers to preserve and preserve environmental conditions.

· Structure Coordinating Committee

Responsible for reviewing and coordinating the actions of the plan, this committee has the following functions:

- Emphasize the implementation of preventive measures in order to avoid any kind of emergency in the work environment.
- Conduct talks with all site personnel in order to indicate the measures of prevention, care and action in the event of a disaster by any cause.
- Coordinate with emergency committee training staff directly involved in the care of contingencies.
- Review procedures for care of contingencies in accordance with the drills carried out
- Compiling all necessary information from both work fronts and the neighboring community to the project in order to know the area and all the circumstances that may arise so that at some point the tools for making decisions are taken.

Coordinating committee has the following committees depend on who is responsible for the direct care of emergencies.
In the event of an emergency, the committee should:

- Define autonomously or in coordination with other project, the need to activate one or more contingency plans.
- Coordinate preventive action, care and restoration that are part of the Risk Management Plan.
- Determine the extent of the area affected and the extent of the damage presented.

· Emergency Operating Committee structure - COE

The COE Emergency Operations Committee is the body responsible for planning and managing the emergency plan. It will consist of people from the administration, who in the emergency plan, are distributed as shown in the chart and its functions are distributed in the before, during and after an emergency, as listed below:

- General functions:

a) Support and strength to the organizational structure of the emergency plan assuming leadership and responsibility of the

b) Avala guidelines, procedures, programs and activities of the emergency plan in phases of planning, training and emergency situations.

c) Exercises control and monitoring of the development and continuation of emergency preparedness program to ensure dissemination and maintenance. Similarly ensures conducting regular drills of the emergency plan involving all levels of the organization.

d) Approves training programs for emergency operating groups (brigade) and the acquisition and maintenance of basic equipment used in emergency management.

e) Ensures the training of each of the people who make up the organizational structure to ensure proper coordination and group cohesion.

f) The Emergency Committee shall appoint a Director of communication and press, who must provide the necessary information on the development of emergency and if necessary will process and deliver information to the public media (press, radio and TV), ensuring the dissemination truthful about the facts and journalistic speculation neutralizing that may affect the image and functioning, impairing operations or emergency control.

g) In situations of non-emergency plans, it promotes and coordinates training programs, training and equipping of emergency generator, according to the needs of the Brigade.

h) Candle fire because the systems are always available and in perfect condition, also determine the level of protection that must be the work (offices, camps and opposite force) in case of fire risk.

- specific functions

  - Define training program
  - Define risk analysis programs
  - Notify insurance companies
  - Coordinate with the support team

- Report management
- Convene the necessary advisers
- Coordinate with support agencies
- Coordinate relations with the authorities
- Keeping the Emergency Plan, and matrix hazard and risk assessment.
- Maintain permanent contact with the Directors of the response areas and evaluate their reports during an emergency.
- Provide the additional support required if the plan is inadequate or try a risk not covered.
- Search timely reaction to an action. This is not a demonstration of power but of determination.
- Involved as protagonist with a state of mind to stimulate corporate values
- Ensure that procedures in accordance with institutional values and standards are met.
- Manage internal and external information, taking care of misinterpretations
- Safeguard the reputation of the company
- Assess the risk of the company in terms: financial, legal and reputational damage
- Allow areas not affected by the crisis maintain their operation
- Protect the business position of the company
- Protect the assets and interests of the company
- Minimize the effects of the aftermath of the crisis
- Eliminate / control the threat.

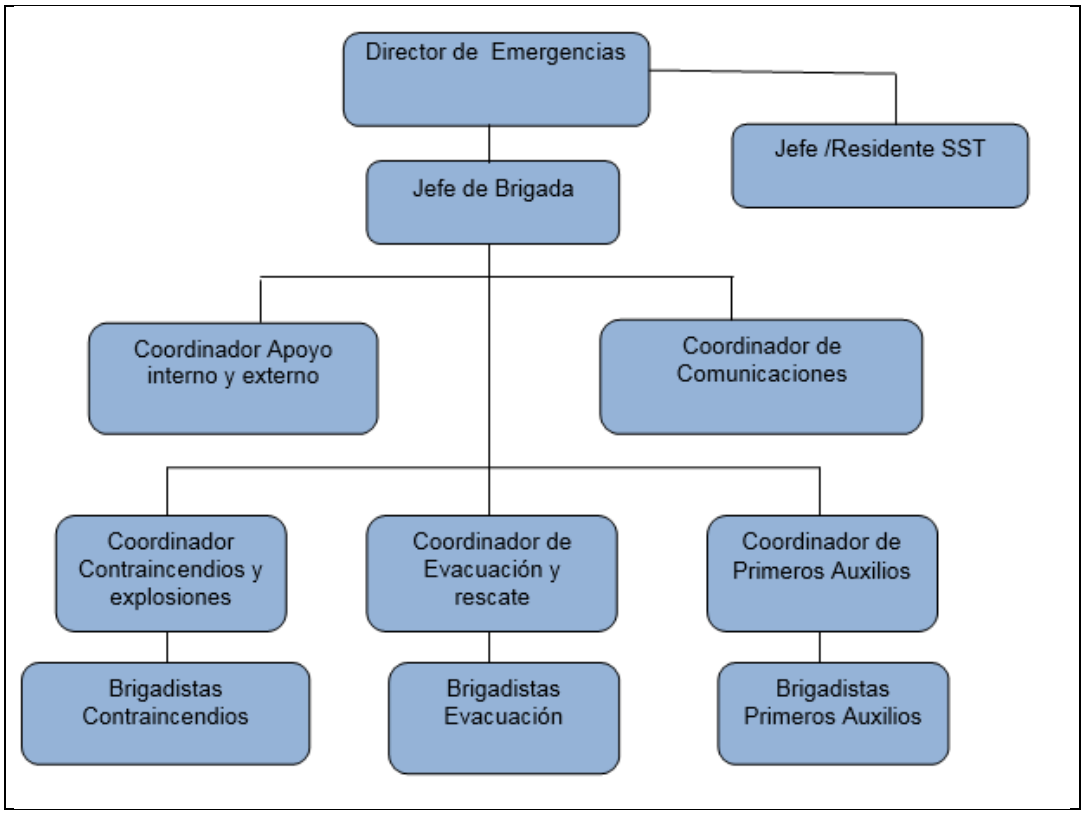


Figure 11.1.3.13 Emergency operating organizational committee
Source (Gemini Environmental Consultants, 2016)

· Functions of emergency manager

He is in charge of taking the management and control of the emergency, it is characterized by the ability to make decisions within the company

Before	§ Have a full knowledge of the emergency plan § Being aware of the behavior of emergency events most likely within the venue. § Facilitate the implementation of the emergency plan. § Oversee the development of the tasks assigned to the committee members § Coordinate and chair meetings of the Emergency Committee.
During	§ It will verify the alarm and implement the emergency plan, according to the nature and magnitude of the event.

	§ Establishes permanent communication with the directors or coordinators of the groups. § It establishes the priorities of the requirements to be made by the operating groups. § Inform the emergency committee decisions are taken to address the emergency.
After	In meeting with other members of the committee will be established: § Give the part of normality and reimbursement activities. § Identification of causes of the loss was generated § Evaluation of the response had to face the emergency § Determination of recovery systems and adaptation of equipment and deteriorated areas § Determine appropriate adjustments Emergency Plan

· Functions of Chief / resident SST

It is in charge of coordinating the group of physical security of the work and the group of internal support (administrative).

Before	§ Periodically inspect the conditions of safety equipment, fire extinguishers and camp office. § Keep updated evacuation routes. § Maintain inventory of physical and human resources that the company will have to deal with emergencies § Perform preventive maintenance to equipment and security systems. § Make contributions of equipment and control elements needed for an emergency. § It will draw up evacuation plans office § Define meeting points. § Coordinate drills § Socialize with all staff established procedures for emergency care
During	§ Provision of additional equipment for operating groups to perform emergency control. § Cordoning off affected areas. § Control traffic flow
After	§ Conduct research into the causes why the event was generated. § Perform inventory of damage, both of the facilities and equipment used in the control of the event. § Carry out procedures for replacement PPE. fire equipment and

	recovery of affected areas. § Coordinate the preparation of interim areas to continue performing tasks that are suspended

· Coordinator functions of internal and external support

He is the person responsible for establishing agreements with relief agencies in the area and government security groups, and coordinating resources within the company.

Before	§ Contact external support groups, determining who is the contact person, resources available, among others. § Determine the reaction times of each group of external support, taking into account its distance from offices and characteristics of the access roads. § Meet the planes of the access roads to the work, to send groups of external support by fax or by any other means ..
During	§ In coordination with the Director of Emergency Brigade Chief and Chief Brigadier establish the needs for external support. § Support the work of evacuation and control staff at its output. § It shall inform external support groups and development characteristics of the emergency, its progress or control at the time of their arrival. § Coordinate with the Chief Brigadier type of statement and its contents. § It shall ensure the image of the company, communicating the actions that have been carried out for emergency control § It will give the order, the person concerned to call external support groups. § It will work in administrative actions emergency control
After	§ Assessment of external groups in response time and control maneuvers § Adjustment and correction procedures § Determine corrective actions involving their functions.

· Communications coordinator functions

Is the person in charge to deploy the call chain in the event of an emergency.

Before	§ Keeping the list of emergency phone, clinics, support agencies, telephone brigade. § Prepare the list Medevac emergency. § Media review brigade in case of emergency. § Set the directory groups internal and external support. § He made the inventory of existing equipment and communication systems § It will ensure the good condition of such systems and equipment.
During	§ Support the work of evacuation and control staff at its output. § It will activate the chain call in case of emergencies, initially brigadiers, support groups, ambulances, clinics, family if required. § Coordinate with the Chief Brigadier type of statement and its contents. § It shall ensure the image of the company, communicating the actions that have been carried out for emergency control § It will work in administrative actions emergency control
After	§ Assessment of external groups in response time and control maneuvers § Adjustment and correction procedures § Assess efficiency calls and reaction support groups. § Maintain communication with medical entities to which patients were referred. § Determine corrective actions involving their functions.

· Functions brigade commander

He is in charge of activating and maintaining the emergency brigade, will be available 24 hours a day.

Before	§ You must be trained on fire, evacuations, Rescue, Crisis Management and other activities deemed necessary for the proper handling of an emergency. § It will be fully identified with the work to be developed in an emergency. § It will plan and coordinate educational and preventive actions to prevent and control emergencies § It will schedule regular and special meetings, training, drills and other

	activities for the good performance of the brigade. § It is responsible for motivating and coordinating brigade training of operating personnel of the brigade
During	§ It will take care of the emergency case § It is the person receiving the emergency call and inform the Director of Emergency event is starting. § It classified the emergency and notifies the emergency manager. § In order of priority evaluates and establishes the requirements. Evacuation Intervention of the different operating groups external support § Coordinate with external support groups these functions and emergency brigade. § Will be attentive to any actions outside support groups perform. § Constantly inform the Director of Emergencies of the work that is in progress and needs to be generated.
After	§ Determine corrective within the Emergency Brigade and internal support groups actions. § In partnership with the director of internal support and security, conduct an inventory of the resources used and the state have been for early replacement. § It will prepare a report of the activities developed during the emergency.

· Fire brigade coordinator and explosions

He is in charge of activating and maintaining the emergency brigade, will be available 24 hours a day.

Before	§ You must be trained on fire § Define the organizational structure fire group. § operationally manage the human resource of the fire brigade. § Establish a chain of command to act in the absence of the head. § actively participate in the activities of the emergency brigade of the company. § issued periodically reports the status of the fire brigade. § Maintain training records of the brigade.
During	§ It will take care of emergency in case of incipient fire or fire. § It is the person receiving the emergency call and communicate brigade commander.

	§ Assesses the state of emergency, in case of an incipient fire for fire implements the PON. § Will be attentive to any actions outside support groups perform. § Constantly inform the Chief Brigadier tasks are being carried out and needs to be generated.
After	§ Evaluate the effectiveness of PON, resulting determine corrective and preventive actions. § In partnership with director and chief security brigade will conduct an inventory of the resources used and the state have been for early replacement. § It will prepare a report of the activities developed during the emergency.

· Coordinating evacuation and rescue brigade

He is in charge of activating and maintaining the emergency brigade, will be available 24 hours a day.

Before	§ You must be trained on evacuation and rescue. § Define the organizational structure evacuation group. § operationally manage the human resource of the evacuation brigade. § Establish a chain of command to act in the absence of the head. § actively participate in the activities of the emergency brigade of the company.
During	§ It will take care of evacuation if the brigade commander of the order. § Assesses the state of emergency and conditions to evacuate, if the conditions are optimal for evacuation begins the implementation of the PON. § Will be attentive to any actions outside support groups perform. § Constantly inform the Chief Brigadier tasks are being carried out and needs to be generated.
After	§ Evaluate the effectiveness of PON, resulting determine corrective and preventive actions. § In partnership with director and chief security brigade will conduct an inventory of the resources used and the state have been for early replacement. § It will prepare a report of the activities developed during the emergency.

· operational support - Emergency Brigade

It is the group of employees trained and trained to prevent and control events that can generate economic and human losses for the Organization. To belong to this group must meet the following requirements:

§ Fitness Service
§ Approval of Human Resources
§ Approval of supervisor
§ satisfactory medical certification

Composed of medical staff work, volunteers from the different fronts of work, coordinated by engineers building residents. The team must have the training and ability to operate the plan immediately when notice is of a contingency.

Before	§ Collaborate with the Emergency Committee, in the work of risk inspection and periodic review of fire protection equipment and first aid. § constantly participate in training on emergency brigade. § Collaborate in the work of employee training. § periodically train emergency procedures
During	§ Provide first aid to victims in the event site. § Rescue people trapped. § Control fires in accordance with the procedures. § Collaborate in the work of salvage and rescue equipment.
After	§ Control and monitor the affected areas until the employees responsible or monitoring group members become present. § Inspect the affected area in order to ensure risk control area. § Restore protections affected area. § Collaborate in the review and maintenance of protective equipment used

· Advisory Committee

The main function of this committee is to advise engineers every front to solve problems occurred by an eventuality, where technical issues have not been resolved,

also advise the steering committee on updating the information needed to meet the contingencies implications techniques.
It is made by specialists in the areas of geotechnical structures, hydrology, environmental and in all that is required.

· Safety Committee

The safety committee will perform the management and coordination of social contingencies that arise on the fronts of work therefore carries out regular assessments of the safety systems of care project to criminal acts.

This committee included staff work and representations of civil and military authorities.

Table 11.1.3.20: Staff functions in Stages Emergency Care

PERSONNEL BY ITS ROLE IN THE PLAN	PREVENTIVE STAGE	STAGE REACTIVA	CORRECTIVE STAGE
strategic	-Provide the necessary resources to implement emergency response plans. Maintain a level of preparation according to the requirements of this document	-Provide additional resources required for emergency care -Command greater emergency and national level	Provide the necessary resources for emergency activities post
Tactical	Evaluate and propose new strategies and control techniques Assess emergency response plans areas Maintain a level of preparation according to the requirements of this procedure	Emergency command greater and grade, middle lower	Assess damage investigate incidents -Defining corrective and preventive actions
operating	-Make the implementation of emergency response plans	-Command emergency lesser extent and means	Participate in the process of damage

PERSONNEL BY ITS ROLE IN THE PLAN	PREVENTIVE STAGE	STAGE REACTIVA	CORRECTIVE STAGE
	-Keep information updated plans Maintain a level of preparation according to the requirements of this procedure	-Respond to emergencies following the command structure established	assessment and incident investigation

Source: Guide for Planning and Emergency Response

The amount of strategic and tatico staff will be required for each area to meet the necessary functions of command and emergency management.

procedures

Following emergency procedures that allow rapid mobilization and implementation of human, material and technical resources to implement immediate response actions are described.

the basic procedures for emergency care in the development of the activities of Project, Which should be welcomed by staff and contractors involved in the operation and development.

the emergency notification mechanisms are defined, the organization of care, and activation of the Risk Management Plan. Actions and being reactive when facing an emergency decisions. It is a guide which shows how clear strategies and practices in order to provide care and emergency response quickly, effectively and appropriately, protecting life and the environment. Attention and response for the operating component recognizes a response to every emergency, these being type: incipient, lower, middle and higher.

· Precautionary measures

Preventive measures are developed after identifying one to several risks, which may materialize and cause an incident or emergency.

The preventive measures seek to minimize the probability of occurrence of an incident and / or their effects on health and the environment, for this reason are considered preventive measures to avoid operational accidents, which are given by the rules and international and national procedures, which make them mandatory at the time of the operation.

· Operating processes

Operating for the management plan project risk, process chain in which care emergency from their actions, evaluation, activation for emergency response, determining the resources required for activation takes place is defined and response action plans for joint actions of the groups that attend the emergency, among other lines of action, in order to give a correct and effective emergency care.

guidelines for the development of monitoring and control of the efficiency and effectiveness of the actions taken in emergency care and control, generating mechanisms and / or enhancement tools for emergency care is also defined.

Improvement mechanisms evaluate every action taken from planning, response and correction of an emergency, these actions will be recorded and a subsequent review will be conducted in order to take measures for improvement. Figure 11.1.3.7 It shows the general operating process for identification, care, and evaluation of actions taken for emergency care

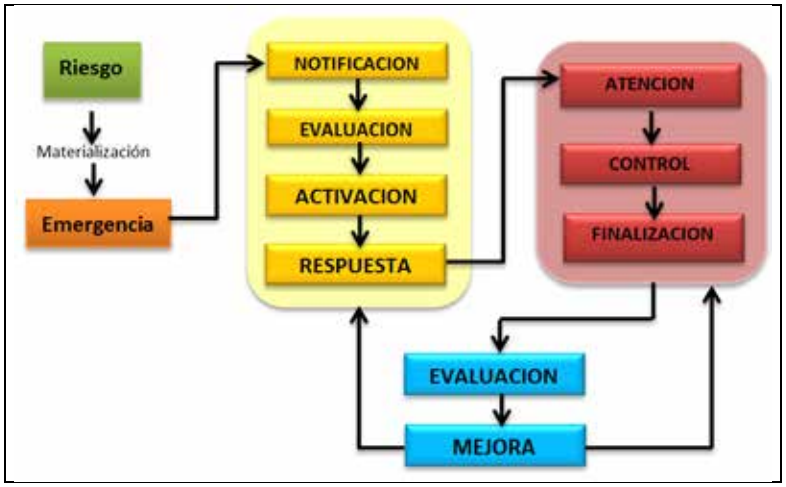


Figure 11.1.3. 7 Operating process for the Identification, Evaluation Care and Emergency
Source Gemini Consulting SAS

The operating process seeks to prevent and minimize damage that may be caused to personnel or third parties and Ambienta medium due to an emergency, for that reason it seeks to optimize the time in the emergency response evaluating the effectiveness of:

- Type of mechanism used for reporting emergencies
- vehicle use and monitoring and control system (if vehicular accident)
- Installing traffic checkpoints
- Installation and provision of emergency care points
- competent staff for emergency care
- Vehicles available for emergency response
- Implementation of mutual aid plans
- Community involvement and operators

For emergency response you have to perform basic at the time of an emergency actions.

· Activation of Risk Management Plan (RMP)

PGR activation designed for the project must be led by the Emergency Operations Committee - COE, which will have to activate all the emergency response team.

This activation provides for the disclosure of management levels, operational leaders, and strategic as appropriate to the level of activation. You must include the report of emergency declaration, which can occur in a post-activation response group, depending on the characteristics of the emergency needs time.

The emergency declaration will indicate the levels of management, regarding the fact occurred may take special measures implementing agile expenses. This includes the allocation of funds for emergencies.

· Operating processes Answers

Defined areas for development Draft, It should take into account the organization of resources for emergency response within this scheme and should consider:

- Input: The point that allows access to the resource area where there has been an incident. You must define a single entry in order to control resources and access to the area.
- Major Area Victim (ACV): This place must be located outside the impact area, where doctors and care for wounded, In cases of fatalities in the country, resources are located may be established in this area a temporary site for hostel deceased occurred in this area.
- Relay stations: They are the points of arrival and departure of orderlies who are among the groups Advanced to the ACV. These points installed when the distance between the groups advanced and stroke is significant and represents an effort at this point auxiliary makers to continue providing first aid and stabilization of the injured were found.
- Output: This is the outflow of funds and personnel from the area of the emergency, establishing a single output, in order to control the flow of resources for this.
- Continuity project must meet the representatives of the Concessionaire Road South Union SAS and contractor companies, in order to achieve emergency management strategies to ensure business continuity.

· Activating the Emergency Response - Activation Risk Management Plan

At the time of an emergency, the CEO must perform activation of the entire team of emergency response, in order to optimize the process brought to the response group on the emergency occurred. This activation represents activation risk management plan.

The bodies of Prevention and Attention to Disasters (PAD) include: Interior department of Narino, Local mayor of the municipalities of Imués, Tangua Yacuanquer and Pasto, Health Department, Fire Brigade, Civil Defense, Red Cross, CORPORANIÑO, CREPAD, National Police , National Army. In addition you communicate due to mutual aid entities established in each municipality.

The emergency declaration should contain in its activation message:

- General and technical characteristics of the event and area of influence
- Emergency grade

· Event Announcement

At presentation an incident or an event that should be communicated to all personnel from affected area. This notice may come from internal staff, contractors, authorities and the community, this in order to inform the staff responsible for activating emergency response. Each area must have a line contact or communication system for receiving such notices, and their availability to serve you must be maximum 24 hours.

The person receiving the notice, taking care of who reports data, date and time of the event, an overview of the event, possible development of the event, presented and potential damage.

The receiver will who is willing to begin the next steps, communicating to stakeholders activating the risk management plan. All work fronts, located in the project area should centralize receiving calls and warnings of possible emergency, by a single receiving channel.

· Event Confirmation

Upon receipt of the notice of emergency, operational or administrative area will be a basic check of the event, it is considered necessary. This is to establish the veracity of information regarding the occurrence of the event and the emergency condition thereof. It must be available to perform this confirmation within 24 hours. This confirmation may coordinate by telephone, if the circumstances of the event permit.

Depending on the area and site verification should define the need to incorporate physical security personnel. In case you need to incorporate these personnel, you will have to tell the representative of the area or failing regional representative.

The product confirmation notice is:

- Confirm the occurrence of the event.
- If the event is related to a hazardous condition that could compromise the integrity of persons, environment and property this must be reported and an incident is considered.
- If the event and poses a threat to the integrity of people, the environment and property, this will be considered an emergency and must follow the process of initial actions, which continues with the evaluation, activation and report the emergency occurred.

If the event is not considered an emergency, they may be required operational measures, physical, industrial, occupational, administrative security, among others, but no risk management plan is activated

Once confirmed, the event must be reported to the information available on the event type, location, conditions, affectations personnel, the environment and property.

· They are representing an emergency events

The event is considered an emergency, when there is involvement of people, the environment and / or property, having any of these scenarios should be initiated and alarm notification procedure, initial emergency assessment and control actions.

· Notification and Alarm

Once it confirmed the event and that this has been categorized as an emergency, you must complete the notification, which must be done in order to report the emergency situation to people, staff and contractors, which are located in the area directly affected by the event, must take security measures to prevent or mitigate the effects of damage on them.

The emergency plan establishes the general procedures of personnel action that can directly be compromised. Given these procedures and conditions of each situation, the COE will define the security measures to be adopted, information must be provided to staff through evacuation coordinators and support facilities reporting system and alarm.

One measure of assurance personnel, which is within the area of influence, is its shift to a lower-risk area. In order to ensure this, evacuation routes must be designed for installations in the area, as well as access roads to emergency equipment. Among the plans for each of the fronts of work, camps, administrative areas and associated infrastructure should be designed and implemented actions of search and rescue, because in the area of project development groups it is evident outside the law creating a social risk.

Within work areas, it is the responsibility of contractors and staff to keep permanent records of staff who is working in their area, in order to maintain effective control in evacuation procedures and medical care. This personnel record must include the following information:

- Full name of staff (operating, contractor, visitor, conveyor, etc.)
- Company name to which it belongs
- Name of the health promoter (EPS)
- Name occupational risk manager (ARL)
- blood type and RH factor
- Allergy information
- Person and telephone emergency

Each facility must have a system of registration of workers and visitors through which you can quickly account for the existence and distribution of staff within the premises as verification and control actions evacuation, in order to confront the total staff evacuated to the number of records.
The health care procedure, should be led by the emergency services, rescue workers and medical personnel, this will depend on the needs and possibilities for each area.

· Evacuation process

Evacuation is the set of activities and procedures aimed at preserving life and physical integrity of persons in the event of being threatened, by moving to, from, through and to lower-risk. For the project two types of evacuation are defined, which will be defined depending on the magnitude of the emergency, these evacuations are:

- Total evacuation: All personnel should be evacuated immediately and secure facilities work
- Only certain personnel will be evacuated from the premises in an organized and: Partial Evacuation

The Table 11.1.3. 24 It shows the criteria to begin evacuation procedures, partial or total.

Table 11.1.3.21: Criteria for initiating evacuation processes

TYPE OF EVACUATION		CRITERIA
Partial	**Total**	
X	X	**1.** Duration of the emergency · T <12 hours · T> 12 hours
X	X	**2.** Process units involved · Camps and process areas · Storage tanks · Fire protection systems · Control rooms
X	X	**3.** committed resources · Elements to fight the accident exceed its magnitude · When resources to combat the accident are insufficient
	X	**4.** kind of product · Products that generate a polluting cloud or potentially explosive atmospheres
X	X	**5.** Level of destruction · Min. workplaces or habitation sites are not affected · Partial. Between 20-70% of infrastructure associated with the project affected · Total. More than 70% of the infrastructure associated with the project affected

Source Gemini Consulting SAS, 2015

The following Figure 11.1.3.8 shows the procedure for evacuation in case of an emergency

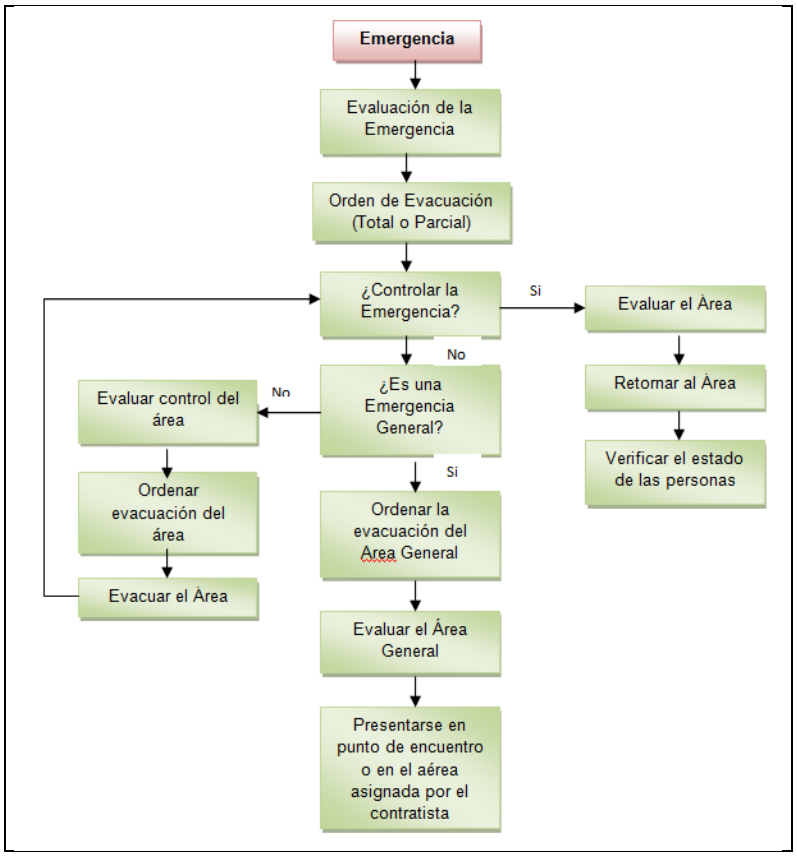


Figure 11.1.3. 8Process for evacuation
Source Gemini consultants SAS

Preparation for the development of evacuation must take into account:

- Detection: Personnel observe or identify an anomalous situation (from monitoring systems or by direct observation), you must notify urgently:
  - Notify the Area Manager.
  - Use the emergency phone

- Alert: The alert status will be declared by the CEO and will be reported to the areas that need to be evacuated.

All staff who is involved in the project, you must know the general guidelines of the evacuation plan, for which the necessary measures will be taken so that this information reaches permanent and new entrants.
Noticing the alarm every sector coordinator immediately ordered the evacuation as previously determined. In these cases there is a series of recommendations to consider, such as:

- Keep valuables and documents and disconnect electrical appliances in charge.
- Then, following indications Manager area, proceed to leave the place to the rules for these cases.
- Offices, administrative areas and plants are evacuated quickly and orderly.
- All outputs must be free of obstacles and under appropriate conditions.
- Keep Calm, one of the fundamental points at all times is to stay calm when we know what we must do, we transmit and security.
- Respiratory protection: when there is the presence of smoke, it is important to protect the airways placing a handkerchief or cloth over your mouth and nose, if possible moistened.
- Not re-enter the area once it has been evacuated.
- The evacuation of sick, injured or disabled persons, should be planned in advance to ensure their safety. It should maintain a permanent record and date of persons prohibited for the purpose of establishing an emergency role for them.
- Ask employees nearby to help anyone ill or suffers injury during an evacuation.
- Once outside the area meet in a safe place with other people (meeting).
- Each group moves to the security area must remain there while verified that the entire group complete evacuation.
- Authorization for staff to return to the building, gives the responsible authority by a return signal previously established.

· Emergency Operations Control

Any response made to an incident or emergency, establishes monitoring, why all the activities must be recorded in different formats, which should be properly archived and systemized. Additionally, in this particular case, you must perform the emergency report to the competent authorities and likewise within the company and project
During the development of the emergency as part of the action plan should be specified at all times: the goal, the exact location of the event that causes and environmental and social characteristics of the area covered by it, the development of the emergency, including others. also they are taken permanent data about the prevailing weather conditions in the area. Based on this information you should make appropriate

adjustments to the initial objectives of the action plan made about the behavior of the emergency.

It must be set if the possible risk persists area affected and the need to alert local authorities

The COE should make continuous assessments of the effectiveness of management actions and advanced control. Based on these assessments will be adjusted action plans in order to achieve greater effectiveness and efficiency in operations

Monitoring and evaluation of operations carried out through the formats established by the company to control emergencies and contingencies. These formats are present before starting operation, any of the formats should be designed for the development of the operation is shown in Table 11.1.3.26

Table 11.1.3.22: Formats monitoring and periodic evaluation of emergency

FORMATS	OBJECTIVE	SCOPE
Incident Summary	Translate the summary of the incident	- Identification of the structure - Map or sketch of the scene - Decisions - Orders - Instructions given -Communications registered -General remarks
Incident Action Plan	Establish the incident action plan	- Specific objectives of the operational period - Strategies - Means - Assignments - Organization for attention
Tactics assignments	Organize tactical assignments	- tactical assignments - Staff Responsibilities
Distribution Channels and Frequencies	Plasmar distribution channels and	- Channels - Frequencies

FORMATS	OBJECTIVE	SCOPE
	frequencies in the incident	
Medical plan	Establish Medical Plan	- existing and available stations for medical assistance in the area of the incident - Transportation of patients - transfer of patients to medical facilities
Registration and Control of Resources	Register and control resources	- Request resources - Time of arrival - Statement of Resources - Responsible
Activity Log	Chronologically organize events that happen during an emergency care	- Personnel assigned - Activities

Source Gemini Consulting SAS, 2015

The accounting expense ratio mitigation and emergency care and primary cleaning should be carried separately from the expenses for decontamination and remediation actions. Care expenses to be considered correspond to:

- Personal expenses.
- Transportation expenses.
- Fuel costs.
- Food and lodging expenses.
- Expenses for chemical inputs.
- Equipment rental costs.
- Consumables costs.
- Expenses biodegradation of contaminated soil and plant material.

All costs must be duly authenticated receipts and invoices, as these support the report for charging policies to insurance companies.

· Completion of Emergency

After the emergency, the COE will develop a series of activities in order to determine the time of decommissioning operations (operational closure), assess the consequences of emergency concerning the efficiency of mitigation processes and effects on the environment both by the emergency itself as response efforts developed on the occasion of this and finally know and assess the damage and elements used, to thereby establish responsible for replacements and repairs that might arise.

It is important to consider the environmental management of the waste generated in the contingency or during recovery efforts, considering the actions proposed in the Environmental Management Plan of this study, in relation to the management of domestic solid waste, hazardous waste and special .

The main recovery actions to be carried out in the area of the incident, once the emergency are:

- Removal of Equipment and Elements

After the emergency attention to the removal of materials, equipment and items that have been damaged fully or partially by the same, thereby seeking it is necessary:

- Save those who have not suffered consequences, or having got suffered, they can recover partially or completely
- Decrease the latent risk caused by instabilities and disorder affected area.
- Facilitate qualitative and quantitative assessment of losses.
- Facilitate the adaptation of the affected areas and the resumption of activities in it.

Debris removal must take into account the following considerations:

- It should be done as sufficiently careful to avoid injury or additional damage to equipment and facilities and not to destroy evidence needed for the investigation
- It must be performed in response to a method involving procedures and equipment.

To effect removal of debris shall proceed in the manner discussed below.

- Do not start work until you have the consent of the authorities and the Underwriting Agencies.

- Inspect the area trying to classify and quantify the extent of activities such as demolition of structures, repair materials, equipment and facilities, disposal of debris and waste, and collection and reconditioning areas.
- Determine the need for human and technical resources necessary to implement the planned activities and provide them with the necessary personal protective equipment such as boots, gloves, helmets and respiratory protection if necessary.
- Plan the runtime of the planned work.
- In administrative and camp areas, ensure that water services, energy and gas, are suspended in the area, and only allows lighting.
- If risks to stability are imminent, first perform demolition work.
- Sort and select the areas and the status of the items found.
- Select a site for waste, which is close enough to reduce transportation costs; that is of sufficient capacity, permitted use and offers no risk to the community.
- Evaluate the time provided for measures with internal resources, against the cost of hiring them externally.
- Do not make negotiations of any kind with materials and / or equipment whose loss is compensable by the insurance company.
- Make a list of damaged items and state thereof.

· Incident Investigation

The research activities are developed in order to identify and assess the root causes of the accident and development and establish responsibilities. Research should include:

- Information about the accident: name and identification of the victim (if any), date and time of the accident, the accident site (village, municipality, department), identifying the contractor, transport route (identification way), activity performed when it occurred accident.
- Detailed description of the activities carried out before the accident.
- medical diagnosis of the injured.
- Accident statistics: analysis and classification of all incidents
- Accident assessment (risk assessment).
- documentary collection: photographs, interviews, inspection of the accident site, documents (roadmap, policies, emergency card), among others.
- Root cause analysis: identifying immediate causes, root causes and system failures.
- Establish corrective and preventive actions.
- Dissemination of lessons learned and lessons learned.

· Final report of the Emergency

The final report should be submitted within a period not to exceed twenty (20) days from the completion of emergency care and shall contain at least the following aspects:

- Date and time of the event and date and time of the initial notification made.
- Date and time of completion of the emergency.
- Location of the emergency.
- Origin of emergency.
- Cause of emergency.
- Scale of the emergency.
- Determination of affected areas (land, natural resources, facilities).
- Determination of affected communities.
- Action plan developed and response times
- Description of prevention, mitigation, correction, monitoring and restoration adopted.
- necessary support (requested / obtained).
- Reports made to other government entities.
- Decontamination costs (containment, collection, storage, retrieval and / or cleaning).

· Evaluation and improvement of PGR

After completion of the emergency and based on the daily reports of operations or activities, a detailed assessment of the effectiveness of the Risk Management Plan will be made, with reference to emergency care.

The evaluation will determine the most important to consider the reformulation and redesign of the PGR, based on the experience gained following the emergence aspects.

Evaluation activities will include workshops involving all persons involved in handling the emergency, in order to analyze the results and establish the "lessons learned".

Based on the level of success in controlling the emergence and lessons learned, should make an assessment of the effectiveness of the RMP. The evaluation will determine the most important aspects to consider for the reformulation and redesign of the Risk Management Plan To carry out this evaluation the following aspects are analyzed:

- Response levels of the company.
- Analysis of operational risks.
- Roles and responsibilities within the organization.
- Channels of information to the community.

- Equipment for emergency control.
- Communications systems.
- Training and simulation program.
- Structuring the Information Technology Plan. Existence of plates, maps, plans. Critical information, inventory control equipment, list of authorities, among other areas.

The lessons learned should be disseminated all persons responsible for the management and control of emergencies in different areas, contractors and Emergency Care, among others.

Information system

Alerts are measures of forecasting and preparedness related to two aspects: the previous information that exists about the evolution of a phenomenon, and the actions and measures to be taken by the Committees for the Prevention and Attention to Disasters to address the situation It is expected.

Direct responsibility to declare the different levels of alert rests with the Local and Regional Committees, depending on the scope of the situation, based on technical information provided by a competent institution, for that matter, by theInstitute of Hydrology, Meteorology and Environmental Studies-IDEAMAnd the local behavior, which is subject to the conditions and the level of protection, and local mitigation. This implies the need for preparation for emergency care by the Committees, among others, alarm mechanisms, information, evacuation, temporary shelter, basic items as well as financial resources, as provided by Law 919 of Decree 1989.

Yellow alert

Actions involving the declaration of the yellow alert are: Convene the Committee for the Prevention and Attention of Disasters. Locate critical points and define monitoring mechanisms, high alert and evacuation, based on census and risk maps. Make an inventory of human, technical, economic, equipment, facilities and emergency supplies.

Orange alert

Actions involving the declaration of orange alert are: Prepare for possible evacuation operations. Inform the community about the warning systems in case of emergency. Set enlistment of equipment and personnel. Coordinating temporary housing. Review emergency plans, including health activities, transportation, debris removal, road suitability.

Red alert

Actions involving the declaration of the red alert are: Activate preset alarms. Evacuate and ensure the affected population. Mobilize operating as emergency plans. Meet the basic needs affected population.
Finally the Directorate General for Disaster Attention and Prevention reiterates the importance of them there are close relations of coordination, interaction and permanent communication on measures taken and registered emergency situations, among different instances.

Given the possible effects it is important for an event that may be present:

- Loss of information: To do this, make a backup of the periodic systematization of information and field work digitizing information. This information can be preserved in a cloud or on hard drives where confidential information and their conservation is guaranteed.
- To failures or cellular telephone service must be maintained radio communication phone.
- Keep battery operated radio to keep informed.
- Have the phone numbers of emergency and updated in visible places.
- Keep screens with information.
- He sent emails to entities

After	In meeting with other members of the committee will be established: § Give the part of normality and reimbursement activities. § Identification of causes of the loss was generated § Evaluation of the response had to face the emergency § Determination of recovery systems and adaptation of equipment and deteriorated areas § Determine appropriate adjustments Emergency Plan

· Functions of Chief / resident SST

It is in charge of coordinating the group of physical security of the work and the group of internal support (administrative).

Before	§ Periodically inspect the conditions of safety equipment, fire extinguishers and camp office. § Keep updated evacuation routes. § Maintain inventory of physical and human resources that the

	company will have to deal with emergencies § Perform preventive maintenance to equipment and security systems. § Make contributions of equipment and control elements needed for an emergency. § It will draw up evacuation plans office § Define meeting points. § Coordinate drills § Socialize with all staff established procedures for emergency care
During	§ Provision of additional equipment for operating groups to perform emergency control. § Cordoning off affected areas. § Control traffic flow
After	§ Conduct research into the causes why the event was generated. § Perform inventory of damage, both of the facilities and equipment used in the control of the event. § Carry out procedures for replacement PPE. fire equipment and recovery of affected areas. § Coordinate the preparation of interim areas to continue performing tasks that are suspended

· Coordinator functions of internal and external support

He is the person responsible for establishing agreements with relief agencies in the area and government security groups, and coordinating resources within the company.

Before	§ Contact external support groups, determining who is the contact person, resources available, among others. § Determine the reaction times of each group of external support, taking into account its distance from offices and characteristics of the access roads. § Meet the planes of the access roads to the work, to send groups of external support by fax or by any other means ..
During	§ In coordination with the Director of Emergency Brigade Chief and Chief Brigadier establish the needs for external support. § Support the work of evacuation and control staff at its output. § It shall inform external support groups and development characteristics of the emergency, its progress or control at the time of their arrival.

	§ Coordinate with the Chief Brigadier type of statement and its contents. § It shall ensure the image of the company, communicating the actions that have been carried out for emergency control § It will give the order, the person concerned to call external support groups. § It will work in administrative actions emergency control
After	§ Assessment of external groups in response time and control maneuvers § Adjustment and correction procedures § Determine corrective actions involving their functions.

· Communications coordinator functions

Is the person in charge to deploy the call chain in the event of an emergency.

Before	§ Keeping the list of emergency phone, clinics, support agencies, telephone brigade. § Prepare the list Medevac emergency. § Media review brigade in case of emergency. § Set the directory groups internal and external support. § He made the inventory of existing equipment and communication systems § It will ensure the good condition of such systems and equipment.
During	§ Support the work of evacuation and control staff at its output. § It will activate the chain call in case of emergencies, initially brigadiers, support groups, ambulances, clinics, family if required. § Coordinate with the Chief Brigadier type of statement and its contents. § It shall ensure the image of the company, communicating the actions that have been carried out for emergency control § It will work in administrative actions emergency control
After	§ Assessment of external groups in response time and control maneuvers § Adjustment and correction procedures § Assess efficiency calls and reaction support groups. § Maintain communication with medical entities to which patients were referred.

	§ Determine corrective actions involving their functions.

· Functions brigade commander

He is in charge of activating and maintaining the emergency brigade, will be available 24 hours a day.

Before	§ You must be trained on fire, evacuations, Rescue, Crisis Management and other activities deemed necessary for the proper handling of an emergency. § It will be fully identified with the work to be developed in an emergency. § It will plan and coordinate educational and preventive actions to prevent and control emergencies § It will schedule regular and special meetings, training, drills and other activities for the good performance of the brigade. § It is responsible for motivating and coordinating brigade training of operating personnel of the brigade
During	§ It will take care of the emergency case § It is the person receiving the emergency call and inform the Director of Emergency event is starting. § It classified the emergency and notifies the emergency manager. § In order of priority evaluates and establishes the requirements. Evacuation Intervention of the different operating groups external support § Coordinate with external support groups these functions and emergency brigade. § Will be attentive to any actions outside support groups perform. § Constantly inform the Director of Emergencies of the work that is in progress and needs to be generated.
After	§ Determine corrective within the Emergency Brigade and internal support groups actions. § In partnership with the director of internal support and security, conduct an inventory of the resources used and the state have been for early replacement. § It will prepare a report of the activities developed during the emergency.

· Fire brigade coordinator and explosions

He is in charge of activating and maintaining the emergency brigade, will be available 24 hours a day.

Before	§ You must be trained on fire § Define the organizational structure fire group. § operationally manage the human resource of the fire brigade. § Establish a chain of command to act in the absence of the head. § actively participate in the activities of the emergency brigade of the company. § issued periodically reports the status of the fire brigade. § Maintain training records of the brigade.
During	§ It will take care of emergency in case of incipient fire or fire. § It is the person receiving the emergency call and communicate brigade commander. § Assesses the state of emergency, in case of an incipient fire for fire implements the PON. § Will be attentive to any actions outside support groups perform. § Constantly inform the Chief Brigadier tasks are being carried out and needs to be generated.
After	§ Evaluate the effectiveness of PON, resulting determine corrective and preventive actions. § In partnership with director and chief security brigade will conduct an inventory of the resources used and the state have been for early replacement. § It will prepare a report of the activities developed during the emergency.

· Coordinating evacuation and rescue brigade

He is in charge of activating and maintaining the emergency brigade, will be available 24 hours a day.

Before	§ You must be trained on evacuation and rescue. § Define the organizational structure evacuation group. § operationally manage the human resource of the evacuation brigade. § Establish a chain of command to act in the absence of the head.

	§ actively participate in the activities of the emergency brigade of the company.
During	§ It will take care of evacuation if the brigade commander of the order. § Assesses the state of emergency and conditions to evacuate, if the conditions are optimal for evacuation begins the implementation of the PON. § Will be attentive to any actions outside support groups perform. § Constantly inform the Chief Brigadier tasks are being carried out and needs to be generated.
After	§ Evaluate the effectiveness of PON, resulting determine corrective and preventive actions. § In partnership with director and chief security brigade will conduct an inventory of the resources used and the state have been for early replacement. § It will prepare a report of the activities developed during the emergency.

· operational support - Emergency Brigade

It is the group of employees trained and trained to prevent and control events that can generate economic and human losses for the Organization. To belong to this group must meet the following requirements:

§ Fitness Service
§ Approval of Human Resources
§ Approval of supervisor
§ satisfactory medical certification

Composed of medical staff work, volunteers from the different fronts of work, coordinated by engineers building residents. The team must have the training and ability to operate the plan immediately when notice is of a contingency.

Before	§ Collaborate with the Emergency Committee, in the work of risk inspection and periodic review of fire protection equipment and first aid. § constantly participate in training on emergency brigade. § Collaborate in the work of employee training.

	§ periodically train emergency procedures
During	§ Provide first aid to victims in the event site. § Rescue people trapped. § Control fires in accordance with the procedures. § Collaborate in the work of salvage and rescue equipment.
After	§ Control and monitor the affected areas until the employees responsible or monitoring group members become present. § Inspect the affected area in order to ensure risk control area. § Restore protections affected area. § Collaborate in the review and maintenance of protective equipment used

· Advisory Committee

The main function of this committee is to advise engineers every front to solve problems occurred by an eventuality, where technical issues have not been resolved, also advise the steering committee on updating the information needed to meet the contingencies implications techniques.
It is made by specialists in the areas of geotechnical structures, hydrology, environmental and in all that is required.

· Safety Committee

The safety committee will perform the management and coordination of social contingencies that arise on the fronts of work therefore carries out regular assessments of the safety systems of care project to criminal acts.

This committee included staff work and representations of civil and military authorities.

Table 11.1.3.23: Staff functions in Stages Emergency Care

PERSONNEL BY ITS ROLE IN THE PLAN	PREVENTIVE STAGE	STAGE REACTIVA	CORRECTIVE STAGE
strategic	-Provide the necessary resources to implement emergency response plans.	-Provide additional resources required for emergency care	Provide the necessary resources for

PERSONNEL BY ITS ROLE IN THE PLAN	PREVENTIVE STAGE	STAGE REACTIVA	CORRECTIVE STAGE
	Maintain a level of preparation according to the requirements of this document	-Command greater emergency and national level	emergency activities post
Tactical	Evaluate and propose new strategies and control techniques Assess emergency response plans areas Maintain a level of preparation according to the requirements of this procedure	Emergency command greater and grade, middle lower	Assess damage investigate incidents -Defining corrective and preventive actions
operating	-Make the implementation of emergency response plans -Keep information updated plans Maintain a level of preparation according to the requirements of this procedure	-Command emergency lesser extent and means -Respond to emergencies following the command structure established	Participate in the process of damage assessment and incident investigation

Source: Guide for Planning and Emergency Response

The amount of strategic and tatico staff will be required for each area to meet the necessary functions of command and emergency management.

procedures

Following emergency procedures that allow rapid mobilization and implementation of human, material and technical resources to implement immediate response actions are described.

the basic procedures for emergency care in the development of the activities of Project, Which should be welcomed by staff and contractors involved in the operation and development.

the emergency notification mechanisms are defined, the organization of care, and activation of the Risk Management Plan. Actions and being reactive when facing an emergency decisions. It is a guide which shows how clear strategies and practices in order to provide care and emergency response quickly, effectively and appropriately, protecting life and the environment. Attention and response for the operating component recognizes a response to every emergency, these being type: incipient, lower, middle and higher.

· Precautionary measures

Preventive measures are developed after identifying one to several risks, which may materialize and cause an incident or emergency.
The preventive measures seek to minimize the probability of occurrence of an incident and / or their effects on health and the environment, for this reason are considered preventive measures to avoid operational accidents, which are given by the rules and international and national procedures, which make them mandatory at the time of the operation.

· Operating processes

Operating for the management plan project risk, process chain in which care emergency from their actions, evaluation, activation for emergency response, determining the resources required for activation takes place is defined and response action plans for joint actions of the groups that attend the emergency, among other lines of action, in order to give a correct and effective emergency care.

guidelines for the development of monitoring and control of the efficiency and effectiveness of the actions taken in emergency care and control, generating mechanisms and / or enhancement tools for emergency care is also defined.

Improvement mechanisms evaluate every action taken from planning, response and correction of an emergency, these actions will be recorded and a subsequent review will be conducted in order to take measures for improvement. Figure 11.1.3.7 It shows the general operating process for identification, care, and evaluation of actions taken for emergency care

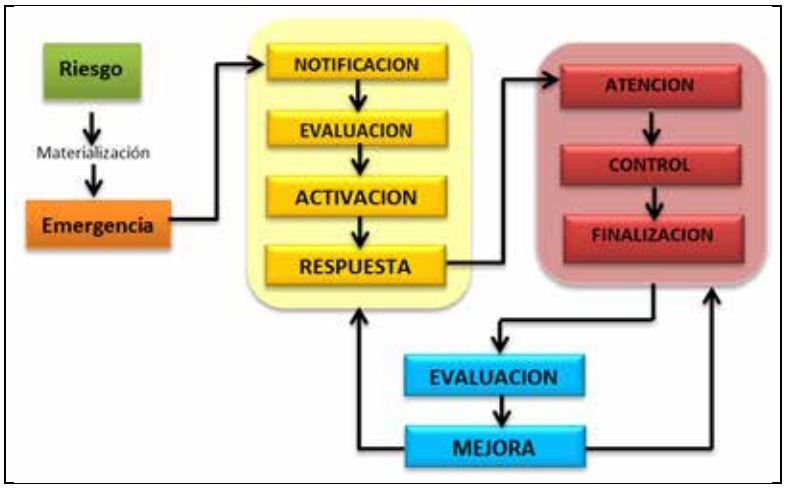


Figure 11.1.3. 9 Operating process for the Identification, Evaluation Care and Emergency

Source Gemini Consulting SAS

The operating process seeks to prevent and minimize damage that may be caused to personnel or third parties and Ambienta medium due to an emergency, for that reason it seeks to optimize the time in the emergency response evaluating the effectiveness of:

- Type of mechanism used for reporting emergencies
- vehicle use and monitoring and control system (if vehicular accident)
- Installing traffic checkpoints
- Installation and provision of emergency care points
- competent staff for emergency care
- Vehicles available for emergency response
- Implementation of mutual aid plans
- Community involvement and operators

For emergency response you have to perform basic at the time of an emergency actions.

· Activation of Risk Management Plan (RMP)

PGR activation designed for the project must be led by the Emergency Operations Committee - COE, which will have to activate all the emergency response team.

This activation provides for the disclosure of management levels, operational leaders, and strategic as appropriate to the level of activation. You must include the report of emergency declaration, which can occur in a post-activation response group, depending on the characteristics of the emergency needs time.

The emergency declaration will indicate the levels of management, regarding the fact occurred may take special measures implementing agile expenses. This includes the allocation of funds for emergencies.

· Operating processes Answers

Defined areas for development Draft, It should take into account the organization of resources for emergency response within this scheme and should consider:

- Input: The point that allows access to the resource area where there has been an incident. You must define a single entry in order to control resources and access to the area.
- Major Area Victim (ACV): This place must be located outside the impact area, where doctors and care for wounded, In cases of fatalities in the country, resources are located may be established in this area a temporary site for hostel deceased occurred in this area.
- Relay stations: They are the points of arrival and departure of orderlies who are among the groups Advanced to the ACV. These points installed when the distance between the groups advanced and stroke is significant and represents an effort at this point auxiliary makers to continue providing first aid and stabilization of the injured were found.
- Output: This is the outflow of funds and personnel from the area of the emergency, establishing a single output, in order to control the flow of resources for this.
- Continuity project must meet the representatives of the Concessionaire Road South Union SAS and contractor companies, in order to achieve emergency management strategies to ensure business continuity.

· Activating the Emergency Response - Activation Risk Management Plan

At the time of an emergency, the CEO must perform activation of the entire team of emergency response, in order to optimize the process brought to the response group on the emergency occurred. This activation represents activation risk management plan.

The bodies of Prevention and Attention to Disasters (PAD) include: Interior department of Narino, Local mayor of the municipalities of Imués, Tangua Yacuanquer and Pasto, Health Department, Fire Brigade, Civil Defense, Red Cross, CORPORANIÑO, CREPAD, National Police , National Army. In addition you communicate due to mutual aid entities established in each municipality.

The emergency declaration should contain in its activation message:

- General and technical characteristics of the event and area of influence
- Emergency grade

· Event Announcement

At presentation an incident or an event that should be communicated to all personnel from affected area. This notice may come from internal staff, contractors, authorities and the community, this in order to inform the staff responsible for activating emergency response. Each area must have a line contact or communication system for receiving such notices, and their availability to serve you must be maximum 24 hours.

The person receiving the notice, taking care of who reports data, date and time of the event, an overview of the event, possible development of the event, presented and potential damage.

The receiver will who is willing to begin the next steps, communicating to stakeholders activating the risk management plan. All work fronts, located in the project area should centralize receiving calls and warnings of possible emergency, by a single receiving channel.

· Event Confirmation

Upon receipt of the notice of emergency, operational or administrative area will be a basic check of the event, it is considered necessary. This is to establish the veracity of information regarding the occurrence of the event and the emergency condition thereof. It must be available to perform this confirmation within 24 hours. This confirmation may coordinate by telephone, if the circumstances of the event permit.

Depending on the area and site verification should define the need to incorporate physical security personnel. In case you need to incorporate these personnel, you will have to tell the representative of the area or failing regional representative.

The product confirmation notice is:

- Confirm the occurrence of the event.
- If the event is related to a hazardous condition that could compromise the integrity of persons, environment and property this must be reported and an incident is considered.
- If the event and poses a threat to the integrity of people, the environment and property, this will be considered an emergency and must follow the process of initial actions, which continues with the evaluation, activation and report the emergency occurred.

If the event is not considered an emergency, they may be required operational measures, physical, industrial, occupational, administrative security, among others, but no risk management plan is activated

Once confirmed, the event must be reported to the information available on the event type, location, conditions, affectations personnel, the environment and property.

· They are representing an emergency events

The event is considered an emergency, when there is involvement of people, the environment and / or property, having any of these scenarios should be initiated and alarm notification procedure, initial emergency assessment and control actions.

· Notification and Alarm

Once it confirmed the event and that this has been categorized as an emergency, you must complete the notification, which must be done in order to report the emergency situation to people, staff and contractors, which are located in the area directly affected by the event, must take security measures to prevent or mitigate the effects of damage on them.

The emergency plan establishes the general procedures of personnel action that can directly be compromised. Given these procedures and conditions of each situation, the COE will define the security measures to be adopted, information must be provided to staff through evacuation coordinators and support facilities reporting system and alarm.

One measure of assurance personnel, which is within the area of influence, is its shift to a lower-risk area. In order to ensure this, evacuation routes must be designed for installations in the area, as well as access roads to emergency equipment. Among the plans for each of the fronts of work, camps, administrative areas and associated infrastructure should be designed and implemented actions of search and rescue, because in the area of project development groups it is evident outside the law creating a social risk.

Within work areas, it is the responsibility of contractors and staff to keep permanent records of staff who is working in their area, in order to maintain effective control in evacuation procedures and medical care. This personnel record must include the following information:

- Full name of staff (operating, contractor, visitor, conveyor, etc.)
- Company name to which it belongs
- Name of the health promoter (EPS)
- Name occupational risk manager (ARL)
- blood type and RH factor
- Allergy information
- Person and telephone emergency

Each facility must have a system of registration of workers and visitors through which you can quickly account for the existence and distribution of staff within the premises as verification and control actions evacuation, in order to confront the total staff evacuated to the number of records.
The health care procedure, should be led by the emergency services, rescue workers and medical personnel, this will depend on the needs and possibilities for each area.

· Evacuation process

Evacuation is the set of activities and procedures aimed at preserving life and physical integrity of persons in the event of being threatened, by moving to, from, through and to lower-risk. For the project two types of evacuation are defined, which will be defined depending on the magnitude of the emergency, these evacuations are:

- Total evacuation: All personnel should be evacuated immediately and secure facilities work
- Only certain personnel will be evacuated from the premises in an organized and: Partial Evacuation

The Table 11.1.3. 24 It shows the criteria to begin evacuation procedures, partial or total.

Table 11.1.3.24: Criteria for initiating evacuation processes

TYPE OF EVACUATION		CRITERIA
Partial	**Total**	
X	X	**6.** Duration of the emergency · T <12 hours · T> 12 hours
X	X	**7.** Process units involved · Camps and process areas · Storage tanks · Fire protection systems · Control rooms
X	X	**8.** committed resources · Elements to fight the accident exceed its magnitude · When resources to combat the accident are insufficient
	X	**9.** kind of product · Products that generate a polluting cloud or potentially explosive atmospheres
X	X	**10.** Level of destruction · Min. workplaces or habitation sites are not affected · Partial. Between 20-70% of infrastructure associated with the project affected · Total. More than 70% of the infrastructure associated with the project affected

Source Gemini Consulting SAS, 2015

The following Figure 11.1.3.8 shows the procedure for evacuation in case of an emergency

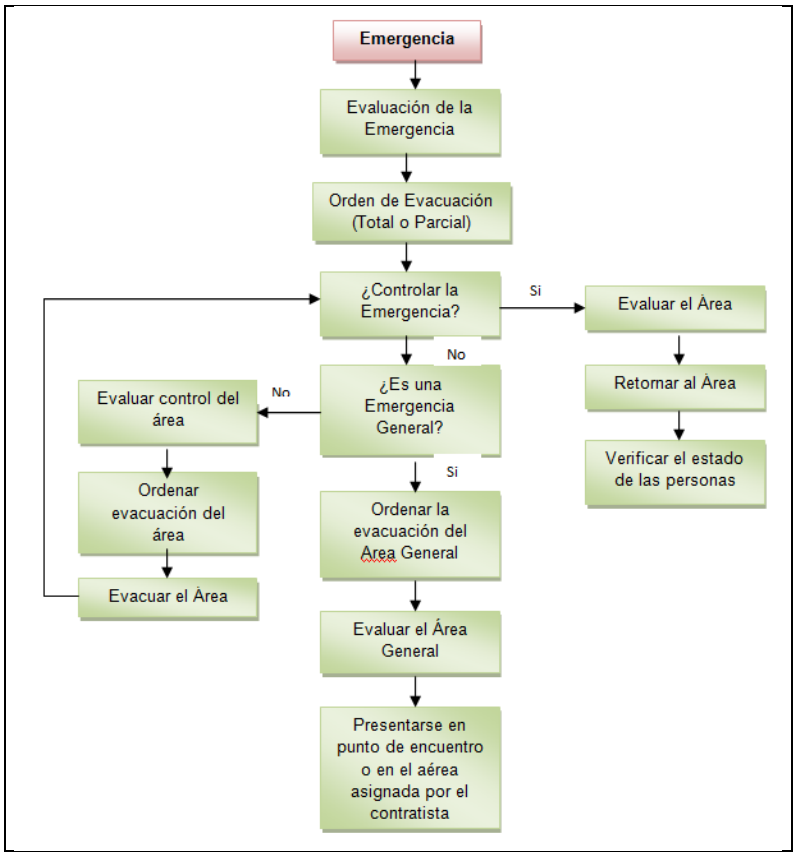


Figure 11.1.3. 10Process for evacuation
Source Gemini consultants SAS

Preparation for the development of evacuation must take into account:

- Detection: Personnel observe or identify an anomalous situation (from monitoring systems or by direct observation), you must notify urgently:
  - Notify the Area Manager.
  - Use the emergency phone

- Alert: The alert status will be declared by the CEO and will be reported to the areas that need to be evacuated.

All staff who is involved in the project, you must know the general guidelines of the evacuation plan, for which the necessary measures will be taken so that this information reaches permanent and new entrants.
Noticing the alarm every sector coordinator immediately ordered the evacuation as previously determined. In these cases there is a series of recommendations to consider, such as:

- Keep valuables and documents and disconnect electrical appliances in charge.
- Then, following indications Manager area, proceed to leave the place to the rules for these cases.
- Offices, administrative areas and plants are evacuated quickly and orderly.
- All outputs must be free of obstacles and under appropriate conditions.
- Keep Calm, one of the fundamental points at all times is to stay calm when we know what we must do, we transmit and security.
- Respiratory protection: when there is the presence of smoke, it is important to protect the airways placing a handkerchief or cloth over your mouth and nose, if possible moistened.
- Not re-enter the area once it has been evacuated.
- The evacuation of sick, injured or disabled persons, should be planned in advance to ensure their safety. It should maintain a permanent record and date of persons prohibited for the purpose of establishing an emergency role for them.
- Ask employees nearby to help anyone ill or suffers injury during an evacuation.
- Once outside the area meet in a safe place with other people (meeting).
- Each group moves to the security area must remain there while verified that the entire group complete evacuation.
- Authorization for staff to return to the building, gives the responsible authority by a return signal previously established.

· Emergency Operations Control

Any response made to an incident or emergency, establishes monitoring, why all the activities must be recorded in different formats, which should be properly archived and systemized. Additionally, in this particular case, you must perform the emergency report to the competent authorities and likewise within the company and project
During the development of the emergency as part of the action plan should be specified at all times: the goal, the exact location of the event that causes and environmental and social characteristics of the area covered by it, the development of the emergency, including others. also they are taken permanent data about the prevailing weather conditions in the area. Based on this information you should make appropriate

adjustments to the initial objectives of the action plan made about the behavior of the emergency.

It must be set if the possible risk persists area affected and the need to alert local authorities

The COE should make continuous assessments of the effectiveness of management actions and advanced control. Based on these assessments will be adjusted action plans in order to achieve greater effectiveness and efficiency in operations

Monitoring and evaluation of operations carried out through the formats established by the company to control emergencies and contingencies. These formats are present before starting operation, any of the formats should be designed for the development of the operation is shown in Table 11.1.3.26

Table 11.1.3.25: Formats monitoring and periodic evaluation of emergency

FORMATS	OBJECTIVE	SCOPE
Incident Summary	Translate the summary of the incident	- Identification of the structure - Map or sketch of the scene - Decisions - Orders - Instructions given -Communications registered -General remarks
Incident Action Plan	Establish the incident action plan	- Specific objectives of the operational period - Strategies - Means - Assignments - Organization for attention
Tactics assignments	Organize tactical assignments	- tactical assignments - Staff Responsibilities
Distribution Channels and Frequencies	Plasmar distribution channels and	- Channels - Frequencies

FORMATS	OBJECTIVE	SCOPE
	frequencies in the incident	
Medical plan	Establish Medical Plan	- existing and available stations for medical assistance in the area of the incident - Transportation of patients - transfer of patients to medical facilities
Registration and Control of Resources	Register and control resources	- Request resources - Time of arrival - Statement of Resources - Responsible
Activity Log	Chronologically organize events that happen during an emergency care	- Personnel assigned - Activities

Source Gemini Consulting SAS, 2015

The accounting expense ratio mitigation and emergency care and primary cleaning should be carried separately from the expenses for decontamination and remediation actions. Care expenses to be considered correspond to:

- Personal expenses.
- Transportation expenses.
- Fuel costs.
- Food and lodging expenses.
- Expenses for chemical inputs.
- Equipment rental costs.
- Consumables costs.
- Expenses biodegradation of contaminated soil and plant material.

All costs must be duly authenticated receipts and invoices, as these support the report for charging policies to insurance companies.

· Completion of Emergency

After the emergency, the COE will develop a series of activities in order to determine the time of decommissioning operations (operational closure), assess the consequences of emergency concerning the efficiency of mitigation processes and effects on the environment both by the emergency itself as response efforts developed on the occasion of this and finally know and assess the damage and elements used, to thereby establish responsible for replacements and repairs that might arise.

It is important to consider the environmental management of the waste generated in the contingency or during recovery efforts, considering the actions proposed in the Environmental Management Plan of this study, in relation to the management of domestic solid waste, hazardous waste and special .

The main recovery actions to be carried out in the area of the incident, once the emergency are:

- Removal of Equipment and Elements

After the emergency attention to the removal of materials, equipment and items that have been damaged fully or partially by the same, thereby seeking it is necessary:

- Save those who have not suffered consequences, or having got suffered, they can recover partially or completely
- Decrease the latent risk caused by instabilities and disorder affected area.
- Facilitate qualitative and quantitative assessment of losses.
- Facilitate the adaptation of the affected areas and the resumption of activities in it.

Debris removal must take into account the following considerations:

- It should be done as sufficiently careful to avoid injury or additional damage to equipment and facilities and not to destroy evidence needed for the investigation
- It must be performed in response to a method involving procedures and equipment.

To effect removal of debris shall proceed in the manner discussed below.

- Do not start work until you have the consent of the authorities and the Underwriting Agencies.

- Inspect the area trying to classify and quantify the extent of activities such as demolition of structures, repair materials, equipment and facilities, disposal of debris and waste, and collection and reconditioning areas.
- Determine the need for human and technical resources necessary to implement the planned activities and provide them with the necessary personal protective equipment such as boots, gloves, helmets and respiratory protection if necessary.
- Plan the runtime of the planned work.
- In administrative and camp areas, ensure that water services, energy and gas, are suspended in the area, and only allows lighting.
- If risks to stability are imminent, first perform demolition work.
- Sort and select the areas and the status of the items found.
- Select a site for waste, which is close enough to reduce transportation costs; that is of sufficient capacity, permitted use and offers no risk to the community.
- Evaluate the time provided for measures with internal resources, against the cost of hiring them externally.
- Do not make negotiations of any kind with materials and / or equipment whose loss is compensable by the insurance company.
- Make a list of damaged items and state thereof.

· Incident Investigation

The research activities are developed in order to identify and assess the root causes of the accident and development and establish responsibilities. Research should include:

- Information about the accident: name and identification of the victim (if any), date and time of the accident, the accident site (village, municipality, department), identifying the contractor, transport route (identification way), activity performed when it occurred accident.
- Detailed description of the activities carried out before the accident.
- medical diagnosis of the injured.
- Accident statistics: analysis and classification of all incidents
- Accident assessment (risk assessment).
- documentary collection: photographs, interviews, inspection of the accident site, documents (roadmap, policies, emergency card), among others.
- Root cause analysis: identifying immediate causes, root causes and system failures.
- Establish corrective and preventive actions.
- Dissemination of lessons learned and lessons learned.

· Final report of the Emergency

The final report should be submitted within a period not to exceed twenty (20) days from the completion of emergency care and shall contain at least the following aspects:

- Date and time of the event and date and time of the initial notification made.
- Date and time of completion of the emergency.
- Location of the emergency.
- Origin of emergency.
- Cause of emergency.
- Scale of the emergency.
- Determination of affected areas (land, natural resources, facilities).
- Determination of affected communities.
- Action plan developed and response times
- Description of prevention, mitigation, correction, monitoring and restoration adopted.
- necessary support (requested / obtained).
- Reports made to other government entities.
- Decontamination costs (containment, collection, storage, retrieval and / or cleaning).

· Evaluation and improvement of PGR

After completion of the emergency and based on the daily reports of operations or activities, a detailed assessment of the effectiveness of the Risk Management Plan will be made, with reference to emergency care.

The evaluation will determine the most important to consider the reformulation and redesign of the PGR, based on the experience gained following the emergence aspects.

Evaluation activities will include workshops involving all persons involved in handling the emergency, in order to analyze the results and establish the "lessons learned".

Based on the level of success in controlling the emergence and lessons learned, should make an assessment of the effectiveness of the RMP. The evaluation will determine the most important aspects to consider for the reformulation and redesign of the Risk Management Plan To carry out this evaluation the following aspects are analyzed:

- Response levels of the company.
- Analysis of operational risks.
- Roles and responsibilities within the organization.
- Channels of information to the community.

- Equipment for emergency control.
- Communications systems.
- Training and simulation program.
- Structuring the Information Technology Plan. Existence of plates, maps, plans. Critical information, inventory control equipment, list of authorities, among other areas.

The lessons learned should be disseminated all persons responsible for the management and control of emergencies in different areas, contractors and Emergency Care, among others.

Information system

Alerts are measures of forecasting and preparedness related to two aspects: the previous information that exists about the evolution of a phenomenon, and the actions and measures to be taken by the Committees for the Prevention and Attention to Disasters to address the situation It is expected.

Direct responsibility to declare the different levels of alert rests with the Local and Regional Committees, depending on the scope of the situation, based on technical information provided by a competent institution, for that matter, by theInstitute of Hydrology, Meteorology and Environmental Studies-IDEAMAnd the local behavior, which is subject to the conditions and the level of protection, and local mitigation. This implies the need for preparation for emergency care by the Committees, among others, alarm mechanisms, information, evacuation, temporary shelter, basic items as well as financial resources, as provided by Law 919 of Decree 1989.

Yellow alert

Actions involving the declaration of the yellow alert are: Convene the Committee for the Prevention and Attention of Disasters. Locate critical points and define monitoring mechanisms, high alert and evacuation, based on census and risk maps. Make an inventory of human, technical, economic, equipment, facilities and emergency supplies.

Orange alert

Actions involving the declaration of orange alert are: Prepare for possible evacuation operations. Inform the community about the warning systems in case of emergency. Set enlistment of equipment and personnel. Coordinating temporary housing. Review emergency plans, including health activities, transportation, debris removal, road suitability.

Red alert

Actions involving the declaration of the red alert are: Activate preset alarms. Evacuate and ensure the affected population. Mobilize operating as emergency plans. Meet the basic needs affected population.
Finally the Directorate General for Disaster Attention and Prevention reiterates the importance of them there are close relations of coordination, interaction and permanent communication on measures taken and registered emergency situations, among different instances.

Given the possible effects it is important for an event that may be present:

- Loss of information: To do this, make a backup of the periodic systematization of information and field work digitizing information. This information can be preserved in a cloud or on hard drives where confidential information and their conservation is guaranteed.
- To failures or cellular telephone service must be maintained radio communication phone.
- Keep battery operated radio to keep informed.
- Have the phone numbers of emergency and updated in visible places.
- Keep screens with information.
- He sent emails to entities