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EL SALVADOR

USAID Tropical Storm Ida Reconstruction Project

Programmatic Environmental Mitigation Plan for Clinics

March 2013

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Note:

The author's opinions expressed in this publication do not necessarily reflect the viewpoints of the United States Agency for International Development or of the Government of the United States.

Acronyms

EA	Environmental Assessment
EMP	Environmental Mitigation Plan
GIS	Geographic Information Systems
GOES	Government of El Salvador
GRAM	GRAM Arquitectos S.A. de C.V.
IEA	Initial Environmental Assessment
MARN	Ministry of the Environment and Natural Resources
MINSAL	Ministry of Health
PMA	Medical Architectural Program
PEA	Programmatic Environmental Assessment
R/R	Reconstruction/Rehabilitation
STP	Technical Secretariat of the Presidency
USAID	United States Agency for International Development
UCSF	Community Family Health Units

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1. Introduction

This document presents a Programmatic Environmental Mitigation Plan based on a qualitative analysis of the potential environmental impacts of a set of Community Family Health Units (abbreviated as UCSF for their initials in Spanish) located in several municipalities of the El Salvador.

Potential impacts were determined through a rapid assessments previously carried out at each site by each subcontractor responsible for the design of each one of the projects in coordination with the Ministry of Health of El Salvador as the government institution benefiting from each project.

Three levels are used to express potential environmental impacts' order of importance: 1-Green, 2–Yellow and 3-Red; defined as follows:

- **1-Green**: Low impact levels; in the context of this environmental assessment, this level means that the changes associated with anticipated activities, activity levels or processes will probably result in little or no effect on the quality of the human environment at the program level. These impacts do not require mitigation and are well within the standard, regulatory or policy limits for environmental protection.
- **2-Yellow**: Medium impact levels. This level means that the changes associated with activities, activity levels or processes will probably result in moderate adverse effects on the environment at the program level. These are short-term or low-intensity effects and do not reach a significant level. Medium impacts do not create effects that exceed the standard, regulatory or policy limits for environmental protection.
- **3-Red:** High impact levels means that the changes associated with activities, levels of activity or processes will likely result in adverse effects on the environment according to the conditions of each site. The level of these impacts depends on site conditions, as well as on intensity and duration of changes. These impacts exceed allowable limits of current environmental regulations.

Sites are classified in three potential environmental action scenarios based upon the territory in which the facilities are located. These are: coastal plain, scattered mountains and central plain/urban.

2. Scope

Based on the analysis of potential environmental impacts for each studied location, this report presents a Programmatic Environmental Mitigation Plan for a set of 14 Community Family Health Units (UCSF) damaged by Tropical Storm Ida, which impacted the Salvadoran territory in November 2009.

3. Purpose

The purpose of this Programmatic Environmental Mitigation Plan is to provide intervention guidelines to be taken into account during the construction and operation stages of the UCSFs included in the scope of this project.

The design-build Contractor will use the Programmatic Environmental Mitigation Plan and adapt it to each and every UCSF for which it is responsible, with the purpose of implementing and monitoring all environmental mitigation activities related to the final design and construction process. Socio-economic mitigation activities must, in all cases, include provisions to foster gender equality.

4. Description of project sites

4.1. List of projects analyzed

Fourteen UCSFs were analyzed, located in municipalities and departments within territorial scenarios as described below:

ID	Site	Municipality	Department	Territorial Scenario
1	Community Family Health Units (UCSF) Santa Lucía Orcoyo	OLOCUILTA	LA PAZ	Scattered mountains
2	Community Family Health Units (UCSF) El Pimental	SAN LUIS	LA PAZ	Coastal plain
3	Community Family Health Units (UCSF) San Pedro Perulapán	SAN PEDRO PERULAPAN	CUSCATLAN	Scattered mountains
4	Community Family Health Units (UCSF) Jerusalén	JERUSALEN	LA PAZ	Scattered mountains
5	Community Family Health Units (UCSF) Periférica de Cojutepeque	COJUTEPEQUE	CUSCATLAN	Scattered mountains
6	Community Family Health Units (UCSF) de San Juan Tepezontes	SAN JUAN TEPEZONTES	LA PAZ	Scattered mountains
7	Community Family Health Units (UCSF) San José La Paz Arriba	SAN JUAN NONUALCO	LA PAZ	Coastal plain

ID	Site	Municipality	Department	Territorial Scenario
8	Community Family Health Units (UCSF) San Emigdio	SAN EMIGDIO	LA PAZ	Scattered mountains
9	Community Family Health Units (UCSF) El Rosario, Cuscatlán	EL ROSARIO	CUSCATLAN	Scattered mountains
10	Community Family Health Units (UCSF) San Carlos Lempa	TECOLUCA	SAN VICENTE	Coastal plain
11	Community Family Health Units (UCSF) San Ildefonso	SAN ILDEFONSO	SAN VICENTE	Scattered mountains
12	Community Family Health Units (UCSF) La Herradura	SAN LUIS LA HERRADURA	LA PAZ	Coastal plain
13	Community Family Health Units (UCSF) El Rosario, La Paz	EL ROSARIO	LA PAZ	Coastal plain
14	Community Family Health Units (UCSF) Dr. Alberto Aguilar Rivas	NUEVA SAN SALVADOR	LA LIBERTAD	Central plain/ Urban

Table 1 List of projects by territorial scenario

4.2. General location of Community Family Health Units (UCSF)

The following image presents, by municipality, the location of the 14 UCSF.

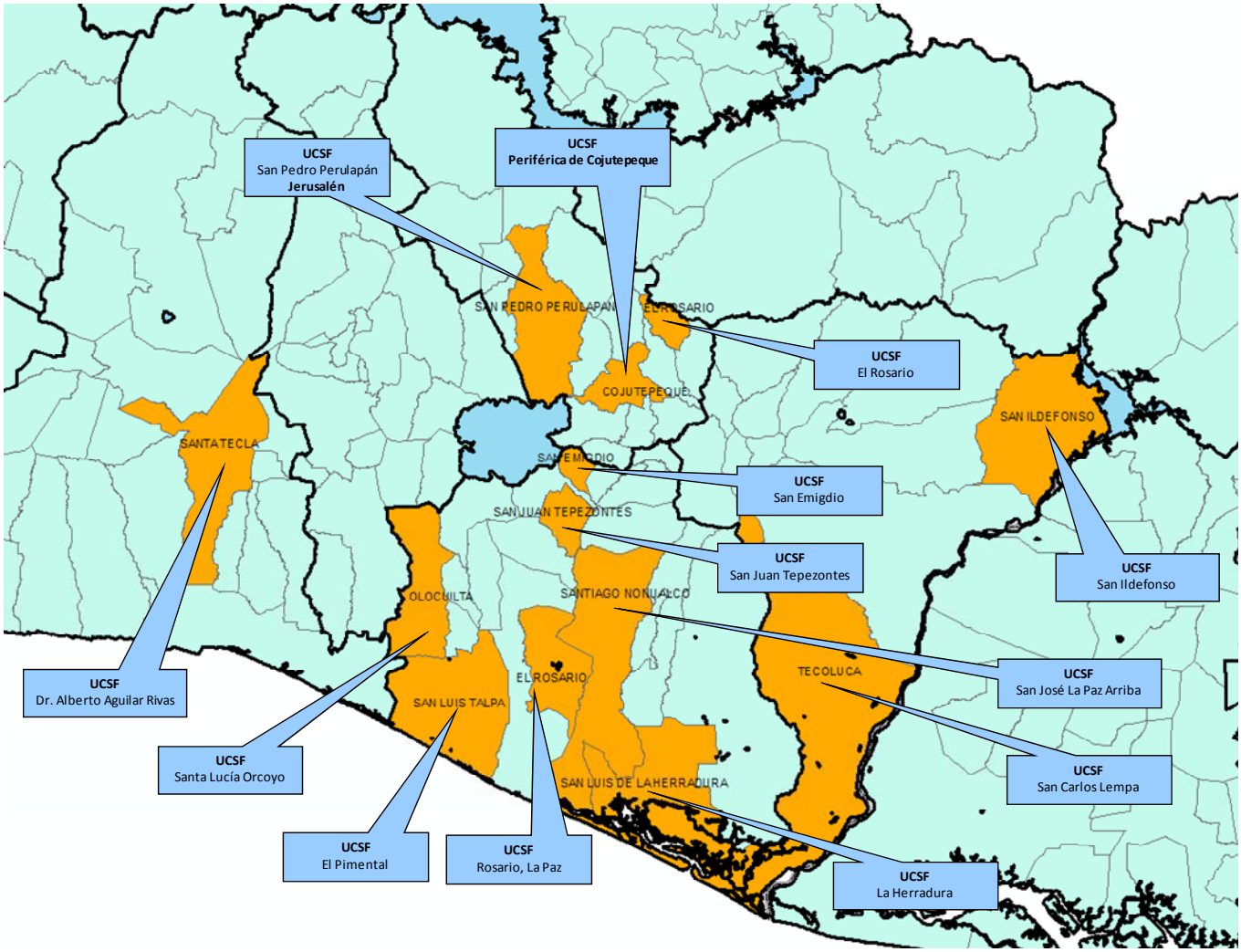


Image 1 General map of UCSF locations

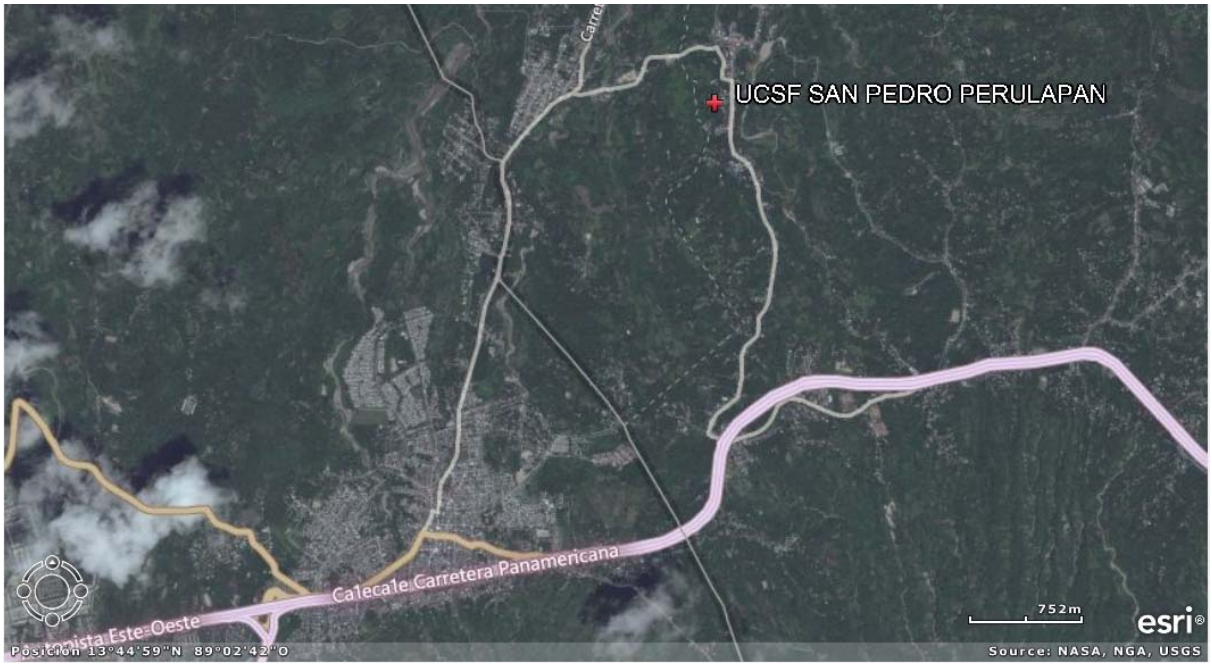
4.3. Location maps and coordinates by project

The following tables (and graphics) present the geographical coordinates of latitude and longitude (expressed in degrees, minutes and seconds), datum NAD27 of all the locations, using a navigation GPS (Global Positioning System).

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
1	UCSF Santa Lucía Orcoyo	La Paz	Olocuilta	13	28	35.056	-89	9	23.854

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
2	UCSF El Pimental	La Paz	San Luis Talpa	13	25	2.249	-89	7	18.911

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
3	UCSF San Pedro Perulapán	Cuscatlán	San Pedro Perulapán	13	45	44.439	-89	2	18.112



ID	UCSF Name	Department	Municipality	Latitude			Longitude		
4	UCSF Jerusalén	La Paz	Jerusalén	13	39	10.534	-88	54	1.927

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
5	UCSF Periférica de Cojutepeque	Cuscatlán	Cojutepeque	13	43	32.438	-88	56	4.31

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
6	UCSF San Juan Tepezontes	La Paz	San Juan Tepezontes	13	36	44,888	-89	0	25.697

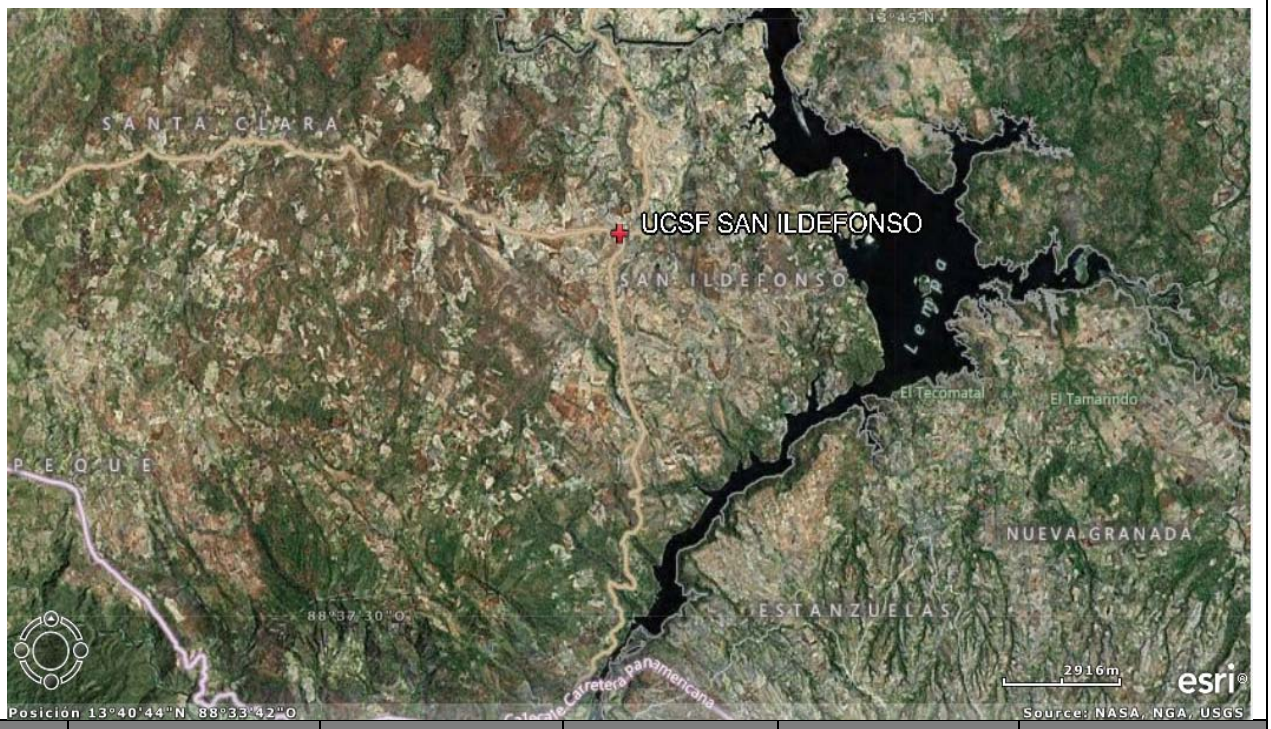
ID	UCSF Name	Department	Municipality	Latitude			Longitude		
7	UCSF San José de la Paz Arriba	La Paz	Santiago Nonualco	13	30	52.224	-88	58	6.887

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
8	UCSF San Emigdio	La Paz	San Emigdio	13	38	51.889	-88	58	34.682

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
9	UCSF El Rosario	Cuscatlán	El Rosario	13	46	12.513	-88	54	44.881

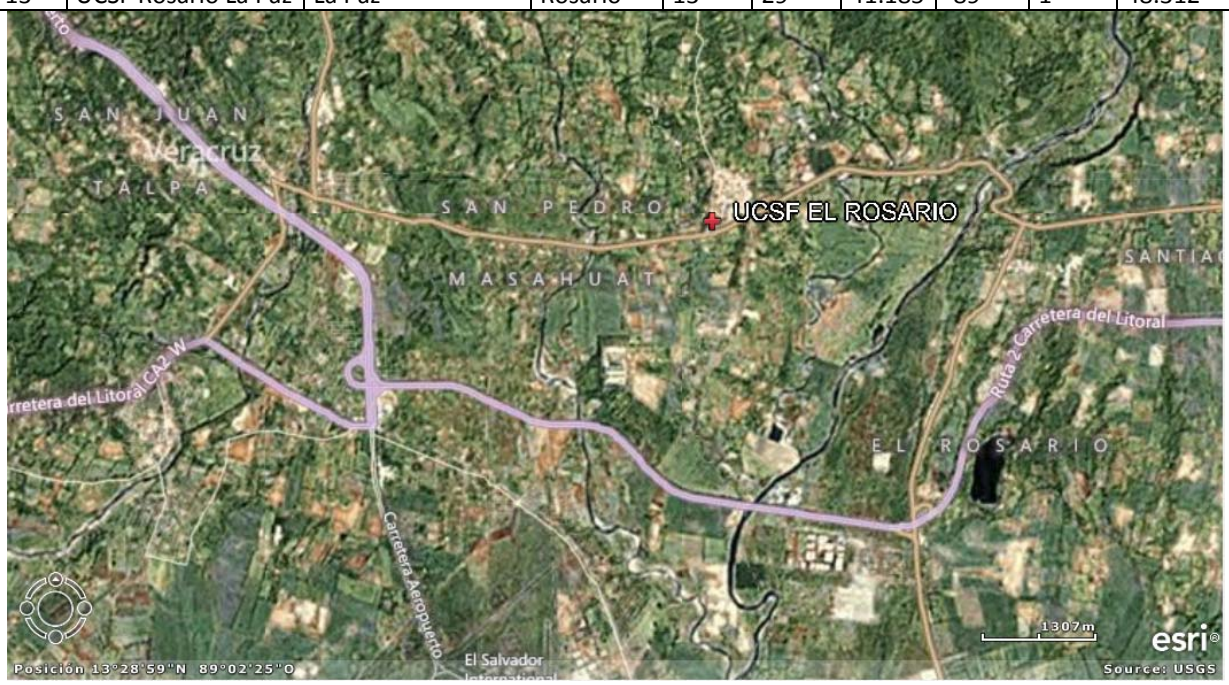
ID	UCSF Name	Department	Municipality	Latitude			Longitude		
10	UCSF San Carlos Lempa	San Vicente	Tecoluca	13	22	42.54	-88	45	23.163

ID	UCSF Name	Department	Municipality	Latitude			Longitude13		
11	UCSF San Ildefonso	San Vicente	San Ildefonso	13	42	15.192	-88	33	47.138



ID	UCSF Name	Department	Municipality	Latitude			Longitude		
12	UCSF San Luis La Herradura	La Paz	La Herradura	13	20	53.972	-88	57	23.328

ID	UCSF Name	Department	Municipality	Latitude			Longitude		
13	UCSF Rosario La Paz	La Paz	Rosario	13	29	41.185	-89	1	48.312



ID	UCSF Name	Department	Municipality	Latitude			Longitude		
14	UCSF Alberto Aguilar Rivas	La Libertad	Santa Tecla	13	40	58.655	-89	18	14.289

5. Project descriptions[1]

This section includes details of each UCSF (accessibility, terrain, status of facilities and public services) for the purpose of a qualitative determination of recommended intervention levels.

5.1. **(UCSF) Santa Lucía Orcoyo**, located in the municipality of Olocuilta, department of La Paz.

Accessibility:

The Project can be accessed through the coastal highway (Km 51 ½), turning north on the road to Planes de Las Delicias. The UCSF is located approximately 350 m farther on the ballast road.

Image 2 **Main entrance UCSF Santa Lucia Orcoyo.**

Land:

The total area is 1,332 m^2 (according to the property deed). The terrain is slightly flat, rectangular in shape, slightly sloping towards the south boundary. The adjacent land to the East is lower. The buildings of the UCSF are located in the northern strip of land and are almost at street level, but exposed to floods during the rainy season from street runoff. The unbuilt area has scattered vegetation, mostly trees and small diameter shrubs. The land belongs to the Ministry of Health.

Status of Facilities:

The facilities are highly deteriorated; therefore, the UCSF has been transferred to a private location where it currently provides its services. Due to the condition of the buildings, these should be torn down entirely, including all external work.

Image 3 **UCSF buildings at Santa Lucia Orcoyo.**

Existing public services:

Electricity, public drinking water and phone services are available. There is no collective sewage system and no collection service for common solid waste. Bio-infectious wastes are collected periodically by MINSAL.

[1] Information collected from rapid assessment data, subcontractor Gram Arquitectos S.A. de C.V., 2012.

5.2. **(UCSF) El Pimental**, located in the municipality of San Luis, department of La Paz.

Accessibility:

Image 4 Main entrance UCSF El Pimental.

The UCSF can be accessed by the paved road that connects San Luis Talpa with La Zunganera beach, approximately 8.2 Km from the detour from San Luis Talpa to the project.

Land:

The total area is 1,296.00 m2, with flat topography, trapezoidal shape and a slight slope towards the South. The property is completely planted with trees, mainly fruits (dense mangoes). The location of the land and the buildings are under street level and has flooding problems. The vicinity is residential property except to the North, which is cattle land with facilities for that use. The property of the land is under legalization process.

Status of Facilities:

In a general description, the buildings show deterioration of the roof and in the structures in the doctor's offices due to the short-lived materials used. At plain sight, walls seem to be in good conditions since they were built recently (1999); external work is in good condition.

Image 5 UCSF El Pimental facilities

Existing public services:

Electricity, public drinking water and phone service are available. Sewage is processed in a septic tank. There is no provision of common solid waste collection service. In the case of bio-infectious waste, this is collected periodically by MINSAL.

5.3. **(UCSF) San Pedro Perulapán**, located in the municipality of San Pedro Perulapán, department of Cuscatlán.

Accessibility:
Access to the land foreseen for the reconstruction of the UCSF is from the street level, through a ramp.

Image 6 UCSF San Pedro Perulapán.

Land:

It has a total area of 1479.00 m^2, of irregular shape, with three straight sides and a curved side; the topography of the immediate vicinity is irregular. There are no buildings on the premises; it is currently flat, since the municipal office carried out earthworks.

At the location, it can be seen that there's been some cutting and land filling to complete the terrace; however, the lack of control in compaction is evident because the western sector shown an erosion process. At the southwest, the land has a couple of valley floor of certain depth, completely planted with trees with soils that are not very consolidated. A sewage pipe crosses the land, parallel to its southern slide, serving the houses located to the East, on the other side of the street. The land belongs to the Ministry of Health.

Image 7 Vicinity with valley floors

Existing public services:

Electricity, public drinking water and sewage services are not available; however, there is solid waste collection service.

5.4. **(UCSF) Jerusalén**, located in the municipality of Jerusalén, department of La Paz.

Accessibility:
This health unit is easily accessed and is located in the municipality downtown. It has access roads in its four sides.

Image 8 Access to UCSF Jerusalén.

Land:

The total area is 1233.34 m^2, with irregular shape and flat topography. The land level is very close to the street. According to site observations, the free areas of the property have some non-significant erosion of about 10-15 cm. which left external work exposed (boxes, sidewalks, channels, etc.); the land belongs to the Ministry of Health.

Status of Facilities:

The UCSF was built 22 years ago and it is in an advanced deterioration state; therefore, MINSAL has decided that it should be completely torn down.

Image 9 Internal facilities of UCSF Jerusalén.

Existing public services:

Electricity, drinking water from ANDA, and phone services are available. Sewage is processed in a septic tank; there is common solid waste collection service. Bio-infectious wastes are collected periodically by MINSAL.

5.5. **(UCSF) Periférica de Cojutepeque**, located in the municipality of Cojutepeque, department of Cuscatlán.

Image 10 **View of Access to UCSF Periférica de Cojutepeque.**

Accessibility:

Located in the urban area of Cojutepeque, Access is from the detour to the old Pan-American Highway and the José María Rivas Avenue, at a distance of approximately 150 m northwards on the same avenue.

Land:

The total land area allocated for construction is not marked; this is part of the general land where the Cojutepeque Hospital was located; the UCSF that will be torn down is operating at this location. The land is crossed by vehicle traffic since it is the access to the remaining facilities and to the shared parking area. Besides, in a segregated portion, there is a building that will be refurbished to be added to the new infrastructure; there is also a water storage tank for common use that is deteriorated. The property deed is legalized in favor of the Ministry of Health.

Status of Facilities:

The existing facilities, built in 1959, show a high deterioration level and must be torn down, except for the buildings located in the southeast sector, which will be refurbished.

Image 11 **Detail of internal facilities of UCSF Periférica de Cojutepeque.**

Public services:

The site has electricity, drinking water supply and phone service. Sewage is discharged into the public sewer network, and there is common solid waste collection service. Bio-infectious wastes are collected periodically by MINSAL.

5.6. **(UCSF) San Juan Tepezontes**, located in the municipality of San Juan Tepezontes, department of La Paz.

Accessibility:

Located in the urban area of San Juan Tepezontes; access to the UCSF is significantly difficult because the slope of the Access road exceeds 35% (Los Santos Ave.). However, the access road is paved.

Image 13 **Detail of Access to UCSF San Juan Tepezontes.**

Land:

The total land area is 944.90 m^2, with irregular shape and topography; the buildings are located in a terrace surrounded by slopes towards the buildings located to the North and retention walls towards the southern boundary. The surrounding topography is very rough; therefore, the land is amid buildings located at higher levels and empty land at a lower level. The land belongs to the Ministry of Health.

Image 14 **External view of UCSF San Juan Tepezontes.**

Status of Facilities:

Due to the age of the facilities and their state of deterioration, total demolition is required.

Existing public services:

The site has electricity, drinking water supply and phone services. Sewage is discharged into the public sewer network, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

5.7. **(UCSF) San José La Paz Arriba**, located in the municipality of San Juan Nonualco, department of La Paz.

Accessibility:

Access to the UCSF is through the old road to Zacatecoluca, taking as a reference the detour to San Pedro Nonualco; the Project is 1,700 meters from the detour and then left for 700 m, on a ballast road.

Image 15 **Access to USCF San José La Paz Arriba.**

Land:

The total land area is 1,379.41.00 m^2, with a flat, rectangular shape and planted with trees. The land and the existing facilities are above street level, with a difference of approximately 3.00 m. The adjacent land is for residential and agricultural use. The northern boundary is flat, with drainage problems in the rainy season, getting flooded. The property is legalized in favor of the Ministry of Health.

Status of Facilities:

The buildings show deterioration in roofs and concrete ledges, where the steel reinforcement is exposed and corroded. Walls do not show damage. It is foreseen that the whole infrastructure will be torn down.

Existing public services:

The site has electricity, drinking water supply through the public network but without phone service. Sewage is processed in a septic tank, and there is no provision of solid waste collection service. Bio-infectious wastes are collected periodically by MINSAL.

Image 16 **Imagen de espacio interno de USCF San José La Paz Arriba.**

5.8. **(UCSF) San Emigdio**, located in the municipality of San Emigdio, department of La Paz.

Image 17 **External view of UCSF San Emigdio.**

Accessibility:

The UCSF is located in the urban area of San Emigdio; with ease of access on a paved road.

Land:

The land area is 1,379.41 m^2, according to data provided by MINSAL. However, an inspection visit revealed a lower area of approximately 355.00 m2; the site allocated for reconstruction is the same one where the UCSF is currently operating, with a rectangular shape and flat topography. The property is in legalization process.

Status of Facilities:

Due to the age of the facilities and their state of deterioration, total demolition is required.

Image 18 **Waiting room in UCSF San Emigdio.**

Existing public services:

The site has electricity, drinking water supply and phone services. Sewage is processed in a septic tank, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

5.9. **(UCSF) El Rosario**, Cuscatlán, located in the municipality of El Rosario, department of Cuscatlán.

Accessibility:

The UCSF has good access, located in the northwestern exit of the urban area.

Image 19 **Access to UCSF El Rosario.**

Land:

The land area is 1015 m^2, with trapezoidal shape and irregular topography. The buildings are located in terraces, with significant level differences; the terrace where the main module is located is between 2 and 3 meters above street level. The empty areas are planted with trees, and there are stone walls in each terrace. The land belongs to the Ministry of Health.

Image 20 **Detail of facilities at UCSF El Rosario.**

Status of Facilities:

The facilities of the UCSF were built 39 years ago (1972) and have not been maintained since they were built. They present deterioration due to the effects of time and natural phenomena (storms and hurricanes).

Public services:

Electricity, drinking water supply (municipal) and phone services are available at this site. Sewage is processed in a septic tank, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

5.10. **(UCSF) San Carlos Lempa**, located in the municipality of Tecoluca, department of San Vicente.

Accessibility:

Access to the UCSF is through a paved road in the vicinity of the Golden Bridge over the Lempa River, connected to the road that leads to San Carlos Lempa, at a distance of 8.0 Kms.

Image 21 **Detail of access to UCSF San Carlos Lempa.**

Land:

The land area is 1307.26 m2, with rectangular shape and flat topography, with a light slope towards the Southeast, and it is planted with trees. The land and the buildings are located below the paved road level (-20 cms) and have flood problems. With the last rains (E-12), water exceeded 50 cms. above the perimeter sidewalk. The vicinity of the site is residential land. The land belongs to the Ministry of Health.

Image 22 **Infrastructure of UCSF San Carlos Lempa.**

Status of Facilities:

In general, the facilities present deterioration in the roof and all architectural and structural components. The existing buildings will be torn down.

Public services:

The site has electricity, drinking water supply (municipal) and phone service. Sewage is processed in a septic tank followed by an irrigation field, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

5.11. **(UCSF) San Ildefonso**, located in the municipality of San Ildefonso, department of San Vicente.

Accessibility:

The UCSF has good access, located at the convergence of the roads coming from Santa Clara and from the Cuscatlán bridge, within the urban area of the municipality.

Image 23 **Land and infrastructure at UCSF San Ildefonso.**

Land:

The land area is 2,500 m2, with rectangular shape, flat topography and a slight slope towards the North, and is planted with trees. The land belongs to the Ministry of Health.

Status of Facilities:

The UCSF was built in 1964, 48 years ago, and was renovated and expanded in 2005. This later part will be maintained; however, repairs must be made due to the premature deterioration of floors and other building components. The remaining older facilities will be torn down.

Image 24 **Detail of waiting room at UCSF San Ildefonso.**

Public Services:

The site has electricity, drinking water supply (municipal) and phone service. Sewage is processed in a septic tank followed by an irrigation field, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

5.12. **(UCSF) La Herradura**, located in the municipality of San Luis La Herradura, department of La Paz.

Accessibility:

The UCSF can be accessed and is located in the urban area of the municipality.

Image 25 **Main entrance to UCSF La Herradura.**

Land:

The land area is 2,093 m2, with flat, rectangular, topography and planted with trees. The land and buildings are located near the street level and with the last rains (E-12), street runoff exceeded the drainage capacity of the land, producing floods on it. This UCSF is surrounded by residential land. The property belongs to the Ministry of Health.

Status of Facilities:

The buildings show deterioration in roofs and in almost all architectural, structural, electrical and hydraulic components, etc. Walls seem to be in good condition.

Image 26 **Detail of waiting room at UCSF La Herradura**

Public Services:

The site has electricity, drinking water supply (municipal) and phone service. Sewage is processed in a septic tank followed by an irrigation field, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

5.13. **(UCSF) El Rosario**, La Paz, located in the municipality of El Rosario, department of La Paz.

Accessibility:

The UCSF is located in the urban area of the municipality of El Rosario, in the entrance by the old Pan-American Highway. Access is immediate through a paved road.

Land:

The land area is 2,087 m2, with rectangular topography and irregular shape, with significant level differences towards the South, where it shows erosion problems. The land is adjacent to two main roads, towards the North and the South, with access in both sides. The land belongs to the Ministry of Health.

Image 27 **Access to UCSF El Rosario.**

Status of Facilities:

The UCSF was built in 1974 and renovated in 1994 and 2002. In general, the facilities are in good condition, with the exception of roofs and ledges, which suffered damages from Tropical Storm Ida. In the case of superficial rain drainages, these show deficiencies in their water evacuation capacity during prolonged rains.

Public Services:

The site has electricity, drinking water supply (municipal) and phone service. Sewage is processed in a septic tank followed by an irrigation field, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

Image 28 **Facilities at UCSF El Rosario.**

5.14. **UCSF Dr. Alberto Aguilar Rivas**, located in the municipality of Santa Tecla, department of La Libertad.

Accessibility:

Access to the UCSF is through the road from San Salvador to Colonia Quezaltepeque, without any Access problems.

Image 29 **Main access to UCSF Dr. Alberto Aguilar Rivas.**

Land:

The land area is approximately 2,700 m^2, with rectangular shape and planted with trees. Topography is flat, with a slight slope towards the southern boundary. Level differences with respect to Access road are not significant.

Status of Facilities:

The facilities were built in 1974 and are 37 years old. The space currently used by the director's office was added in 2004. In general, the construction shows a high level of deterioration in roofs, ceilings, hydraulic sanitary system, electrical network, floors, etc. The walls do not show damage.

Image 30 **Waiting room at UCSF Dr. Alberto Aguilar Rivas.**

Public Services:

The site has electricity, drinking water supply and phone service. Sewage is discharged into the public sewer network, and there is common solid waste collection service available. Bio-infectious wastes are collected periodically by MINSAL.

6. Description, environmental characterization

The environmental characterization includes:

- Physical Environment: hydrography, geology, land use, susceptibility to landslides
- Biological Environment: Predominant vegetation
- Socio economic and Cultural Environment

6.1. Physical Environment

6.1.1. Hydrography

The hydrographic features in the images shown below present the level of susceptibility due to flooding from overflowing rivers and streams, classified in four categories: low, high, moderate and high.

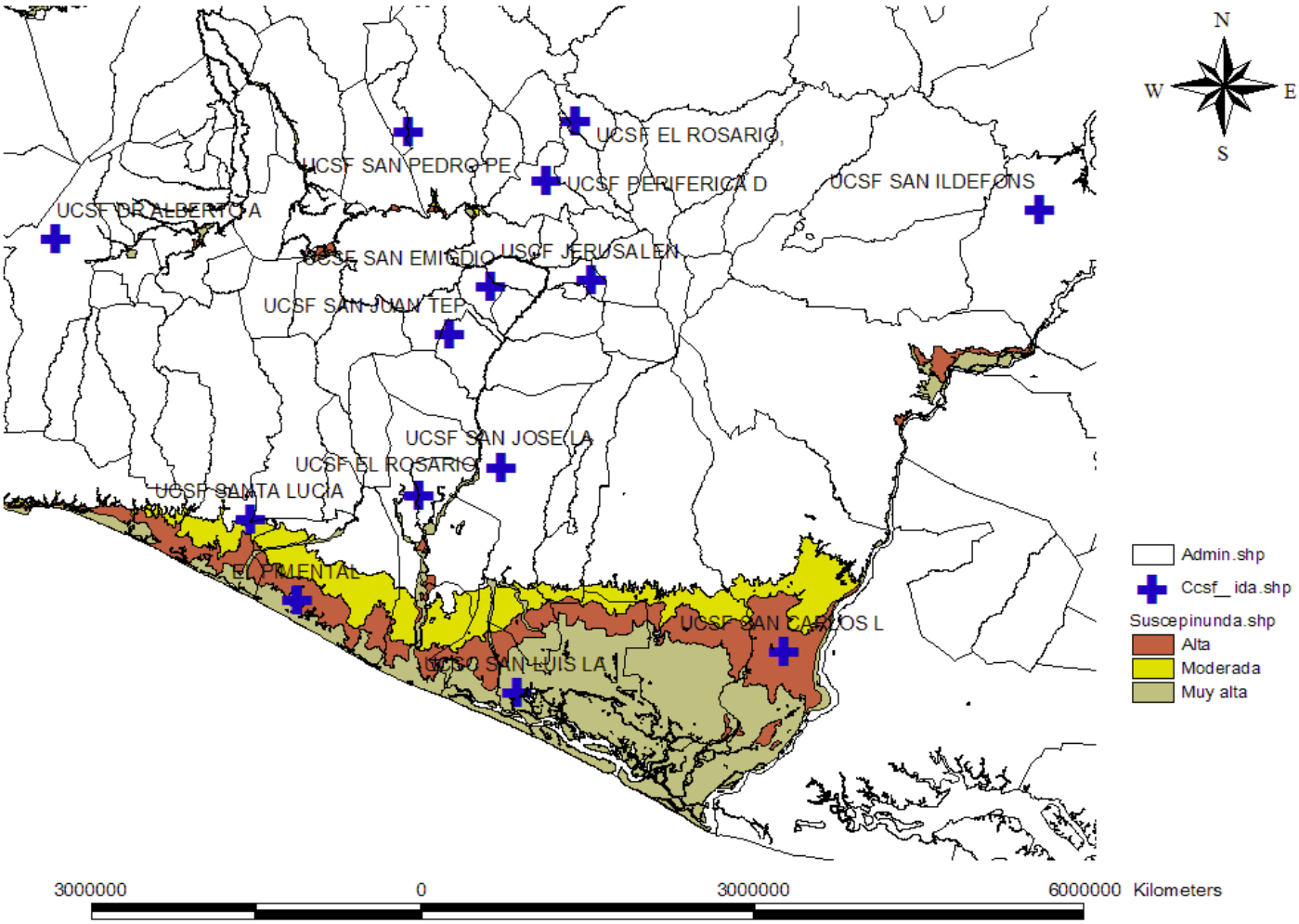


Image 31 Susceptibility to floods; Source: MARN, Elaborated in-house

6.1.2. Geology and location of faults

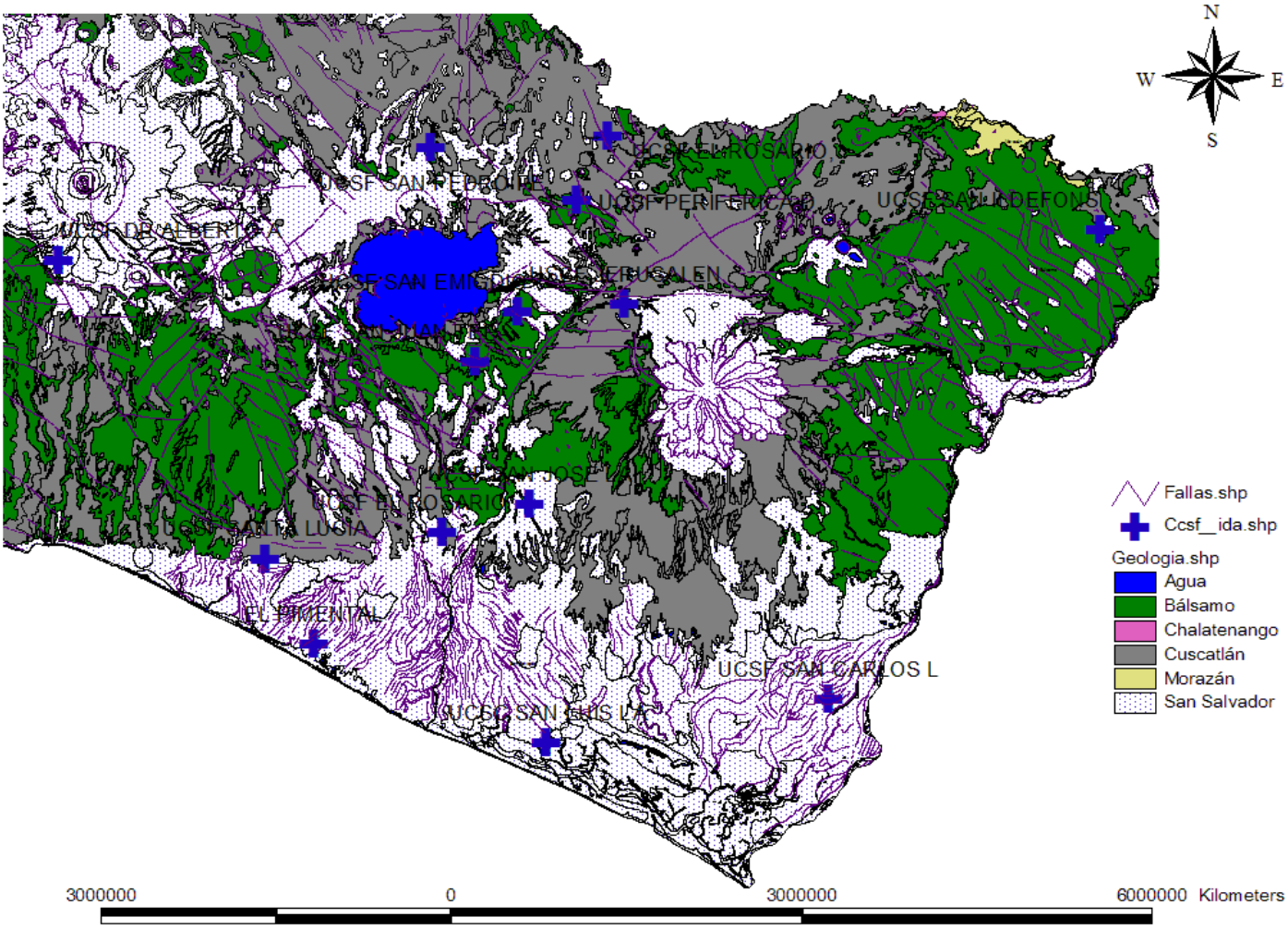


Image 32 Geological and fault map; Source: MARN, Elaborated in-house

6.1.3. Land use

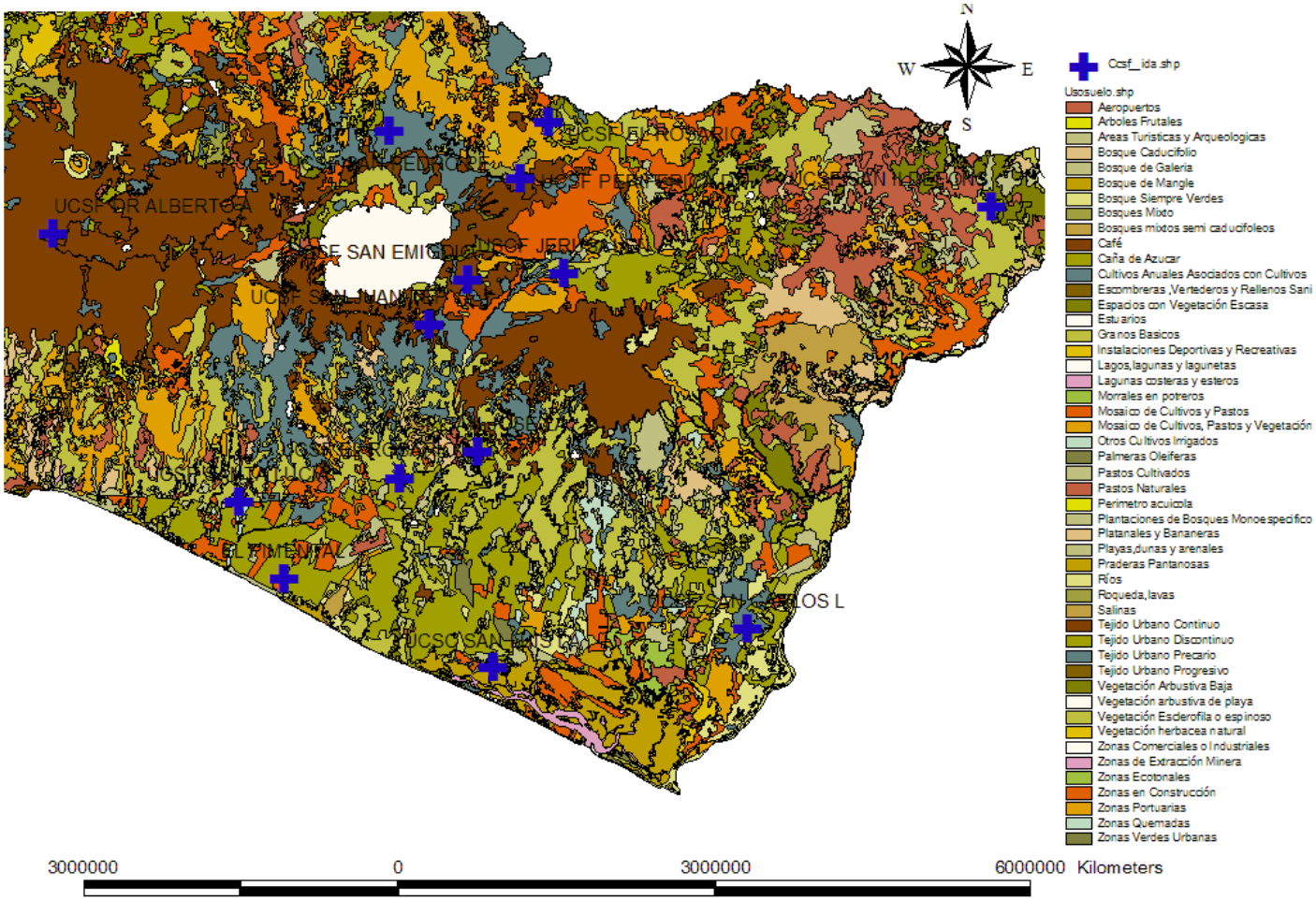
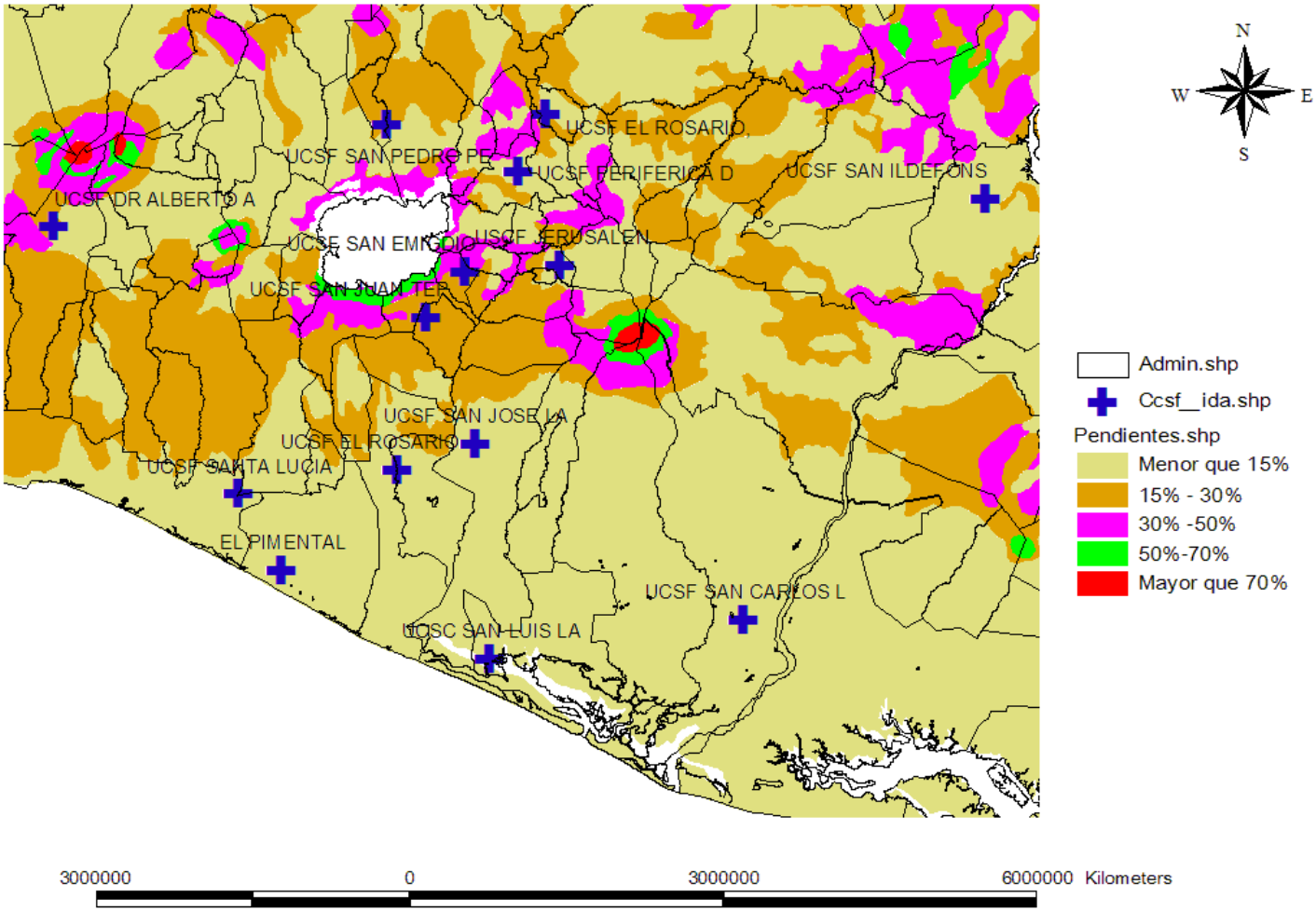


Image 33 Land use map; Source: MARN, Elaborated in-house

6.1.4. Susceptibility to landslides



6.2. Biological Environment

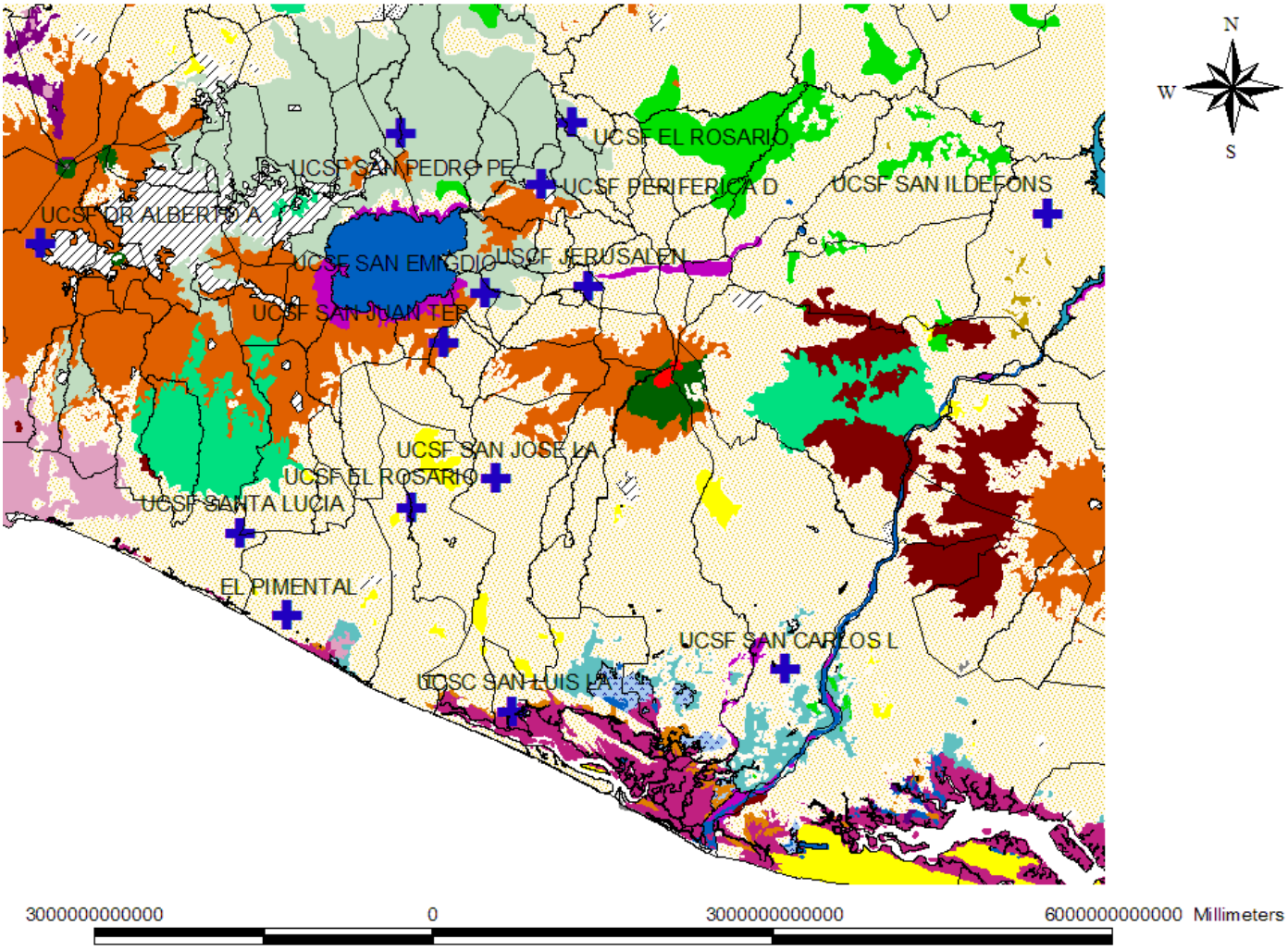


Image 34 Vegetation map; Source: MARN, Elaborated in-house

Admin.shp

Ccsf_ida.shp

Vegetacion.shp

Area Urbanizada

Areas de escasa vegetación sobre rocas, peñascos y coladas volcánicas (sucesión primaria)

Cuerpos de agua

Embalse

Formaciones acuáticas excepto las marinas, carrizales pantanosos y similares

Formaciones vegetales acuáticas excepto las marinas, dulce acuícola flotante

No interpretado

Roca desnuda, lava y bancos de arena

Sistemas productivos acuaticos (camaroneras o salineras)

Sistemas productivos con vegetacion leñosa natural o espontanea

Sistemas productivos mixtos

Vegetación abierta arbustiva predominantemente decidua en época seca (matorral y arbustal)

Vegetacion abierta predominantemente decidua con arboles y arbustos de costa o playa (marina o dulceacuícola) (zona ecotonal)

Vegetación abierta predominantemente siempre verde tropical submontana de coníferas

Vegetación abierta predominantemente siempre verde latifoliada esclerófila (chaparral)

Vegetación abierta principalmente siempre verde ombrófila tropical de arbustos (páramo)

Vegetación abierta, sabanas, campos y pastizales similares de tierras bajas y submontanas (morral)

Vegetación cerrada principalmente siempre verde tropical ombrófila submontana

Vegetación cerrada principalmente siempre verde tropical ombrófila montana nubosa

Vegetación cerrada principalmente siempre verde. Manglar

Vegetación cerrada principalmente verde riparia

Vegetación cerrada siempre verde tropical ombrófila estacionalmente saturada

Vegetación cerrada tropical decidua en estacion seca, de tierras bajas

Vegetación cerrada tropical ombrófila semidesidua de tierras bajas

Zonas de cultivos forestales y frutales

Zonas de cultivos o mezclas de sistemas productivos

Zonas de cultivos permanentes (cafetales)

Image 35 Symbols in Vegetation Map.

6.3. Gender

A situation of gender inequity is still prevalent in El Salvador. In rural areas, where this is more pronounced, women are often expected to devote their time to homecare activities without remuneration, to be dependent and to be submissive to men's decisions. (Universidad Nacional, 2010).

National statistics showing inequity can be seen in areas like Illiteracy (5.5% for men and 9.1% for women), average time devoted to domestic work (2.0 hours/day for men and 4.3 hours/day for women) and average wages ($260/month for men and $230/month for women). (DIGESTIC, 2007)

Processes to revert this situation intensified in the 1990's, with many efforts to create awareness and empower women made by UN Organizations, Cooperation Agencies, NGOs, the Government and other organizations (UNDP, 2004).

Results are being achieved, from the Government side, with the implementation of "Ciudad Mujer" Women Development Centers in La Libertad, San Salvador, Santa Ana and Usulután; however continuous participation of many more sectors is necessary for changes to take root at a cultural level.

7. Legal and environmental considerations

7.1. United States regulations

The Foreign Assistance act of 1961, as amended, Section 117 require that the impact of USAID´s activities on the environment be considered and that USAID include environmental sustainability as a central consideration in designing and carrying out its development programs. This mandate is codified in Federal Regulations (22 CFR 16) and in USAID´s Automated Directives System (ADS) Parts 201.5.10g and 204, which, in part, require that the potential environmental impacts of USAID-financed activities are identified prior to a final decision to proceed and that appropriate environmental safeguard are adopted for all activities.

7.2. El Salvador regulations

- ✓ Constitution of the Republic of El Salvador

According to Art. 1, "El Salvador recognizes the human person as the origin and objective of the activity of the State, which is organized towards the attainment justice, legal security and common welfare".

Consequently, it is the State's duty to guarantee that the inhabitants of the Republic enjoy freedom, health, culture, economic welfare and social justice".

According to Art. 117, "The protection, restoration, development and use of natural resources are declared as being of social interest. The State will create the economic incentives and will provide the necessary technical assistance for the development of adequate programs.

The protection, conservation and improvement of natural and environmental resources will be the subject of special laws".

According to Art. 119, "The construction of housing is declared as being of social interest. The State will make efforts so that the greatest number of families becomes the owners of their housing. It will promote that all owners of rustic farms provide hygienic and comfortable housing to resident workers, and adequate facilities for temporary workers. To that effect, it will facilitate the necessary means to small owners".

- ✓ Environmental Law (abbreviated LMA in Spanish)

The Environmental Law will be taken into account, as mentioned in Article 21, letter "L":

"CHAPTER V: ENVIRONMENTAL ASSESSMENT SYSTEM", referring to the activities, works or projects that require an environmental assessment: letter L, "Urbanization projects, constructions, developments or works that could provoke a negative environmental impact".

- ✓ Special Regulations of Technical Rules of Environmental Quality

This Executive Decree No. 40 of May 31, 2000, published in Official Gazette No. 63, Volume 346, develops the rules and precepts contained in the LMA.

Chapter III "Air Quality"; Section I Emissions from Fixed or Stationary sources, Art. 13, establishes that those responsible for activities, works or projects of those established in Art. 21 of the Law, that carry out construction, earth and road work, among others, susceptible to produce dust emissions, will apply the corrective measures established in the Environmental Permit to control dust emissions, in order to maintain in the zone the concentrations of total suspended particles within the limits established in the air quality standard (Art. 9).

What is established in Chapter IV related to Residual Waters (Art. 20 and 22) must also be taken into consideration.

- ✓ Special Regulations on the Integral Handling of Solid Waste

In Chapter I, “About storage”; Specifications for temporary storage, Art. 5.- In those cases where temporary collective storage locations for solid waste are established in residential buildings, they must comply, in a minimum grade, with the following specifications:

a) Temporary storage systems must provide for ease of cleaning and access;
b) Ventilation, water supply, drainage and fire control systems must be adequate;
c) The design must consider the restriction to the access of unauthorized persons and animals; and
d) The sites will be designed to facilitate the separation and recovery of materials with recycling potential.

Provisions related to containers, Art 6.- Containers for the temporary storage of solid waste must comply with the following minimum requirements:

a. Be adequately located and covered;
b. Have adequate capacity to store the volume of solid waste generated;
c. Be built with waterproof materials and with the necessary resistance for their end use;
d. Have adequate maintenance; and
e. Have identification related to the use and type of waste.

- ✓ Health Code

Referring to the social assistance of the Ministry of Public Health and Social Assistance: Responsibilities of professionals, technicians, ancillary personnel, hygienists and assistants in Art. 33, urban environmental sanitation and in Art. 56, drinking water (Art. 62), urbanization (Art. 96), sanitary fixtures (Art. 106). The resolution of MSPAS is shown in Annex No. 7.

- ✓ Municipal Code

In Title III, About Municipal Competence; Single Chapter, Art. 4, establishes that it is a duty of municipalities to watch over environmental sanitation, urban and rural development plans, solid

waste management, programs related to health and the fight against diseases, increase and protection of renewable resources (numbers 1, 5, 9 and 10).

8. Stages and main activities in each reconstruction project

The project construction process has typical activities grouped in three stages; a list follows with the main activities considered for the identification of significant impacts in a qualitative manner.

I. Site

- I.i. Drainage
- I.ii. Soil stability
- I.iii. Social security of the environment

II. Construction

- II.i. Clearing, weeding and demolition
- II.ii. Removal of vegetation
- II.iii. Temporary impact on basic services
- II.iv. Temporary disposal of clearing debris
- II.v. Excavation and land grading
- II.vi. Construction of works for drinking water supply, residual water and rain water
- II.vii. Repair and installation of electrical facilities

III. Operation

- III.i. Generation of residual water
- III.ii. Generation of common solid waste
- III.iii. Generation of bio-infectious waste
- III.iv. Use of circulation roads of access to every project

8. Assessment of potential impacts

Following are potential environmental impacts presented in three qualitative levels: 1 - Green, 2 – Yellow and 3 – Red:

- **1-Green**: Low impact. Within the context of this environmental assessment, this level means that the changes associated with anticipated activities, activity levels or processes will probably result in little or no effect on the quality of the human environment at the program level. These impacts do not require mitigation and are well within the standard, regulatory or policy limits for environmental protection.
- **2-Yellow**: Medium impact. This level means that the changes associated with activities, activity levels or processes will probably result in moderate adverse effects on the environment at the program level. These are short-term or low-intensity effects and do not

reach a significant level. Medium impacts do not create effects that exceed the standard, regulatory or policy limits for environmental protection.

- **3-Red:** High impact. Changes associated with activities, levels of activity or processes will likely result in adverse effects on the environment according to the conditions of each site. The level of these impacts depends on site conditions, as well as on intensity and duration of changes. These impacts exceed allowable limits of current environmental regulations.

The following tables show the rating of each project based upon the evaluation data identified previously in this report.

No.	Name	Main impacts and risks	Impact rating
1	Community Family Health Units (UCSF) Santa Lucía Orcoyo	Apparently, the immediate environment does not show evident environmental risks, with the exception of the threat of flows collected in the street during the rainy season.	2 - Yellow
2	Community Family Health Units (UCSF) El Pimental	The main risk in this project is the potential frequency of affectation by floods; the position with respect to the street, the presence of a channel within the premises that collects water from the property to the North, are the main local risk factors for this location. Since it is a low elevation flat zone, it is sensitive to floods of a larger scale due to the presence of the Comalapa River bet towards the North. Also towards the North are livestock farming facilities (barns), activity with a direct effect on the UCSF due to the production of excretions and/or due to the chemicals used in livestock farming.	2 - Yellow
3	Community Family Health Units (UCSF) San Pedro Perulapán	Due to its location, the land is perceived as being very vulnerable because of its position that even has up to 3.00 m of level difference, and semi-deep valley floors are located to the South due to the flow that they can collect, and the characteristics of the land can induce landslides. Within the premises are sectors where the soil is not consolidated and presents evident signs of erosion.	2 - Yellow

No.	Name	Main impacts and risks	Impact rating
4	Community Family Health Units (UCSF) Jerusalén	No evident environmental risks are identified; according to the information provided, during the rainy season, adjacent streets do not have adequate drainage and are flooded, the excess water is discharged in the land of the UCSF, flooding the whole garden area. This problem appeared during E-12. The strong flow of the nearby river does not affect the zone but interrupt transportation, isolating the population. The zone was not affected by the landslides from the volcano during hurricane Ida; however, the closeness of the Chinchontepec Volcano is always a risk. The collapse of the septic tank is reported.	2 - Yellow
5	Community Family Health Units (UCSF) Periférica de Cojutepeque	No environmental risks are evident for the land of the Health Unit; the visible risks are due mostly to the deterioration of the buildings, such as the collapse of a section of perimeter wall, and the water tank that threats to collapse and certain buildings (outside of the work area) are threatened by internal walls.	2 - Yellow
6	Community Family Health Units (UCSF) de San Juan Tepezontes	Throughout the municipality, the topography is very rough; the health unit is located at the center of a hill with buildings in the higher part with significant level differences. The cultural center is located towards the North of the land and towards the Northeast, the municipal office is building in several levels. Any failure of these buildings threatens the UCSF. Other risk sources are the strong runoffs, both in the land and in due to the steep slopes.	2 - Yellow
7	Community Family Health Units (UCSF) San José La Paz Arriba	No environmental risks are evident for the land of the Health Unit; the level difference with the eastern vicinity and with the road does not pose a problem. In the interview, users state that during the rainy season, the floors show presence of water seeping from the subsoil. It is assumed that there is a lower substrate with little filtration capacity that retains plenty of water, forming the swamp to the North and the presence of dampness in the floors.	2 - Yellow

No.	Name	Main impacts and risks	Impact rating
8	Community Family Health Units (UCSF) San Emigdio	No environmental risks are evident in the immediate vicinity which could affect the facilities of the UCSF. The problems reported refer to technical problems in the solution of rainwater downspouts with the vicinity of the Cultural Center.	2 - Yellow
9	Community Family Health Units (UCSF) El Rosario, Cuscatlán	According to what has been observed and to data provided by the principal, no environmental risks are evident; the environmental effects withstood by the buildings are related to the rainy season. Due to its rough topography, the land is susceptible to erosion and/or landslides.	2 - Yellow
10	Community Family Health Units (UCSF) San Carlos Lempa	The main risks for this project are the potential floods; the land is flat and is at road level. Since this is a very low and flat zone, it is sensitive to floods during prolonged rains. Towards the Southeast and adjacent to the land is a mobile telephone tower.	2 - Yellow
11	Community Family Health Units (UCSF) San Ildefonso	No evident environmental risks are identified; according to the information provided, risks are only present during the rainy season due to the damage to roofs, soil saturation or falling branches due to the wind.	2 - Yellow
12	Community Family Health Units (UCSF) La Herradura	The main risks for this project are the potential floods; the land is flat and is 30 cms. above street level. Since this is a very low and flat zone, the street collects large volumes of water, which enter the land. There are not records of floods due to high tides.	2 - Yellow
13	Community Family Health Units (UCSF) El Rosario, La Paz	The identifiable environmental risks refer specifically to zones South of the land which are prone to erosion and to the risks of falling branches on the roofs, provoked by rains and winds.	2 - Yellow

No.	Name	Main impacts and risks	Impact rating
14	Community Family Health Units (UCSF) Dr. Alberto Aguilar Rivas	No significant environmental risks are perceived within the site, but those provoked by rain, due to the bad condition of the drainage system of the UCSF and due to the density of trees, which provokes that branches fall frequently on the roofs, both during the rainy season and when there are strong winds.	2 - Yellow

9. Master Mitigation Identification Plan

Following is a description of mitigation measures for the priority group of projects, considering that the potential impacts are classified and identified as medium.

The typical sub-activities proposed, description of impacts and mitigation measures, are shown in the following table:

#	Sub – activity or component	Impact description	Mitigation Measures
1	**Component 1 – Location**		
1.1	Drainage	Facilities deteriorated due to lack of maintenance, generation of leaks and potential deterioration of the soil	Improvement or rehabilitation of rainwater management infrastructure, provision of basic drinking water, electricity and phone services; it must be guaranteed during construction and operation that materials and construction methods of the highest quality have been used, able to withstand new climatic events.
1.2	Slope management	Lack of stability of slopes, inside and outside of the project	Establishment of slopes with their respective surface runoff Works: channels, energy diffusers, shoulders and their re-vegetation. If shoulders are considered, their width must be a function of the number and/or height of the slopes to be established and the width of the withdrawal zones when slopes adjacent to the project are considered; the final design of slopes must be supported with specific technical surveys.
1.3	Social security of the environment	Danger due to the present of criminal groups outside of the facilities	Provision of fences and locks to secure sites.
1.4	Safety provisions	Inadequate drainage installations (mainly walkway gutters) generate high risk of falls and accidents for students	To prevent tripping hazards, rainwater drainages must be placed underground whenever possible. When exposed drainage gutters are necessary, they must be built with sufficient width and shallow depth. All open areas must be planted with grass.
2	**Component 2 - Construction**		
2.1	Cleaning and clearing	Generation of dust and noise from the use of machinery and equipment	Application of water irrigation to reduce dust at least three times a day.

#	Sub – activity or component	Impact description	Mitigation Measures
2.2	Earthworks and demolition	Generation of solid waste (excavation material, rubble, etc.)	For the management of common solid waste , clearing materials (clearing, rubble, etc.) and other solid waste to be generated during construction and operation, there must be an indication of the type of waste, volume to be generated, site authorized for disposal of the material (if required), environmentally feasible management proposal. Asbestos waste must have special management.
2.3	Use of machinery and equipment	Potential occupational lack of safety within the project and in its vicinity	Provision of personal protection equipment at the works, establishment of work schedules and road safety mechanisms on project access roads
2.4	Establishment of camp	Increase of personnel outside of the area of the Project, potential larger demand of services at the location	Provision of basic services for construction personnel without detriment to neighbors' living standards. Provisions and signaling for pedestrian-specific circulation zones. Site specific adaptation and follow-up of the **Community Involvement and Gender Plan** provided by CDM Smith. Relevant Health and Hygiene information must be available at all worksites, including information and prophylactics to prevent and control sexually transmitted diseases.
3	**Component 3 – Operation**		
3.1	Residual water management	Improper management of ordinary residual water (sewage and gray water)	In cases of management of sewage not connected to the existing network, an environmentally adequate proposal for their management must be submitted. It must include information related to the location, area to be used, capacity, technical specifications of the system, discharge sites, quality of effluent and of the water treated and foreseen maintenance, among others. Gray waters can be contaminated with pathogens, therefore they must be conducted along with sewage and the compounded effluent must be chlorinated before discharge to allow disinfection. Decontamination showers (for pesticide handling areas) must be provided with a specific trap with an exit valve to allow extraction of contaminated oils and to control discharge.

#	Sub – activity or component	Impact description	Mitigation Measures
3.2	Generation of solid waste	Improper management in the collection and final disposal of the solid waste generated during the operation could generate sources of pollution to the detriment of the health of users and neighboring population	Implementation of a comprehensive solid waste management program with support from the authorities of the UCSF, enabling the commercialization of the solid waste generated with companies authorized for its collection.
3.3	Generation of bio-infectious waste	Improper management in the collection and final disposal of bio-infectious waste generated by the operation of the activity could affect the health of users and of personnel working at the UCSF	Implementation of a comprehensive bio-infectious waste management program in every UCSF.
3.4	Cooking facilities	Usage of inefficient wood-based stoves generates air pollution due to inefficient combustion, economic impacts due to dependence on firewood, and promotes deforestation	Implementation of fan-assisted efficient wood-based stoves must be implemented (a local patent for “turbococinas” is available).

#	Sub – activity or component	Impact description	Mitigation Measures
3.5	Rainwater collection and usage	Lack of rainwater usage increases economic impacts due to higher potable water usage.	Collection of rainwater and usage in sanitary systems must be implemented. Collected rainwater must be filtered (using sand filters) to retain suspended solids from roofs. Since no potabilization processes are foreseen, filtered rainwater must be conducted separately from potable water to prevent human consumption and used exclusively in toilets.

10. Master evaluation, monitoring and environmental follow-up

#	Description of Mitigation Measures	Party Responsible	Monitoring methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring Date	Problems Found	Mitigation Effectiveness	
	Component 1 – Location									
1	Improvement or rehabilitation of rainwater management infrastructure, provision of basic drinking water, electricity and phone services; it must be guaranteed during construction and operation that materials and construction methods of the highest quality have been used, able to withstand new climatic events	CDM-GRAM	Incorporate into design	Graphic	Once		1			
							2			
							3			
							4			
2	Establishment of slopes with their respective surface runoff Works: channels, energy diffusers, shoulders and their re-vegetation. If shoulders are considered, their width must be a function of the number and/or height of the slopes to be established and the width of the withdrawal zones when slopes adjacent to the project are considered; the final design of slopes must be supported with specific technical surveys	CDM-GRAM	Incorporate into design	Graphic	Once		1			
							2			
							3			
							4			
3	Provision of security mechanisms in the vicinity of the facilities through adequate fences and locks.	CDM-GRAM	Incorporate into design	Graphic	Once		1			
							2			
							3			

#	Description of Mitigation Measures	Party Responsible	Monitoring methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring Date	Problems Found	Mitigation Effectiveness	
							4			
4	To prevent tripping hazards, rainwater drainages must be placed underground whenever possible. When exposed drainage gutters are necessary, they must be built with sufficient width and shallow depth. All open areas must be planted with grass.	CDM-GRAM	Incorporate into design	Graphic	Once		1			
							2			
							3			
							4			
	Component 2 - Construction									
1	Water irrigation to settle down the dust at least three times a day	MINSAL	Leasing of facilities to transfer students.	Visual	Once		1			
							2			
							3			
							4			
2	For the management of common solid waste , clearing materials (clearing, rubble, etc.) and other solid waste to be generated during construction and operation, there must be an indication of the type of waste, volume to be generated, site authorized for disposal of the material (if required), environmentally feasible management proposal. Asbestos waste must have special management	Contractor	Verification by CDM supervision	Visual	Weekly		1			
							2			
							3			
							4			
3	Provision of personal protection equipment at the works,	Contractor	Verification by CDM	Visual	Weekly		1			
							2			

#	Description of Mitigation Measures	Party Responsible	Monitoring methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring Date	Problems Found	Mitigation Effectiveness	
	establishment of work schedules and road safety mechanisms on project access roads		supervision				3			
							4			
4	Provision of basic services for construction personnel without detriment to neighbors' living standards. Provisions and signaling for pedestrian-specific circulation zones. Site specific adaptation and follow-up of the **Community Involvement and Gender Plan** provided by CDM Smith. Relevant Health and Hygiene information must be available at all worksites, including information and prophylactics to prevent and control sexually transmitted diseases.	Contractor	Verification by CDM supervision	Visual	Weekly		1			
							2			
							3			
							4			
	Component 3 - Operation									
1	In cases of management of sewage not connected to the existing network, an environmentally adequate proposal for their management must be submitted. It must include information related to the location, area to be used, capacity, technical specifications of the system, discharge sites, quality of effluent and of the water treated and foreseen maintenance, among others. Gray waters can be contaminated with pathogens, therefore they must be conducted	CDM	Verification by CDM	Visual	Monthly		1			
							2			
							3			
							4			

#	Description of Mitigation Measures	Party Responsible	Monitoring methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring Date	Problems Found	Mitigation Effectiveness	
	along with sewage and the compounded effluent must be chlorinated before discharge to allow disinfection. Decontamination showers (for pesticide handling areas) must be provided with a specific trap with an exit valve to allow extraction of contaminated oils and to control discharge.									
2	Implementation of a comprehensive solid waste management program with support from the authorities of the UCSF, enabling the commercialization of the solid waste generated with companies authorized for its collection.	MISAL and Municipal Offices	Verification by CDE and CDM (until the termination of the contract)	Visual	Monthly		1			
							2			
							3			
							4			
3	Implementation of a comprehensive bio-infectious waste management program in every UCSF	MISAL	Verification by CDE and CDM (until the termination of the contract)	Visual	Monthly		1			
							2			
							3			
							4			
3	Implementation of fan-assisted efficient wood-based stoves must be implemented (a local patent for “turbococinas” is available).	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			

#	Description of Mitigation Measures	Party Responsible	Monitoring methods			Estimated Cost	Results			Recommended adjustments
			Indicators	Method	Frequency		Monitoring Date	Problems Found	Mitigation Effectiveness	
							3			
							4			
4	Collection of rainwater and usage in sanitary systems must be implemented. Collected rainwater must be filtered (using sand filters) to retain suspended solids from roofs. Since no potabilization processes are foreseen, filtered rainwater must be conducted separately from potable water to prevent human consumption and used exclusively in toilets.	Contractor	Verification by CDM SMITH supervision	Visual	Weekly		1			
							2			
							3			
							4			

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