

# **ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

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JB de Guzman Farm and Poultry Supply – San Carlos  
Methane Recovery and Power Generation Project

Ref. No. 5979-0019

CPA-05 Methane Recovery and Combustion with Renewable Energy Generation from Anaerobic Animal  
Manure Management Systems under the Land Bank of the Philippines' Carbon Finance Support Facility

June 2019

## LIST OF ACRONYMS

BOD	Biological Oxygen Demand
CDM	Clean Development Mechanism
CFSF	Carbon Finance Support Facility
CMR	Compliance Monitoring Report
CSR	Corporate Social Responsibility
DENR	Department of Environment and Natural Resources
DNA	Designated National Authority
DO	Dissolved Oxygen
DOE	Designated Operational Entity
DP	Discharge Permit
ECC	Environmental Compliance Certificate
EMB	Environmental Management Bureau
EMF	Environmental Monitoring Fund
EPMD	Environmental Program and Management Department
ERPA	Emissions Reduction Purchase Agreement
ESMP	Environmental and Social Management Plan
ESSF	Environmental and Social Safeguards Framework
LBP	Land Bank of the Philippines
MOA	Memorandum of Agreement
MRF	Methane Recovery Facility
MSDS	Materials Safety Data Sheet
PCO	Pollution Control Officer
P.D.	Presidential Decree
PoA	Program of Activity
PPE	Personal Protective Equipment
PTO	Permit to Operate
R.A.	Republic Act
SMR	Self-Monitoring Report
SPA	Subproject Agreement
TSD	Treatment / Storage / Disposal
TSS	Total Suspended Solids
WTF	Water Treatment Facility

## TABLE OF CONTENTS

List of Acronyms	i
Table of Contents	ii
List of Tables	iii
List of Figures	iii
Appendices	iii
Purpose of the Document	iv
Scope	iv
<b>1. Project Summary</b>	<b>1</b>
1.1. Proponent Profile	1
1.2. Pig Farm Profile	2
1.3. Project Description	2
1.3.1. Components and Design	2
1.3.2. Operation	4
1.4. Existing Environmental Conditions in the Farm	5
1.4.1. Land Classification and Use	6
1.4.2. Climate	6
1.4.3. Topography and Soil	6
1.4.4. Water Resources	6
1.4.5. Natural Hazards	6
1.4.6. People and Communities	6
<b>2. Environmental Due Diligence</b>	<b>7</b>
2.1. Impact Assessment	7
2.1.1. Positive Impacts	7
2.1.2. Negative Impacts	7
2.2. Due Diligence	8
2.2.1. Legal Framework	8
2.2.2. Preventive and Mitigating Actions for Major Negative Impacts and Risks	9
2.2.3. Environmental Management and Monitoring Plan	10
2.2.4. Contingency Response	15
2.2.5. Occupational Health and Safety	15
2.2.6. Biosecurity	15
2.3. Monitoring, Auditing, and Reporting	16
<b>3. Social Due Diligence</b>	<b>17</b>
3.1. Consultation and Participation	17
3.2. Grievance Redress Mechanism	17
3.3. Information Disclosure	17
3.4. Equal Opportunity	18
3.5. Resettlement	18
3.6. Others	18
<b>4. ESMP Review and Updating</b>	<b>19</b>
<b>5. Institutional Arrangements</b>	<b>20</b>
5.1. The Proponent	20
5.2. LANDBANK	20
5.3. DENR	21
5.3.1. EMB	21
5.4. Municipal Government	21
5.5. World Bank	21
<b>6. Sub-Project Accountability</b>	<b>22</b>

## **LIST OF TABLES**

Table 1	Specifications of JB de Guzman Farm and Poultry Supply – San Carlos’ Wastewater Treatment Facility-Methane Recovery Facility
Table 2	Environmental documents and statutory requirements regulating the operation of JB de Guzman Farm and Poultry Supply – San Carlos
Table 3	Permits ensuring the safety of JB de Guzman Farm and Poultry Supply – San Carlos’ facilities and operation
Table 4	Environmental Management and Monitoring Plan of JB de Guzman Farm and Poultry Supply – San Carlos

## **LIST OF FIGURES**

Figure 1	Site layout of JB de Guzman Farm and Poultry Supply – San Carlos
Figure 2	WWTF of JB de Guzman Farm and Poultry Supply – San Carlos
Figure 3	Process flow of the methane recovery facility’s operation in JB de Guzman Farm and Poultry Supply –San Carlos
Figure 4	Map of Pangasinan showing the location of San Carlos City
Figure 5	Satellite Image of JB de Guzman Farm and Poultry Supply – San Carlos (highlighted in blue) and its Vicinity.

## **APPENDICES**

A	Digester Plans
B	Health and Safety Risks Management Plan of JB de Guzman Farm and Poultry Supply – San Carlos
C	Public Consultation Recods
D	Site Evacuation Plan



## **PURPOSE OF THE DOCUMENT**

This Environmental and Social Management Plan (ESMP) is prepared as part of the requirements of the Safeguards Framework for Clean Development Mechanism (CDM) projects implemented under the Carbon Finance Support Facility (CFSF) of the Land Bank of the Philippines (LBP). The Environmental and Social Safeguards Framework (ESSF) was developed to ensure the establishment of protection, compliance, and mitigation measures for relevant environmental and social aspects of projects under the CDM program which covers the Methane Recovery and Power Generation of JB de Guzman Farm and Poultry Supply – San Carlos.

### **Scope**

Since the Methane Recovery and Power Generation Project is a key component of JB de Guzman Farm and Poultry Supply – San Carlos' wastewater treatment facility (WWTF) – which handles the primary waste (manure) produced by its operations – this ESMP thus encompasses the operations of the entire farm described herein.

## 1 PROJECT SUMMARY

The Methane Recovery and Power Generation Project of JB de Guzman Farm and Poultry Supply – San Carlos owned by Mr. Joel B. de Guzman is an initiative developed under LANDBANK's CFSF. Its goal is to capture greenhouse gases, particularly methane from piggery wastewaters that would otherwise dissipate into the atmosphere, and convert them into electrical energy.

### 1.1 Proponent Profile

Proponent: Sps. Sandra and Joel de Guzman  
Business Address: Brgy. Naguilayan, San Carlos City, Pangasinan  
Owner: Mr. Joel B. de Guzman

Farm Name: JB de Guzman Farm and Poultry Supply – San  
Project Site: Brgy. Naguilayan, San Carlos City, Pangasinan  
Farm Coordinates: 15.959949, 120.341768  
Project Type: Livestock Project  
Philippine Standard  
Industrial Classification: 0145 - Hog Farming

Contact Persons **JB de Guzman Farm and Poultry Supply – San Carlos**  
Owner / Farm Manager / PCO:  
Mr. Joel B. de Guzman  
Tel. No.: 0917 327 7193  
PCO:  
Ms. Selina Jean V. de Guzman  
Tel. No.: 0917 327 7193

#### **LANDBANK**

Lending Programs  
Management Group: Emellie V. Tamayo  
Designation: Head / First Vice President  
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Environmental Program &  
Management Department: Prudencio E. Calado III  
Designation: Head / Assistant Vice President  
Telephone No.: (632) 405-7339  
Fax No.: (632) 528-8484

## 1.2 The Pig Farm

Farm area: 3.852 hectares  
Production: Farrow-to-Finish  
Housing type: tunnel ventilated

Capacity: 9,000 heads  
Average population: 8,595 heads

No. of Employees: 20  
Operating hours: 24

JB de Guzman Farm and Poultry Supply – San Carlos is a family-run business engaged in farrow-to-finish pig production. It is currently licensed to house a maximum of 9,000 heads as per its Environmental Compliance Certificate (ECC).

The farm is partially powered through the grid of the local power consessioaire, Central Pangasinan Electric Cooperative (CEPELCO), but now utilizes electricity from biogas through the project. Water for its operations is sourced from deep wells within the farm's property.



Figure 1. Site layout of JB de Guzman Farm and Poultry Supply – San Carlos

## 1.3 Project Description

The project covers the installation and operation of an anaerobic digester system and its ancillary facilities, including post-treatment wastewater lagoons and a biogas-powered electricity generation system, collectively referred to herein as methane recovery facilities (MRF).

### 1.3.1 Components and Design

JB de Guzman Farm and Poultry Supply – San Carlos' wastewater treatment process features three phases:

- *Pre-Treatment*, which involves the breaking down of relatively large digestible particles in wastewaters prior to entering the reactors;
- *Anaerobic digestion*, or the disintegration of biodegradable materials in the wastewaters through biological processes facilitated by microbes which thrive in the conditions promoted by the reactor; and
- *Post-Treatment* of biogas, effluent, and sludge resulting from anaerobic digestion.

In general, the WWTF is mainly composed of a collection tank, a covered concrete lagoon partitioned into two chambers, and an aerobic clarifying lagoon (see Image 1). The MRF basically consists of biogas generator sets.

Overall, the anaerobic digesters have been intended to accommodate wastes generated by up to maximum number of pigs the farm could house (9,000 heads) and capture enough biogas to run the project's facilities for a period of time per day. The design and layout of the WWTF are in the construction plans in Appendix A. Properties and specifications of the WWT-MRFs, including capacities, outputs, and efficiencies, will be detailed in the following version of this ESMP (see Section 4).

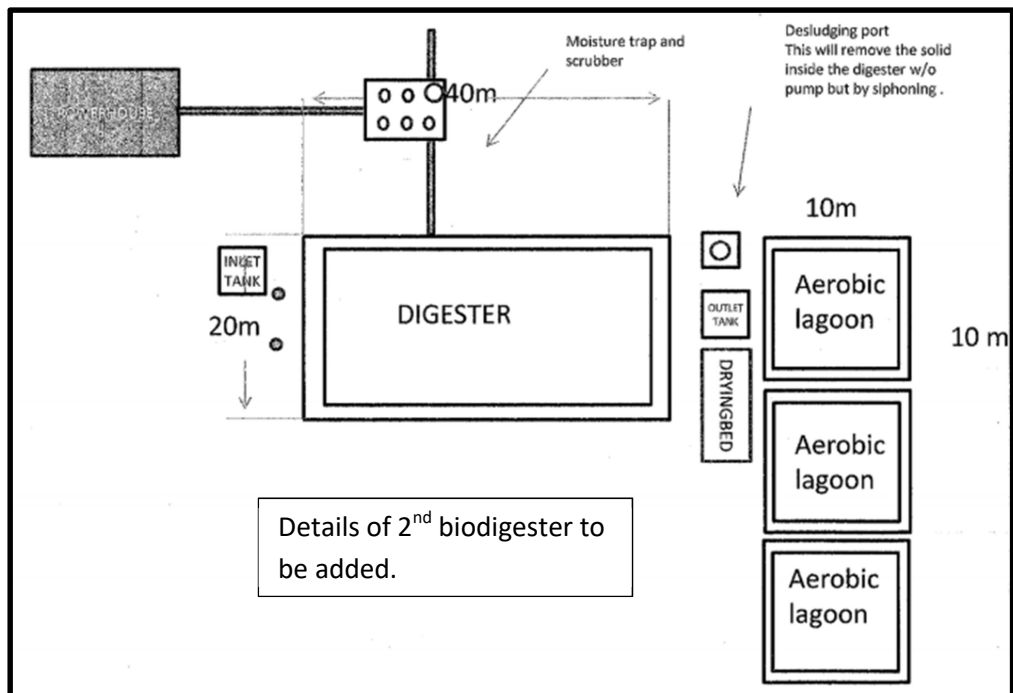


Figure 2. WWTF of JB de Guzman Farm and Poultry Supply – San Carlos

**Table 1.** Specifications of JB de Guzman Farm and Poultry Supply – San Carlos’ Wastewater Treatment Facility-Methane Recovery Facility

Phase	Process	Component	No. of Units	Description / Equipment
Pre-treatment	settling	pre-storage settling tank	1	-not specified-
	Collection and delivery	Wastewater canal line	20	6 in diameter HDPE solid pipes with tapered coupling
	Filtration	Sand trap system	3	2 m x 2 m concrete boxes
Anaerobic treatment	anaerobic digestion / fermentation	reactor	1	Earthen lagoon (60 m x 30 m x 4.5 m) 800 m <sup>2</sup> HDPE pond cover and liner
Post-treatment	Biogas	scrubber system	1	5 chambered scrubber system (steel barrels filled with charcoal)
		generator set	1	313 kVa, additional generator set for deliver
	Effluent	clarification (settling, aeration)	1	-not specified-
	Sludge	Sludge collection	1	HDPE solid piping system
		drying	1	-not specified-

### 1.3.2 Operation

Wastewaters flow from the pig sheds into the collecting tank which also serves as the biodigester’s inlet. Inside the chamber, wastewaters initially stay in the first compartment until they overflow onto the next, and then eventually out onto the clarifying lagoons (see Image). Wastewaters remain in the clarifying lagoons indefinitely. These lagoons are covered / surrounded with (aquatic) vegetation that helps further treat effluents.

Biogas produced in the anaerobic chambers are propelled through a gas pipes lined with moisture traps towards a generator set in which it is combusted to generate electricity used to power the farm.

Figure 1 illustrates the current processes involved and the project components employed in the wastewater treatment and power generation process in JB de Guzman Farm and Poultry Supply – San Carlos. A manual presenting a more detailed description of the WWTF-MRFs’ operations, including process times, flushing schedules, and water usage, will be prepared and appended to the succeeding version of this ESMP (see Section 4).

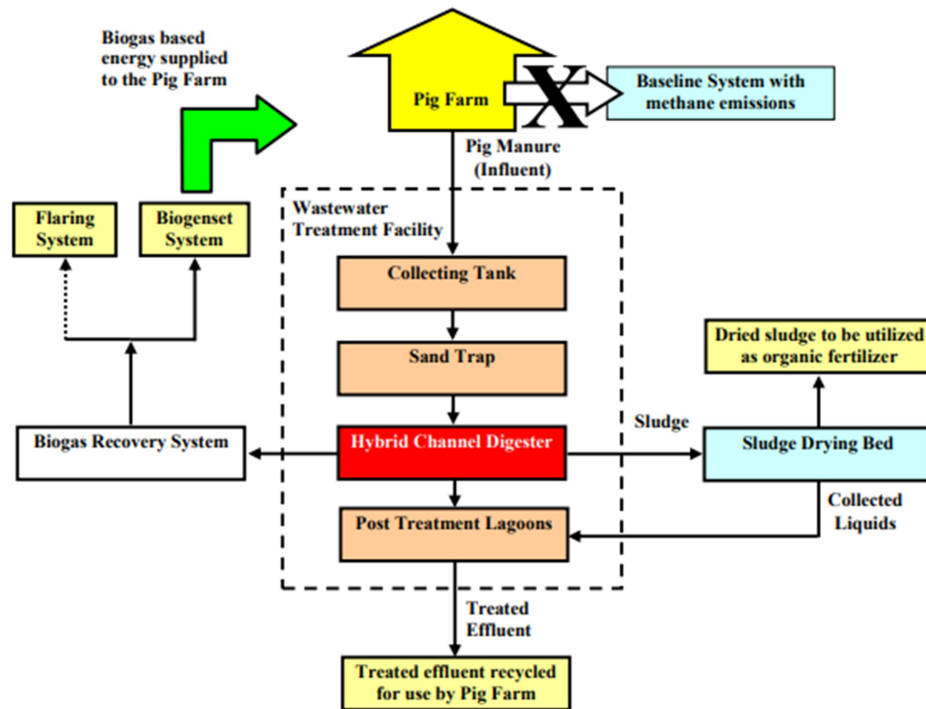


Figure 3. Process flow of the methane recovery facility's operation in JB de Guzman Farm and Poultry Supply –San Carlos

#### 1.4 Existing Environmental Conditions in the Farm / Project Site

JB de Guzman Farm and Poultry Supply – San Carlos is a 3.582 hectare property located in Brgy. Naguilayan, San Carlos City, Pangasinan.



Figure 4. Map of Pangasinan showing the location of San Carlos City

#### 1.4.1 Land Classification and Use

The project site is classified to be in an agro-industrial area.



Figure 5. Satellite Image of JB de Guzman Farm and Poultry Supply – San Carlos (highlighted in blue) and its Vicinity.

#### 1.4.2 Climate

San Carlos City is located in Pangasinan province and has a Tropical Savannah climate based on the K ö ppen-Geiger climate classification system. San Carlos City has an annual average temperature of 27.5 °C and an average rainfall of 2036 mm.

#### 1.4.3 Topography and Soil

According to the topographical map published by NAMRIA, the Farm sits on flat ground, primarily composed of rice fields and scrubland (<http://www.namria.gov.ph/3032-1SanCarlosCity.html>).

#### 1.4.4 Water Resources

No water bodies are present within the immediate vicinity of the farm.

#### 1.4.5 Natural Hazards

Based on the *Landslide and Flood Susceptibility Map of San Carlos Quadrangle, Pangasinan Province, Philippines* published by DENR-MGB, Barangay Naguilayan has low to moderate susceptibility to flooding.

#### 1.4.6 People and Communities

Low to medium density residential areas are located around the general vicinity (between 1 to 2 km) of the site.

## **2 ENVIRONMENTAL DUE DILIGENCE**

### **2.1 Impact Assessment**

#### **2.1.1 Positive Impacts**

JB de Guzman Farm and Poultry Supply – San Carlos provides employment opportunities to residents of San Carlos City. In addition to this, the farm also accepts students from local schools undergoing their on-the-job training (OJT) course.

The project was built to improve JB de Guzman Farm and Poultry Supply – San Carlos' method of handling and disposing pig manure and liquid waste. Compared to open lagoons, the biodigester has significantly amended the farms' wastewater treatment process, resulting in better effluent quality. Foul odors from effluents have also been greatly abated, improving the environment for both workers and livestock, as well as for surrounding communities. This is particularly important given the proximity of residential areas to the farm. Moreover, using biogas-generated electricity also reduces the farms' reliance on the grid (and on power from conventional fuels), translating to savings for the business.

By providing a mechanism to capture methane and use it as a source of energy, the project has lowered JB de Guzman Farm and Poultry Supply – San Carlos's overall carbon footprint. With inputs coming from a maximum of 9,000 hogs (maximum capacity), through the project, the farm is estimated to be capable of reducing greenhouse gas emissions equivalent to around 6,643 tCO<sub>2</sub>e for the entire duration of the project.

Finally, having been registered as a component project activity (CPA) in the CDM Program, JB de Guzman Farm and Poultry Supply – San Carlos has an opportunity to earn monetary incentives by selling carbon credits to World Bank. It may also opt to trade its carbon credits in the wider carbon market.

#### **2.1.2 Negative Impacts**

Certain aspects of the pig farms' and the project's operations inevitably result in potential harm to the environment, including generation wastewaters; hazardous and non-hazardous wastes; air pollutants; foul odors, noise, dust and other nuisance; and depletion of natural resources. These pose inherent risks to environmental quality and natural ecosystems and to health and safety of workers, communities, and livestock.



## 2.2 Due Diligence

JB de Guzman Farm and Poultry Supply – San Carlos commits to undertake environmental due diligence in its dealings and operations through compliance with relevant regulatory safeguards and implementation of the measures provided in the environmental management and monitoring plan in Table 3 and of other relevant provisions herein.

### 2.2.1 Legal Framework

JB de Guzman Farm and Poultry Supply – San Carlos operates in the context of laws prescribing the regulatory safeguards in Tables 1 and 2.

**Table 2.** Environmental documents and statutory requirements regulating the operation of JB de Guzman Farm and Poultry Supply – San Carlos

DOCUMENT	PARTICULARS	
Environmental Compliance Certificate (ECC)	Reference No.	ECC 010702-07 0026-0502 (3 <sup>rd</sup> Amendment)
	Issuing Agency	DENR-EMB Region I
	Date of Issuance	October 2, 2017
	Validity	- no expiration -
	Conditions	Area of operation: 3.852 hectares  • Maximum population: 9,000 heads
Discharge Permit (DP) for Water Pollution Source / Control Facilities	Reference No.	WWDP-14H-01PA47-065
	Issuing Agency	DENR-EMB Region I
	Date of Issuance	August 8, 2014
	Validity	August 7, 2019
	Conditions	Quarterly Monitoring  Wastewater Flow – 30.0 m <sup>3</sup> /day  • Class D Inland Waters standards
Permit to Operate (PTO) Air Pollution Source Control Installations	Reference No.	-For application-
	Issuing Agency	
	Date of Issuance	
	Valid Until	
	Conditions	
Hazardous Waste Generator ID	Registration No.	- For application -
	Approving Agency	
	Date of Approval	
	Valid Until	
	Conditions	
PCO (Pollution Control Officer) Accreditation Certificate	Accreditation No.	PCO1-05102017-2017 PCO1-05112017-2037
	Issuing Agency	DENR-EMB Region I
	Date of Issuance	May 10, 2017 May 11, 2017
	Validity	May 9, 2020 May 10, 2020

**Table 2.** Permits ensuring the safety of JB de Guzman Farm and Poultry Supply – San Carlos’ facilities and operation

DOCUMENT	PARTICULARS	
Business Permit	Permit No.	455-13
	Issuing Agency	Office of the City Mayor (San Carlos City)
	Date of Issuance	January 21, 2013
	Validity	None specified
	Prerequisites	<ul style="list-style-type: none"> <li>▪ Building Permit</li> <li>▪ Occupancy Permit</li> <li>▪ Zoning Clearance</li> <li>▪ Fire Clearance</li> <li>▪ Sanitary permit</li> </ul>
Zoning Clearance	Land Use Conversion Case No.	
	Approving Agency	
	Date of Approval	
Fire Clearance	Reference No.	
	Issuing Agency	
	Date of Issuance	
	Valid Until	
	Prerequisites	•
Sanitary Permit	Permit No.	
	Issuing Agency	
	Date of Issuance	
	Valid Until	
	Prerequisites	•

Copies of the permits and licenses in the lists and other relevant documents are in Appendix B.

### 2.2.2 Preventive and Mitigating Actions for Major Negative Impacts and Risks

#### *Wastewaters*

- ↪ Surfacewater contamination is prevented by treating all pig wastewaters in the WWTFs. The WWTF is kept in optimal working condition through regular inspection and maintenance activities. This ensures that effluents meet Class C quality standards set by EMB (Appendix C).
- ↪ Biodigesters have been constructed with durable materials.
- ↪ Rainwater drains separate from channels for wastewaters have been provided. During adverse weathers, the walls of wastewater lagoons are raised by promptly piling soil on their rims to prevent spillage.
- ↪ Risk of erosion in the site of the WWTF has been addressed by providing adequate slope protection during the construction of the biodigester.
- ↪ Technical specifications and actual performance of the WWTF-MRF will be determined to know the system’s efficiency. Information on these will enable the farm to optimize its operations and improve (or maintain) the WWTF-MRF’s performance.

#### *Hazardous Wastes*

- ↪ The farm will register as hazardous waste generator to be able to dispose through accredited TSD (transport, storage, disposal) providers.
- ↪ Currently, pig carcasses and potentially hazardous wastes are placed in a concrete vault.

#### *Odor*

- ▮ Treatment in the WWTF-MRF has significantly abated odors coming from effluents.
- ▮ Trees have been planted within and around the farm.
- ▮ The biogas collection system has been constructed with durable materials and is kept in good working condition through regular inspection and maintenance activities.

#### *Groundwater Depletion*

- ▮ Water conservation measures are being implemented in the farm.
- ▮ The farm will secure a Water Permit to comply with existing regulations and recompense for its consumption of groundwater.

### **2.2.3 Environmental Management and Monitoring Plan**

Table 3 summarizes the measures intended to address the environmental impacts and risks identified in Section 2.1.2. Adequate training will be given to concerned employees to ensure that the content of this environmental management plan will be properly carried out.

**Table 4.** Environmental Management and Monitoring Plan of JB de Guzman Farm and Poultry Supply – San Carlos

IMPACT	SOURCE / ACTIVITY	MEASURES	STATUS			MONITORING METHOD	FREQUENCY	PARAMETER / INDICATOR	RESPONSIBLE ENTITY	REPORTING TO	Cost, Php
			Existing / Current Practice	For Implementation / Under Construction	Adoption Under Review						
A. Wastewater											
a.1 generation of wastewater	pig raising	water conservation strategies	✓			quantify wastewater production	monthly	volume of wastewater produced	Farm pesronnel	PCO	-
		treatment of wastewater in WWTF	✓								
a.2 generation of domestic wastewater	general farm activities	water conservation strategies	✓			check siphoning and hauling records	every 5 years	volume of sewage hauled	Farm personnel	PCO, Farm manager	Php 33,000 maintenane costs
		sewage septic tanks	✓								
		sewage disposal in treatment plants	✓								
B. Solid Waste											
b.1 generation of manure, sludge	pig raising, feed wastage, WTF	minimize feed wastage	✓			quantify (dried) sludge produced	annually	amount of sludge produced	Farm personnel	PCO, Farm manager	Php 15,000 per feeder
		- automated feeding system;									
		- regular inspection and maintenance of feed delivery system									
		treatment of manure in WWTF									
		sludge used as soil conditioner	✓								
b.2 generation of (non-infectious) carcasses, blood	injuries, adverse environmental conditions, etc.	observe sound pig raising practices and biosecurity measures	✓			weigh disposed materials	daily	weight of materials disposed	Farm personnel	PCO	Php 300 daily wage for maintenance workers
		regular inspection and preventive maintenance of equipment regulating pig environment	✓								
		carcass disposal burial; composting is being considered	✓								
b.3 generation of general solid wastes	general farm activities	waste segregation	✓			weigh solid wastes disposed of (recyclables and residuals)	every hauling	weight / details on wastes generated, stored, and disposed of	Farm personnel	PCO	Php 300 daily wage for maintenance workers
		provides adequate collection bins, storage area in strategic locations	✓								
		reduce, reuse, recycle / selling of recyclables	✓								
C. Hazardous Materials											
c.1 generation of hazardous, toxic wastes	facilities' operation and maintenance	monitor resource usage to avoid expiration of chemicals, etc.	✓			quantify each type of hazardous waste produced / stored and disposed of (check hazardous waste manifests)	every hauling and disposal	quantity of each hazardous waste type stored and disposed	Farm pesronnel	PCO, Farm manager	Hauling costs
		disposal through accredited TSD	✓								
		reusing, recycling certain materials (for various construction and maintenance activities)	✓								
c.2 generation of infectious, pathological wastes, carcasses	veterinary activities, infections, outbreaks	carcass disposal through burial; composting is being considered	✓								
		pathological / innfectious materials disposed in concrete septic vault	✓								
D. Air Pollution											
d.1 generation of biogas	anaerobic digestion	capturing through biodigesters and combustion using biogas-fueled engine	✓			record electric meter reading of biogas gensets	Daily	kWh produced	Farm pesronnel	Farm manager	Php 300 daily wage for maintenane workers
d.2 generation of air pollutants	vehicles, stand-by generator sets (fossil fuel combustion)	operate machineries according to manufacturer's instruction	✓			review inspection and maintenance record	monthly	number and details of machinery issues noted	Farm pesronnel	PCO	Php 33,000 maintenance costs
		use of diesel with low sulfur content	✓			emission testing	annually or every 5 years	emissions standards			
		regular inspection and preventive maintenance of equipment	✓								
E. Risk of Environmental Degradation											
e.1 (risk of) surface	e.1.1 wastewater	operates WWTF as prescribed	✓			effluent sampling and testing by an	quarterly	effluent quality	Farm pesronnel	Farm Manager,	Php 33,000

water and groundwater quality degradation, disruption of soil properties, contamination	collection, transport, treatment, disposal	regular inspection and preventive maintenance of WWTF; regular desludging	✓			EMB-accredited laboratory	- more frequently during rainy seasons	indicators: BOD, TSS, ammonia, phosphate (must meet standards for Class C effluent)		PCO	maintenance costs
		maintainance of vegetation (filter strips) around lagoons	✓								
		ensures effluents meet EMB standards^	✓								
	e.1.2 sludge management, storage, leachate	drying of sludge and using it as soil amendment	✓			review inspection and maintenance record	monthly - more frequent during rainy seasons	number and details of leak / breach incidents	Farm personnel	PCO	Php 300 daily wage for maintenanc workers
		regular inspection and preventive maintenance of drying bed	✓								
		maintainance of vegetation (filter strips) around drying bed	✓								
	e.1.3 pathological wastes, carcass disposal, leachate	establish vegetative filter strips around disposal site	✓			review inspection and maintenance record	monthly - more frequent during rainy season	number and details of leak / breach incidents	Farm personnel / haulers	PCO	Php 300 daily wage for maintenanc workers
	e.1.4 handling, transport, storage, disposal of hazardous and infectious materials	uses materials according to registered use / manufacturer's instruction	✓			review inspection and maintenance record	weekly	number and details of leak / breach incidents	Farm personnel	Farm manager, PCO	Construction costs for storage areas
		use of suitable containers with labels	✓								
		provides secured collection and storage area	✓								
		regular inspection of storage, disposal facilities	✓								
		will make MSDS available on-site of use		✓							
		will develop and observe safety protocols		✓							
		will install appropriate signage, warnings		✓							
		will provide spill kits on storage areas		✓							
		will prepare a contingency response plan		✓							
		will provide adequate training to staff on handling of hazardous materials		✓							
	e.2 (risk of) pollution from fugitive biogas	biogas collection, storage, combustion	operates MRF as prescribed	✓			review inspection and maintenance record	monthly	number and details of leak / breach incidents (odor detection)	Farm personnel	PCO
		regular inspection (leak test) and preventive maintenance of MRF	✓								
F. Health and Safety – Anaerobic Digester System											
			✓								
			✓								
			✓								
			✓								
			✓								
G. Health and Safety – General Farm Operations											
f.1 odor - nuisance, discomfort, health issues	f.1.1 pig houses, manure	regular cleaning of pig houses and flushing of drains	✓	✓		review complaints register	every two weeks - more frequent during typhoon (windy) season	number and details of odor complaints	Farm personnel	Farm manager	PPE costs  Php 300 daily wage for maintenance workers
		tunnel ventilated buildings	✓	✓							
		maintains existing vegetation, will plant trees	✓	✓							
		provision and use of appropriate PPE	✓	✓							
	f.1.2 WTF, effluent, MRF	gas trapping and combustion through MRF	✓	✓							
		will ensure adequate retention time of wastewaters in the biodigester is achieved	✓	✓							
		regular inspection and preventive maintenance of WWTF-MRF	✓	✓							
		prevent overtopping, spillage (see e.1.1)	✓	✓							
		provision and use of appropriate PPE	✓	✓							
		ensure sludge pile is well aerated, prevent waterlogging	✓	✓							
f.1.3 decomposing materials (sludge and organic	provision and use of appropriate PPE	✓	✓								

	solids)									
	f.1.4	disposal through burial, composting	✓	✓						
	decomposing materials (placental materials and carcasses)	prevent leakage of leachate in disposal sites (see e.1.3)	✓	✓						
		provision and use of appropriate PPE	✓							
f.2 noise - nuisance, discomfort	f.2.1 pigs	automated feeding system	✓			review complaints register	monthly	number and details of noise complaint	Farm pesronnel	PPE Costs
		provision and use of appropriate PPE	✓							
		Maintains existing vegetation, will plant trees	✓							Php 15,000 per feeder
	f.2.2 vehicles, machineries	operate equipment, machineries according to manufacturer's instruction	✓							
		regular inspection and preventive maintenance of machineries	✓							
		generator sets are fitted with mufflers	✓							
		provision and use of appropriate PPE	✓							
f.3 dust - nuisance, discomfort, health issues	f.2.1 pig houses, feed handling	limits dust-generating activities during day time, low wind movement (as much as it is practical)	✓			review complaints register	quarterly - more frequent during typhoon (windy) season	number and details of dust complaints	Farm pesronnel, admin officers	PPE costs
		tunnel ventilation systnem prevents dust buid up	✓							
	f.2.2 composting areas, dried compost handling	use of appropriate containers, barriers	✓							
		damping of dried materials	✓							
		limit dust-generating activities during day time and low wind movement (as much as it is practical)	✓							
		provision and use of appropriate PPE	✓							
	f.2.3 vehicles, machineries	sealing and damping of unpaved roads	✓							
		limits vehiculular speed on unsealed roads	✓							
		operates feedmill in an enclosed area	✓							
		limit dust-generating activities during day time, low wind movement (as much as it is practical)	✓							
		provision and use of appropriate PPE	✓							
f.4 pest and vermin proliferation / infestation - nuisance, health issues	decomposing materials and sources of odors	implement odor control measures (see f.1)	✓			review inspection results records and complaints register	monthly - more frequent during rainy season	number and details of incidents, complaints	Farm personnel	Php 50,000 per year for vermin/pest control
		imlement pest, vermin control measures (use of baits and traps)	✓							
		observes good houskeeping practices	✓							
		regular inspection of farm facilities, surroundings	✓							
f.5 health hazards, (risk of) contracting infectious diseases, sustaining injuries, livestock outbreak	handling, transport, storage of hazardous and infectious materials, movement of carrier pests and vermin, handling of ill pigs	adequate training on handling of hazardous, infectious materials	✓			review incident reports, inspection records and complaints register, results of employees' regular health checks	monthly	number and details of illness, injury incidents, complaints	Farm pesronnel	Php 350 daiy wage for technical pesronnel
		provision and use of appropriate equipment for handling and storage of hazardous and infectious materials	✓							Equipment costs
		enforce, observe biosecurity measures, health and safety protocols	✓							Php 50,000 per year for vermin/pest control
		observe measures for safe handling of hazardous and infectious materials (see e.1.3 & e.1.4)	✓							
		implement pest and vermin control measures (see f.4)	✓							
		regular inspection of farm facilities, surroundings	✓							
f.6 explosion, fire hazard	biogas collection, storage, combustion	WWTF-MRF constructed with durable materials	✓			review inspection and maintenance records, incident reports, complaints register	monthly	number and details of explosion, fire incidents	Farm personnel	Php 350 daiy wage for technical pesronnel
		operates WWTF-MRF according to design	✓							
		regular monitoring of pressure within the MRF system	✓							
		regular inspection (leak test) and preventive maintenance of MRF	✓							
		restricts access to MRF	✓							Signage printing costs
		prohibits ignition sources (smoking) near MRF		✓						
		will install signage and warnings		✓						

		reporting and recording of explosion, fire incidents		✓							
f.7 drowning hazard	open ponds, lagoons, tanks	restrict access to WTF, install fences		✓		review incident reports	monthly	number and details of drowning incidents	Farm pesronnel	PCO	Php 350 daily wage for technical personnel
		install signage and warnings		✓							
		reporting and recording of drowning incidents		✓							
f.8 freshwater depletion	pig raising and general farm activities	water conservation strategies	✓			quantify volume of freshwater consumption	monthly	volume of freshwater consumed	Farm personnel	Farm manager	-
		effluent recycling	✓								
f.9 consumption of non-renewable resource (fossil fuels for power)	pig raising and general farm activities	energy conservation strategies	✓			estimate power consumption from billing for electricity	monthly	kWh consumed	Farm personnel	PCO	-
		use of energy-efficient equipment	✓								
		uses electricity generated using biogas	✓								
		pig buildings have concrete walls and roofing, providing efficient insulation against ambient heat	✓								
		thermostat controlled cooling system have auto shut off feature	✓								
f.11 (risk of) erosion	rainwater runoff	plant various tree species and vegetation along roads and slopes	✓			review inspection records	monthly - more frequent during rainy season	number and details of erosion incidents	Farm personnel	Farm manager	Php 300 daily wage for maintenance workers

BOD Biological Oxygen Demand
MSDS Materials Safety Data Sheet
PCO Pollution Control Officer
PPE Personal Protective Equipment

SMR Self-Monitoring Report
TSS Total Suspended Solids

The Environmental Management and Monitoring Plan of JB de Guzman Farm and Poultry Supply – San Carlos will be updated to reflect the cost of implementing the same. It will be presented in the succeeding version of this ESMP.

#### **2.2.4 Contingency Response**

Below is an overview of JB de Guzman Farm and Poultry Supply – San Carlos' current preparation and action plan in response to the following:

- a. Fire
  - Fire extinguishers are available at strategic locations around the farm. Pig houses are also equipped with water taps and sprinklers from which water for putting out fire can be sourced.
- b. Earthquake
  - The open grounds inside the farm are designated as evacuation areas for when an earthquake occurs.
- c. Outbreak
  - In the event of a livestock outbreak, quarantine measures are instinctively applied. Movement of humans and animals in and out of the farm is restricted and instructions from the farm's consultant veterinarian are carried out.
- d. Power outage
  - Should there be power interruption, a diesel-fueled standby generator is able to supply the farm's electricity needs, in addition to the biogas genset.
- e. Health emergencies
  - First aid kits are readily available on site for minor injuries. Farm personnel also have access to vehicles which can be used for transporting cases needing more advanced medical care.

In the interim, JB de Guzman Farm and Poultry Supply – San Carlos hereby commits to develop a more comprehensive contingency preparedness and response plan that will address incidents of fire; natural hazards (typhoon, earthquake); outbreak; health emergencies; and environmental emergencies (leaks and spills of wastewaters and hazardous wastes, WWTF-MRF system breakdowns). This plan will be appended in the succeeding version of this ESMP.

#### **2.2.5 Occupational Health and Safety**

In addition to the health and safety measures presented in Table 3, JB de Guzman Farm and Poultry Supply – San Carlos will develop a more comprehensive health and safety risk management plan which will deal with general occupational health and safety issues associated with work in the farm. Health complaints and accidents will be recorded in a register and will serve as indicators of the plans effectiveness, together with results of workers' annual health check-ups. This plan will be appended in the succeeding version of this ESMP.

#### **2.2.6 Biosecurity**

The particulars of the farms' biosecurity protocol will be appended in the succeeding version of this ESMP.



### 2.3 **Monitoring, Reporting and Auditing**

The proponent will perform the monitoring plan in Table 3 and conduct regular inspection of its facilities not only for internal purposes but also to satisfy the requirements of the Environmental Management Bureau (EMB) for periodic self-monitoring reports (SMR). In addition, assessments will also be initiated during or immediately after incidents that may have compromised the integrity of the farm's facilities, especially the WWTF-MRF, and caused the release of pollutants in the environment. A registry of such incidents and other environmental emergencies and accidents will be maintained in the farm and its details reported in the SMR.

The SMR will contain the results of audits on the farm's environmental performance in terms of resource utilization, waste management, regulatory compliance, and fulfillment of environmental commitments among others. This document will be tendered to EMB quarterly. LBP-EPMD (Environmental Program and Management Department) will also be provided with copies of this document for reference and review purposes.

The owner and the farm's Pollution Control Officers (PCO), Mr. Joel B. de Guzman and Ms. Selina Jean de Guzman, have been tasked to ensure that the farm is compliant with pertinent environmental regulations, including those listed in Table 3, and is performing its environmental commitments, including the implementation of this ESMP.

During the implementation of the CDM Program, LBP-EPMD will conduct monitoring activities in the farm at least twice a year to help the proponent execute, identify gaps in, and improve and update this management plan.

### 3 SOCIAL DUE DILIGENCE

#### 3.1 Consultation and Participation

Prior to construction, the Proponent, together with LBP-EPMD, has identified the stakeholders of the Project. Through letters and notices posted on / displayed in the farm's perimeters and other public spaces, the stakeholders were invited to the consultation for the Project's establishment held in J.B. de Guzman Farm, Brgy. Naguilayan, San Carlos City, Pangasinan, on August 5, 2015 (8:30 AM to 11:15 AM). A total of 39 people from various institutions, including residents of communities near the project site, have attended.

#### 3.2 Grievance Redress Mechanism

The Farm's manager and PCO, Mr. Joel B. de Guzman and Ms. Selina Jean de Guzman, are hereby designated to be the main contact persons for stakeholders regarding grievances, feedbacks, and queries related to the Project. They are also to be in charge of ensuring that the details of complaints and the actions made to address the same will be recorded truthfully. Such information shall be part of the regular monitoring report for the Project and will be made available to relevant stakeholders.

The proponent will make every effort to settle any concern at the project level. Should his attempts be unsuccessful, issues will be raised to the following third party institutions for arbitration and possible resolution:

- Office of the Barangay Chairman  
Complaints shall be entertained in the *barangay* where the Farm is situated. The *barangay* office concerned will facilitate the negotiation process and LBP-EPMD will ensure that the complainant is properly represented.
- Municipal Office  
Should no agreement be reached at the *barangay* level, the matter will be elevated to a municipal government office. Depending on the nature of the complaint, grievances may be addressed to the Municipal Health Office, Agriculturist Office, Environment and Natural Resources Office, or other relevant municipal agency.
- LBP  
LBP through EPMD will take part on the resolution process only after the aggravated party has gone through the previous levels and finds the decisions rendered there unacceptable. EPMD will coordinate with the Proponent to ensure that issues regarding the latter's project are resolved to the best interest of the complainant.

To further ensure the proponent's accountability, contact details of the farm's management and LBP-EPMD shall be provided to stakeholders during consultations and through postings at public notice boards (in Barangay Naguilayan's community hall), including at the farm's main gate. For this project, the following individuals will serve as grievance administrators:

- Prudencio E. Calado III  
Head/Assistant Vice President, LBP-EPMD  
Telephone No.: (632) 405-7339  
Fax No.: (632) 528-8484
- Mr. Joel B. de Guzem  
Farm Manager / PCO, JB de Guzman Farm and Poultry Supply – San Carlos  
Telephone No.: (63) 917 5801866

#### 3.3 Information Disclosure

This ESMP and other relevant information regarding the Project will be published in LANDBANKS's website where it can be readily accessed by the public. Printed copies of this document will be submitted to EMB Region 1 and will also be available in Barangay Naguilayan's

office, in LANDBANK's library (1598 M.H. Del Pilar cor Dr. J. Quintos St., Malate, Manila, Philippines), and in the World Bank InfoShop.

#### 3.4 **Equal Opportunity**

JB de Guzman Farm and Poultry Supply - San Carlos is an equal opportunity employer, not regarding gender, age, disability, and ethnicity in evaluating and hiring potential employees. Presently, the Farm's roster consists of 35 employees (25 male and 10 female) Most of the male workers are assigned to maintain the facilities and pig houses, and have pig handling responsibilities. Females are primarily involved in veterinary and farrowing activities.

#### 3.5 **Resettlement**

The project is located inside the premises of JB de Guzman Farm and Poultry Supply – San Carlos, a private property. No individual was displaced for nor were there any indigenous peoples affected by the establishment of the farm and the project.

#### 3.6 **Others**

Employees of JB de Guzman Farm and Poultry Supply – San Carlos receive standard basic salary at the minimum, 13th month pay, and other regular statutory benefits, in addition to free meals and incentives.

The farm partners with different schools and accommodates students for their on-the-job training.

#### **4 ESMP REVIEW AND UPDATING**

This ESMP shall be reviewed annually and will be updated subject to the results of the semiannual monitoring activities conducted by J.B. San Carlos and LBP-EPMD. Reviews may be done more frequently or earlier than schedule, especially after events resulting in significant adverse effect to the environment.

In the first updated version of this ESMP, which will be published in the last quarter of this year (2019), the following information and documents will be provided:

- properties, specifications, and performance parameters of the WWT-MRFs;
- WWTF-MRF Operations Manual;
- cost of implementing the Environmental Management and Monitoring Plan;
- Contingency Preparedness and Response Plan; and
- Health and Safety Risk Management Plan
- Biosecurity protocol

## **5 INSTITUTIONAL ARRANGEMENTS**

### **5.1 The Proponent**

The proponent, Mr. Joel B. de Guzman, will be responsible in all the aspects of the project, including the implementation of this ESMP. He will shoulder all costs associated with the construction and operation of the project, internal monitoring activities, and meeting various statutory requirements. Specifically, he shall / he shall cause the accomplishment of the following:

- exercise environmental and social due diligence in implementing the project
- incorporate sound practices in environmental, health, and safety management
- comply with relevant national and local laws and satisfy regulatory obligations
- perform diligent environmental and system monitoring
- prepare and submit on schedule accurate monitoring reports to EMB and LBP
- cooperate with the LBP and other regulatory agencies by providing assistance and correct and relevant information regarding the project and its environmental performance for reference, review, and monitoring purposes
- promote transparency by maintaining open lines of communication with project stakeholders and giving them access to relevant information
- initiate resolution of conflicts that may arise as a result of the project's operation

The proponent, in close coordination with LBP, shall implement the project based on LBP's ESSF and on the agreed activities and timelines stipulated in the memorandum of agreement (MOA) and subproject agreement (SPA) between the said entities.

### **5.2 LANDBANK**

LBP shall serve as the financial and technical intermediary for the CDM Program of Activity (PoA) under which the project of JB de Guzman Farm and Poultry Supply – San Carlos is being implemented. It shall provide the proponent carbon and investment finance assistance for the installation of an anaerobic wastewater treatment facility equipped with a biodigester and methane-fueled power generator. Moreover, it shall act as the entity in charge of project validation and verification activities, and of collation of relevant information and monitoring data for the undertakings mentioned. Specifically, LANDBANK, through EPMD, shall:

- make available financing facilities to the proponent, subject to existing lending policies of LBP
- coordinate and facilitate communications and transactions between the proponent and World Bank or other carbon buyers, Designated Operational Entity, and when necessary, with other project partners
- administer the agreements (MOA, SPA) forged between LBP and the Proponent
- provide technical support and relevant trainings to farm owners and personnel in partnership with other institutions
- ensure compliance of the Project and its proponent with the rules governing PoAs and with its commitments in the MOA and SPA
- ensure compliance of the Project and its proponent with relevant standards and regulations and environmental commitments by conducting onsite monitoring and evaluation and desk reviews
- provide assistance to the proponent in complying with statutory requirements for the project
- ensure the project's sustainability by monitoring the long-term implementation of the safeguards specified in this ESMP and its environmental performance in general
- gather, collate, and review pertinent information and documents (including safeguard instruments, reports, and permits and clearances) concerning the project
- participate in conflict resolution initiated by the proponent
- prepare and submit monitoring reports to World Bank regularly
- satisfy its obligations under the Emissions Reduction Purchase Agreement between LBP and World Bank

LBP shall assist the proponent in its implementation of the project in accordance with LBP's Safeguards Framework and the agreed activities and timelines stipulated in the MOA and SPA.

### **5.3 Department of Environment and Natural Resources**

The Department of Environment and Natural Resources (DENR) is the primary government institution mandated to manage and protect the Philippines' environment and natural resources. It is also the Designated National Authority (DNA) of the CDM Program in the Philippines. As DNA, its main role is to review and endorse PoAs to the United Nations Framework Convention on Climate Change.

#### **5.3.1 Environmental Management Bureau**

Through the EMB, DENR sanctions and regulates the activities of the Project by means of various legal instruments. EMB also leads (whether or not as part of a Multi-partite Monitoring Team) the periodic monitoring of the Project's compliance and impacts, including the fulfillment of the commitments stated in this ESMP. Prior to construction, EMB was the agency tasked to review and evaluate the environmental soundness of the Project and authorize its establishment through the issuance of an Environmental Compliance Certificate.

### **5.4 Municipal Government**

The local government unit of San Carlos City licenses the operation of JB de Guzman Farm and Poultry Supply – San Carlos through the issuance of a business permit. This permit is only given to businesses after satisfying its prerequisites – building and occupancy permits, zoning clearance, sanitary permit, fire clearance – all of which are also issued by the city government.

Agencies and offices under the government San Carlos City, will also, if necessary, lead / facilitate the resolution of complaints arising from the farm and project's operations.

### **5.5 World Bank**

The World Bank is the main Carbon Buyer of the Project, but will also serve as an advisor to LPB in carrying out the latter's responsibilities as the coordinating and managing entity for CDM projects. The Bank will conduct regular monitoring, audits, and appraisals on the Project's safeguards performance against its established policies, as well as provide technical guidance to LBP and to the Proponent.

## **6 SUB-PROJECT ACCOUNTABILITY**

In line with Section 3.02 on Sub-Project Development and Operation by the Sub-Project Entity, Item (q) of the Sub-Project Purchase Agreement (SPA) signed by the Farm Management, the Sub-Project Entity (Farm Management) agrees and undertakes to:

- (q) implement and operate the Sub-Project in compliance with the World bank Operational Policies, including without limitation and as applicable, the Environmental Management Plan, Resettlement Plan, Indigenous Peoples Plan, and any other requirement resulting from the application of the World Bank Operational Policies.

Having signed the SPA, the Farm Management is accountable to comply with the commitments stated in this document.

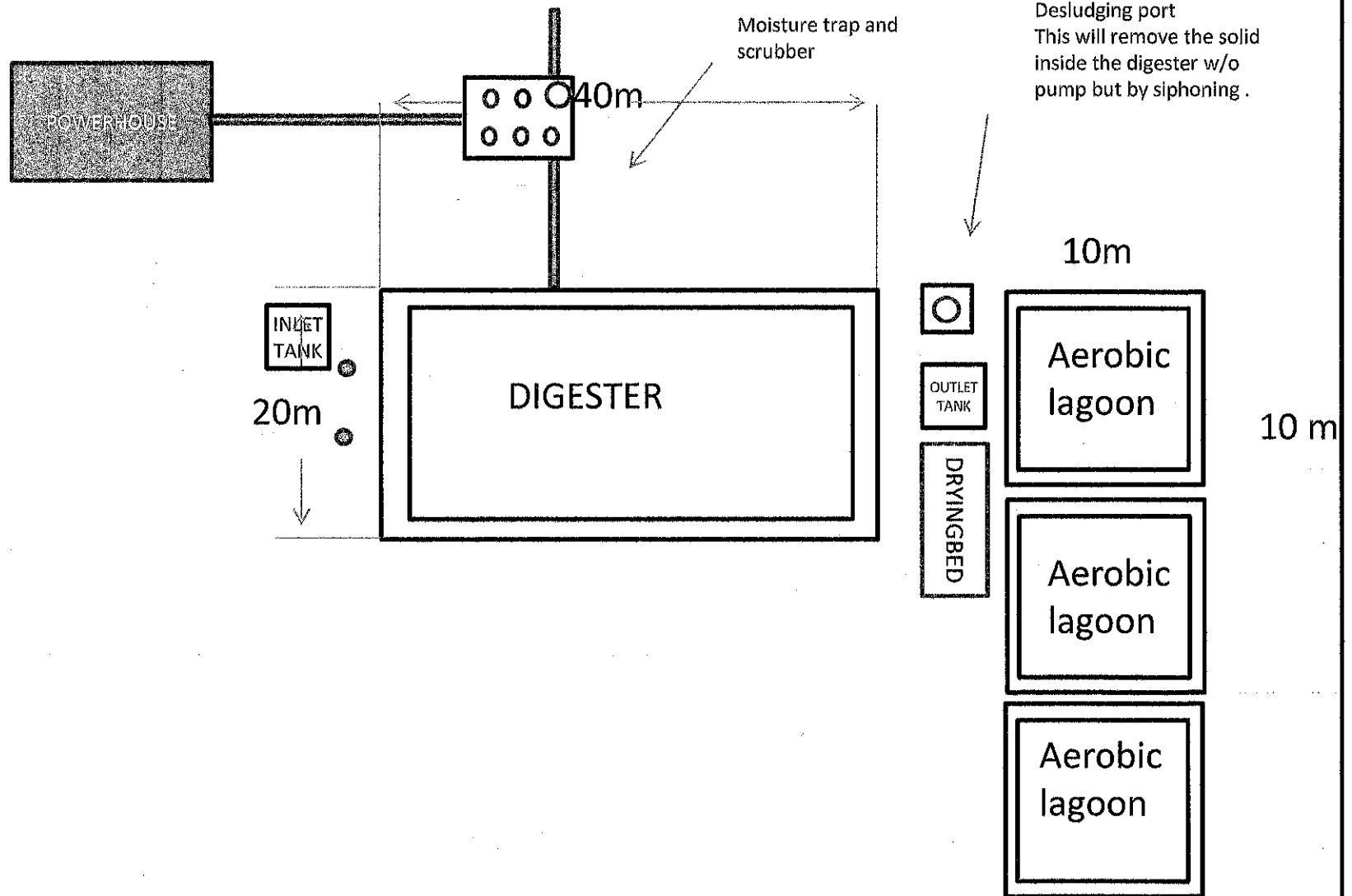
## APPENDICES





# SERED Environmental Consultancy

Brgy. San Isidro, Antipolo City, Philippines Tel no. (632) 4877695 email address: sgs2113@yahoo.com



SERED ENVIRONMENTAL CONSULTANCY

BIOGAS WASTEWATER TREATMENT FACILITY

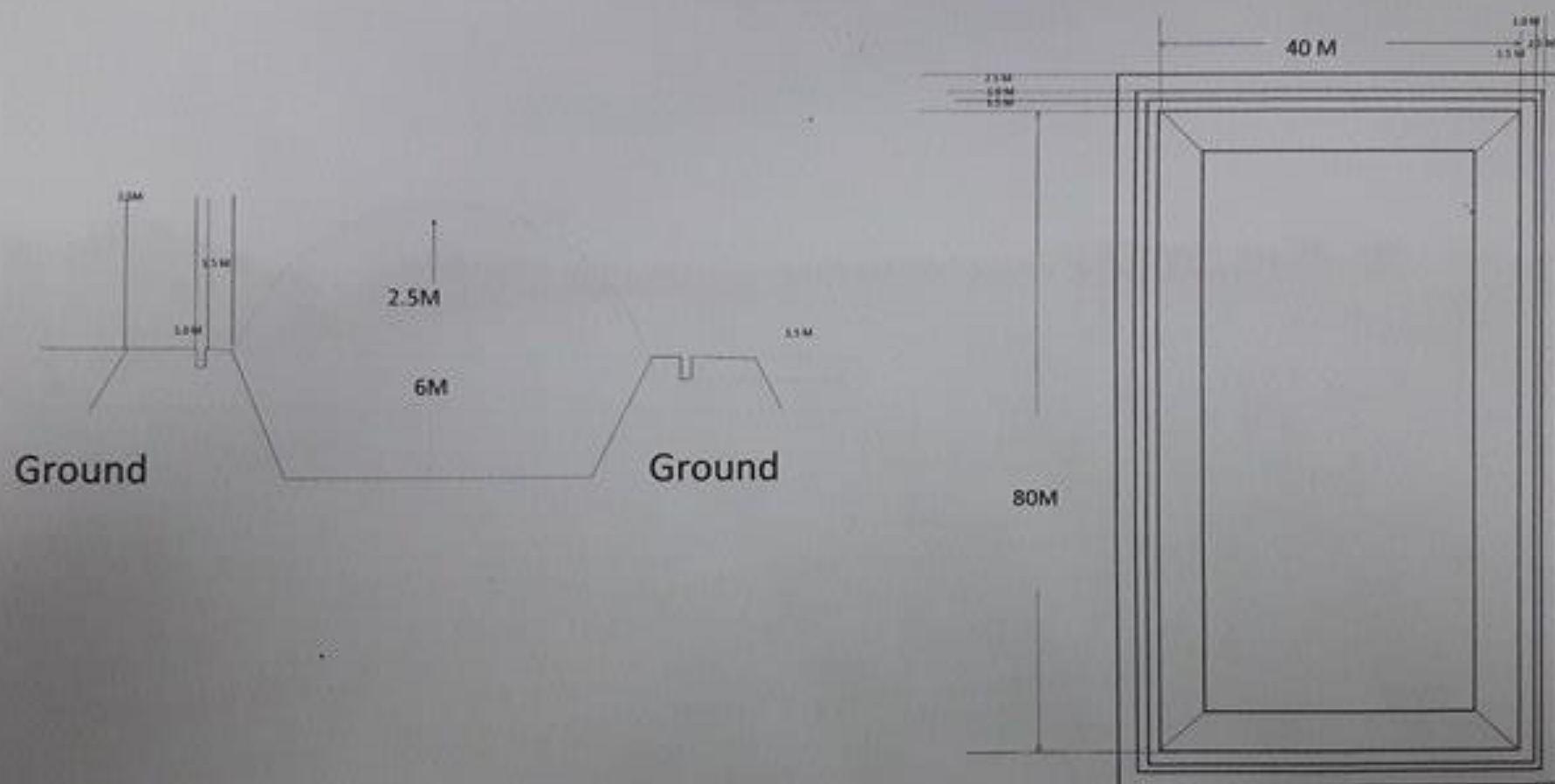
PREPARED BY: SHIELSON G. SIBOLBORO

LOCATION



# SERED Environmental Consultancy

Reg. San Isidro, Angeles City, Philippines Tel. no. (02) 4075495 email address: sered@sered.com

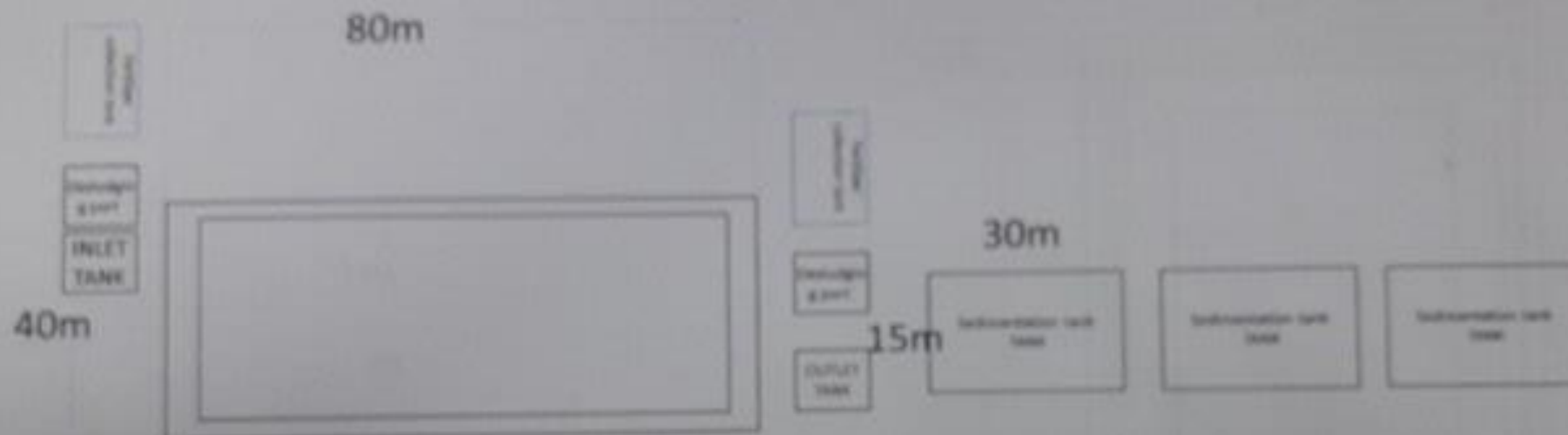


SERED ENVIRONMENTAL CONSULTANCY	BIOGAS WASTEWATER TREATMENT FACILITY	
PREPARED BY: SHIELSON G. SIBOLBORO	Malasique, Pangasinan	DIGESTER



SERED Environmental Consultancy

Reg. No. 1001, 100101-110, Philippine Water 2000-2010 and 2010-2020



SERED ENVIRONMENTAL CONSULTANCY	BODAS WASTEWATER TREATMENT FACILITY	
PREPARED BY: SHELDON G. SOLORDO	Malinao, Pangasinan	

**Appendix B. Health and Safety Risks Management Plan of JB de Guzman Farm and Poultry Supply – San Carlos**

Hazard	Possible Harm	Source / Cause	Prevention / Minimization	Person Responsible
<b>physical</b>				
noise	discomfort, hearing damage	pig squeals	<ul style="list-style-type: none"> <li>- pigs consistently feed to prevent stress</li> <li>- PPEs (ear protection)</li> <li>- Tunnel ventilated pig houses confine noise</li> </ul>	Farm Personnel
		running machineries and vehicles	<ul style="list-style-type: none"> <li>- install noise-control devices, when applicable</li> <li>- regular equipment inspection and maintenance</li> <li>- limit noise-generating activities during day time</li> <li>- PPEs (ear protection)</li> </ul>	Farm Personnel PCO
vibration	discomfort, ergonomic and nerve injuries, fatigue	running machineries	<ul style="list-style-type: none"> <li>- position vibration-producing equipment in enclosed areas</li> <li>- install shock absorber</li> <li>- ensure all loose equipment are securely placed</li> <li>- regular equipment inspection and maintenance</li> <li>- PPEs (gloves)</li> </ul>	Farm Personnel
electricity	shock, electrocution, burns	faulty machineries and power lines	<ul style="list-style-type: none"> <li>- get services of a licensed electrician</li> <li>- consult equipment manual</li> <li>- regular equipment inspection and maintenance</li> </ul>	Farm Manager Electrician
		improper use (or servicing) of electrical equipment	<ul style="list-style-type: none"> <li>- restrict access to equipment</li> <li>- signage and warnings</li> <li>- train staff (consult equipment manual)</li> <li>- ensure electricians are provided with proper PPEs for working with electrical equipment (insulated gloves, boots, etc.)</li> </ul>	
heat	burns	running machineries (hot surfaces, vapors, liquids)	<ul style="list-style-type: none"> <li>- use insulation where possible</li> <li>- ensure equipment is fitted with machine guards</li> <li>- signage and warnings</li> <li>- ensure workers wear proper PPE such as long sleeved shirts.</li> </ul>	Farm Personnel
	discomfort, heat exhaustion, heat stroke	adverse hot weather	adequate hydration and rest breaks	Farm Personnel
		working in enclosed spaces with limited ventilation		
dust	irritation, respiratory distress / diseases	Feeds	<ul style="list-style-type: none"> <li>- Tunnel ventilated pig houses prevent dust and feeds from dispersing to the outside</li> <li>- Use of automatic feeders to limit dispersion of feed particles</li> <li>- calm work pacing to avoid exciting the pigs</li> <li>- thorough cleaning of indoor spaces</li> <li>- PPEs (mask)</li> </ul>	Farm Personnel PCO
		dried sludge		
		Compost		
poor lighting	eye strain, can't see hazards	unlit / inadequately lit areas	<ul style="list-style-type: none"> <li>- install light sources</li> <li>- windows are constructed wide enough to allow for ambient light during the daytime</li> <li>- carry portable light sources</li> </ul>	Farm Personnel
<b>chemical</b>				
harmful gases, dust, vapors (inhalation)	discomfort (odor), asphyxiation, poisoning, respiratory distress / diseases	degrading organic wastes	<ul style="list-style-type: none"> <li>- measures for odor control (see Table 5)</li> <li>- <b>protocol for working in CONFINED SPACES</b></li> <li>- signage and warning (entrance to confined spaces)</li> <li>- train staff (handling hazardous substances and wastes and working in confined spaces; review MSDS / product information sheets)</li> <li>- PPEs (mask)</li> <li>- ensure first aid kits are readily available</li> </ul>	Farm Manager
		hazardous substances (cleaning and pest control chemicals, veterinary medicines, fuels, hazardous wastes, etc.)		
		fuel burning (machineries, vehicles)	<ul style="list-style-type: none"> <li>- air pollution control device</li> <li>- regular equipment inspection and maintenance</li> </ul>	Farm Manager PCO
		fugitive gases	regular inspection and maintenance of MRF	Farm Personnel
hazardous substances (contact, ingestion)	irritation, burns, poisoning, skin problems	hazardous substances (cleaning and pest control chemicals, veterinary medicines, fuels, hazardous wastes, etc.)	<ul style="list-style-type: none"> <li>- proper labelling, containers, and storage</li> <li>- restrict access to chemical and hazardous waste storage</li> <li>- train staff (handling hazardous substances and wastes; review MSDS / product information sheets)</li> <li>- only competent staff should administer veterinary medicines</li> <li>- regular inspection and equipment maintenance</li> <li>- ensure first aid kits are readily available</li> <li>- PPEs (gloves, eye glasses)</li> </ul>	Farm Manager PCO Farm Personnel
		wastewaters	<ul style="list-style-type: none"> <li>- regular inspection and maintenance of MRF</li> <li>- PPEs (gloves, goggles, boots)</li> </ul>	

biological				
pathogens / infectious agents, toxins and other products	various infectious diseases, parasites, irritation	pathological materials / tissues	<ul style="list-style-type: none"><li>- proper disposal of animal and veterinary wastes (see Table 5)</li><li>- quarantine measures</li><li>- improve ventilation</li><li>- good housekeeping practices (disinfection)</li><li>- practice hygienic practices (especially hand hygiene)</li><li>- workers' regular health examination</li><li>- train staff (animal handling, proper waste handling and disposal)</li><li>- PPEs</li></ul>	Farm Personnel (Vets, Animal Science practitioner) PCO
		sick animals		
		animal excretions and fluids		
		manure (wastewaters)		
		sludge		
		veterinary wastes (especially sharps)		
		potential disease carriers (objects, people, dust)		
		insects, pests, vermin	<ul style="list-style-type: none"><li>- proper disposal of odorous wastes (see Table 5)</li><li>- good housekeeping practices</li><li>- pest control</li></ul>	Farm Personnel
ergonomic				
ergonomic stress	ergonomic injuries	repetitive actions, forceful exertions, sustained awkward posture	<ul style="list-style-type: none"><li>- purchase / design equipment with ergonomic features</li><li>- use aid of appropriate equipment</li><li>- train staff (proper techniques and postures)</li><li>- buddy system</li><li>- job rotation / adequate rest (in between tasks)</li></ul>	Farm Manager Farm Personnel
		improper use of equipment	<ul style="list-style-type: none"><li>- train staff (consult manuals)</li></ul>	Farm Manager
		use of faulty equipment	<ul style="list-style-type: none"><li>- repair or replace equipment</li><li>- regular equipment maintenance</li></ul>	Farm Manager Farm Personnel
other accidents and contingencies				
slips, trips, falls	injuries, wounds, contusions	spills (slips)	<ul style="list-style-type: none"><li>- daily safety briefings and regular trainings</li><li>- barricading of work areas</li><li>- PPEs</li></ul>	Farm Personnel
		various objects, debris (trips)		
		heights, slips (falls)		
	drowning	open lagoons and biodigester	<ul style="list-style-type: none"><li>- Barricading of said areas</li><li>- signage and warnings</li><li>- ropes in/near lagoons (for rescuing)</li></ul>	Farm Manager Farm Personnel
entanglement	injuries, wounds, strangulation	machineries	<ul style="list-style-type: none"><li>- install equipment safeguards</li><li>- tie back long hair</li><li>- wear long sleeve shirts and PPEs</li><li>- regular equipment inspection and maintenance</li></ul>	Farm Manager Farm Personnel
blows, punctures	injuries, wounds, contusions	pig handling	<ul style="list-style-type: none"><li>- animal restraints</li><li>- ensure enough space to maneuver</li><li>- train staff (animal handling techniques)</li><li>- wear appropriate PPE (boots, gloves etc)</li></ul>	Farm Personnel Farm Manager
sharps	sharps injuries, wounds	veterinary activities, waste handling	<ul style="list-style-type: none"><li>- train staff (proper waste handling and disposal)</li><li>- PPEs (gloves, goggles)</li></ul>	Farm Manager
lack of oxygen / harmful gases	suffocation, poisoning	confined spaces (power house, manure pits, biodigester, enclosed pens and other chambers)	<ul style="list-style-type: none"><li>- signage and warnings</li><li>- 'buddy system'</li><li>- train staff (on protocol and rescue plan)</li><li>- consider the purchase of gas monitoring equipment</li></ul>	Farm Manager Farm Personnel
fires	Burns	faulty electrical systems, explosions, fugitive gases, accidental ignition	<ul style="list-style-type: none"><li>- comply with requirements and regulations of fire authorities</li><li>- provide adequate and proper (multipurpose) fire protection equipment</li><li>- designate smoking areas away from digester, gas tanks, and electrical equipment and storage of combustible materials (compost, sludge, chemicals)</li><li>- restrict access to MRF (fencing)</li><li>- prohibit smoking and use of cellphones around MRF and gas storage facilities</li><li>- regular clearing of vegetation near farm structures</li><li>- signage and warnings</li><li>- train staff (on contingency plan and proper equipment use)</li><li>- regular inspection and maintenance of electrical systems and equipment</li></ul>	Farm Manager Farm Personnel
blast	blast injuries	excessive pressure in biodigester, fugitive gases, contained gases in confined spaces, fires	<ul style="list-style-type: none"><li>- keep sources of heat, including machineries, at a safe distance from MRF</li><li>- restrict access to MRF (fencing)</li><li>- prohibit smoking and use of cellphones around MRF and gas storage facilities</li><li>- regular inspection and maintenance of MRF</li><li>- signage and warnings</li><li>- consider the purchase of gas monitoring equipment</li></ul>	Farm Manager Farm Personnel

# J.B. DE GUZMAN FARM

Brgy. Naguilayan, San Carlos City, Pangasinan

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July 20, 2015

**DR. EDWIN DE VERA GUINTO**

Municipal Health Officer  
San Carlos City, Pangasinan

Dear Sir:

Warm Greetings!

The J.B. De Guzman Farm, in cooperation with the Land Bank of the Philippines, will conduct a Stakeholders' Consultation for our proposed Biogas Project to be held on August 05, 2015, 8:30 AM, at the location of our farm in Brgy. Naguilayan, San Carlos City Pangasinan.

Key points on Clean Development Mechanism (CDM) and in-depth information on the project, such as Environmental Management Plan and Sustainable Development benefits, will be presented. An open forum will be held after the presentation to allow participants to raise inquiries and clarification on the proposed Biogas Project.

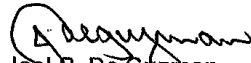
In this regard, we would like to invite you or a representative from your office to participate in this activity. Attached is the agenda of the program.

Should you need more information or confirmation of your attendance, please feel free to inquire at contact numbers 09323571477 and 09173277193.

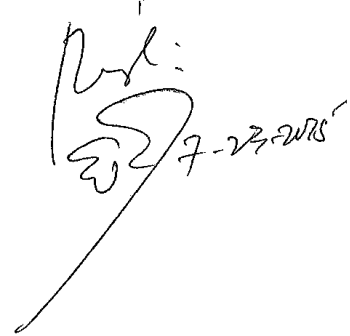
We hope to receive your favorable reply to this invitation.

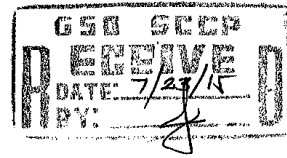
Thank you.

Sincerely yours,



Joel B. De Guzman  
Farm Owner





## J.B. DE GUZMAN FARM

Brgy. Naguilayan, San Carlos City, Pangasinan

---

July 20, 2015

**MRS. LOURDES R. PINTO**  
Municipal Environmental Officer  
San Carlos City, Pangasinan

Dear Madam:

Warm Greetings!

The J.B. De Guzman Farm, in cooperation with the Land Bank of the Philippines, will conduct a Stakeholders' Consultation for our proposed Biogas Project to be held on August 05, 2015, 8:30 AM, at the location of our farm in Brgy. Naguilayan, San Carlos City Pangasinan.

Key points on Clean Development Mechanism (CDM) and in-depth information on the project, such as Environmental Management Plan and Sustainable Development benefits, will be presented. An open forum will be held after the presentation to allow participants to raise inquiries and clarification on the proposed Biogas Project.

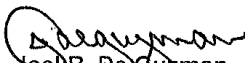
In this regard, we would like to invite you or a representative from your office to participate in this activity. Attached is the agenda of the program.

Should you need more information or confirmation of your attendance, please feel free to inquire at contact numbers 09323571477 and 09173277193.

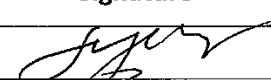

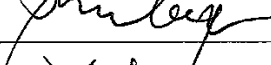
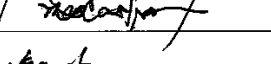
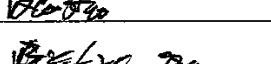
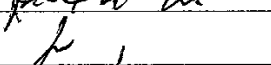

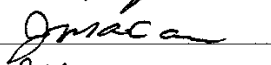
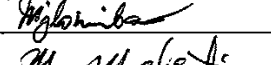
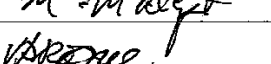
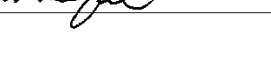
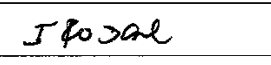
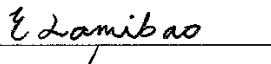
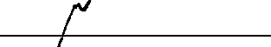

We hope to receive your favorable reply to this invitation.

Thank you.

Sincerely yours,

  
Jose B. De Guzman  
Farm Owner

**J.B. DE GUZMAN FARM**  
**CLEAN DEVELOPMENT MECHANISM (CDM)**  
**Methane Recovery and Combustion from Animal Waste Management System**  
**Stakeholders' Consultation**  
 Barangay Naguilayan, San Carlos City, Pangasinan  
 August 05, 2015

Name	Organization / Affiliation	Address	Contact Numbers	Signature
Shielson Sibolboro	SERED Biogs	Antipolo	09178803611	
Sanny Sibolboro	SERED	Proj. 5 B.C.	09182041192	
SAMUEL P. ECPMB	LGU SAN CARLOS CITY	PACARK, SCOP	09437003444	
Ma. Cecilia B. Castro	B.S.P.D. - / BNS	Naguilayan	09092453681	
Virginia S. Castro	B.H.W.	Naguilayan		
Ludovico P. Castro	Brgy. Kagawad		09474341599	
Georgy G. De Guzman	Brgy. Kagawad		09422908255	
Capt. Lorenzo Cruz		Naguilayan	09212624788	
Julita Ormac	B.H.W.		09082668538	
Martina S. Sibolboro	BHW	"	09697662879	
Marilyn M. Dela	B.H.W.			
Violeta A. Roque	B.H.W.	Naguilayan		
Buddy M. Cruz				
Imelda Fosal				
Edin de Zamibao				
Eduardo A. Puy	Brgy. Kagawad	"		



**J.B. DE GUZMAN FARM**  
**CLEAN DEVELOPMENT MECHANISM (CDM)**  
**Methane Recovery and Combustion from Animal Waste Management System**  
**Stakeholders' Consultation**  
 Barangay Naguilayan, San Carlos City, Pangasinan  
 August 05, 2015

Name	Organization / Affiliation	Address	Contact Numbers	Signature
Isaia U. Natividad		Tandoc, SCSF	09275943944	Isaia U. Natividad
Angelo Castro		Naguilayan		Angelo Castro
Dolores de Guzman		Naguilayan		Dolores de Guzman
VIOLAN L. SORIANO		Brgy. Naguilayan		Violan L. Soriano
Manuel		Brgy. Naguilayan		Manuel
Araceli de Guzman		Naguilayan		Araceli de Guzman
JOSIE C. DIAZ, JR.	LAND BANK - CMO	Malate, MIA		Josie C. Diaz, Jr.
Amelito Segarra, Jr.	-do-	-do-		Amelito Segarra, Jr.
LYLA R. MAGUED	LBP	Dagupan City		Lyra R. Magued
BERNARD G. SICO	LBP - PC	Dagupan City	09474943178	Bernard G. Sico
Estelita A. Reyes		Naguilayan		Estelita A. Reyes
Flore C. Rosal		Naguilayan		Flore C. Rosal
Quinta L. Hiron		Naguilayan	0931220884	Quinta L. Hiron
Marciana R. Dela Cruz		Naguilayan	09482612227	Marciana R. Dela Cruz
Loreta de Guzman		11		Loreta de Guzman
Rosalie Lombao		Naguilayan	09485910712	Rosalie Lombao

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## MINUTES OF STAKEHOLDERS' CONSULTATION

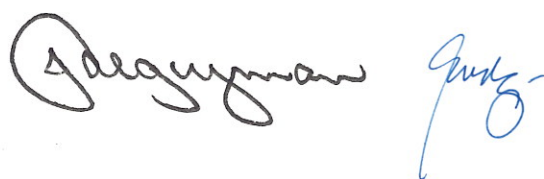
<b>What:</b>	Stakeholders' Consultation on Clean Development Mechanism (CDM) for the Proposed Methane Recovery and Combustion System (Biogas Project) of J.B. De Guzman Farm
<b>When:</b>	August 05, 2015, 8:30AM – 12:00PM
<b>Where:</b>	J.B. De Guzman Farm at Barangay Naguilayan, San Carlos City, Pangasinan
<b>Organized by:</b>	Spouses Mr. Joel De Guzman and Mrs. Sandra De Guzman, proprietors of J.B. De Guzman Farm

### REGISTRATION OF PARTICIPANTS

1. Registration of participants was opened at 8:30AM. Actual conduct of Stakeholders' Consultation activity was started 10:00AM to allow for the arrival and attendance of as many participants as possible.
2. Twenty-six (26) community members from Barangay Naguilayan attended the activity, including the following important personages:
  - a.) Barangay Captain Lorenzo Cruz;
  - b.) Barangay Councillors: Mr. Ludovico B. Castro, Mr. Gerry De Guzman, and Ms. Eleanor A. Perez;
  - c.) Barangay Health Workers: Ms. Virginia S. Castro, Ms. Julita D. Macan, Ms. Marlina J. Somibac, Ms. Marilyn Malgit, and Ms. Violeta A. Roque;
3. Mr. Samuel P. Espino represented the local government of San Carlos City;
4. Messrs. Shielson and Sonny Sibolboro represented SERED Biogas, the company contracted to install the biogas system at the J.B. De Guzman Farm. Mr. Sheilson Sibolboro designed the biogas system installed.
5. Attendees from Land Bank of the Philippines included the following:
  - a.) Mr. Jaime S. Cruz – DM, LBP Pangasinan LC;
  - b.) Mr. Bernardino C. Morales – DM, LBP San Carlos City Branch;
  - c.) Ms. Lyla R. Magleo and Mr. Bernard G. Seco – Account Officers, LBP Pangasinan LC;
  - d.) Mr. Jose C. Diaz, Jr. and Mr. Amelito L. Segarra Jr. – Program Officers, EPMD;
  - e.) Mr. Greg Locquiao and Mr. Elvis Pancho – LBP support personnel;
6. Total attendance to the activity is thirty-nine (39) pax, including organizers Spouses Joel and Sandra De Guzman.

### OPENING PROGRAM

7. Opening Prayer was led by Ms. Lyla Magleo, as well as the introduction of participants and speakers.
8. Mr. Joel De Guzman and Mr. Jaime Cruz welcomed all the participants and thanked them for taking the time and effort to attend the Stakeholders' Consultation. In his message, Mr. Cruz stressed the commitment of LBP for environmental protection in its projects, and ensuring environmental awareness of its stakeholders, emphasizing these as the main reasons for conducting the Stakeholders' Consultation activity.
9. The Barangay Captain of Naguilayan also delivered a short message for all of his constituents who attended the Stakeholders Consultation. He thanked the farm owners, the biogas contractor and LBP for facilitating this activity that will give clear information about the biogas project and answer the issues and concerns of his constituents.





## **ABOUT THE CLEAN DEVELOPMENT MECHANISM (CDM) AND CARBON FINANCE SUPPORT FACILITY (CFSF)**

10. Mr. Jose Diaz, Jr. discussed topics on Climate Change and CDM; and Mr. Amelito Segarra Jr. presented Landbanks' CFSF.
11. The following were the highlights of the topics presented:
  - a.) The general overview of the CDM process to be implemented by LBP with the World Bank (WB), as regards validation to Carbon Credits, issuance of CERs (emission reduction certificates), and the corresponding trading of the certificates for these CERs at the negotiated carbon market price with WB;
  - b.) The United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol, as that which gave rise to the CDM--- were mentioned to participants to explain why outside institutions (i.e. WB) and several developed countries are interested in 'purchasing' Carbon Credits or CERs from developing nations;
  - c.) Basic concepts on Climate Change and Greenhouse Gas emissions, in relation to Global Warming and its perceived effects, were also discussed;
  - d.) Carbon Credits and issuance of CERs were emphasized to require accurate and regular reporting of methane gas production data from operating biogas digesters, and validation and documentation of the reported data by designated authorities;
  - e.) LBP as a government institution not only with a mandate for countryside development, but with a clear vision for ensuring and implementing environmental compliance and environmental protection initiatives;
  - f.) LBP to provide institutional assistance as regards CDM validation processes and required documentation, and technical assistance.

## **PROJECT DISCUSSION**

12. Mr. Shielson Sibolboro presented the design and specifications of the biogas digester constructed for the J.B. de Guzman Farm in Barangay Naguilayan, San Carlos City, Pangasinan, as well as the benefits of having a biogas system. The following are the highlights of his presentation:
  - a.) The biogas digester was constructed by digging an area 20 meters by 40 meters to a depth 6 meters below ground, then overlaying the walls and floor of this space with a **lona** (or canvas) made of HDPE (high density polyethylene) material. The biodigester chamber was then covered with additional HDPE canvas material to ensure anaerobic conditions are maintained within the chamber. Biomass (pig manure material and wastewater) coming from the pig houses are directed to the biogas digester, which is then converted to methane by microorganisms. Through a release valve connected to the biodigester chamber, the methane produced may be used for energy conversion or may be flared. As designed, the biogas digester can hold biomass material up to 30 days prior to being loaded into an open-air settling pond connected to the main biodigester chamber.
  - b.) He enumerated the benefits of having a biogas system installed at the farm, including: farm operational cost reduction potential (from conversion of methane gas to energy source for piggery operations), cleaner production (mitigation of an estimated of up to 80% of foul odor from animal waste after processing in biogas digester equipment), and better waste management (of animal waste and wastewater produced from piggery operations).
  - c.) Likewise, he mentioned that during the construction phase of the biogas digester, about 100 workers, mostly members of the barangay community were employed and benefited by the project. Presently, two (2) individuals from barangay Naguilayan were

*De Guzman Jr.*

retained and formally trained for the daily operation and maintenance of the biogas digester.

#### OPEN FORUM/ISSUES AND CONCERNS

13. The participants were then given the chance to raise questions, issues, or concerns regarding the Biogas System project at J.B. De Guzman Farm in Barangay Naguilayan.

Questions, Issues, or Concerns Raised	Responses Provided
<p>Ms. Ma. Cecilia B. Castro, a resident of Barangay Naguilayan, aired her concern about the durability of the canvas material used as lining and covering for the biogas digester.</p> <p><i>(‘Gaano tatagal ang trapal na ginamit sa biogas digester?’)</i></p>	<p>Mr. Sibolboro provided response to this. According to him, the canvas material he used was manufactured in Canada, with a product lifetime projected to be 25 years (compared to same material made from lesser brands, which can last only up to 10 years).</p> <p>Mr. Sibolboro further noted that the material used to line the inner walls and floor of the biodigester may remain indefinitely, and need only be replaced in the event of damage caused by extreme ground movements. Only the material used for covering the biodigester will have to be replaced after considerable wear and tear.</p>
<p>Ms. Rosalie Lomibao, resident of Barangay Naguilayan, asked what are the practical benefits of the project to the community?</p> <p><i>(‘Anung pakinabang ng biogas project sa amin sa community?’)</i></p>	<p>a.) Mr. Sibolboro reiterated the practical benefits to the community he mentioned earlier, emphasizing on lesser levels or intensity of animal mal-odor expected to emanate from the farm, and cleaner operations of the farm.</p> <p>b.) Mr. Jaime Cruz, of Pangasinan LC, explained that the partnership between J.B. De Guzman Farm and LBP ensures that environmental protection and environmental compliance will be a great consideration in the project, which will be for community’s interests and benefit.</p> <p>c.) Mr. Joel De Guzman, proprietor of J.B. De Guzman Farm, pledged the following:</p> <ul style="list-style-type: none"><li>▪ He will coordinate with the barangay captain for the installation of streetlights in the barangay, to be powered by electricity to be generated from the farm’s biogas digester; and</li><li>▪ He will use monetary proceeds from the CER’s to support programs or projects for the barangay community, also in close coordination with barangay captain.</li></ul>

*De Guzman*



14. After the Open Forum, Mr. Jose Diaz Jr., of LBP-EPMD, enjoined the community members to help in dispelling any misinformation that may be encountered outside of the Stakeholders' Consultation activity, and help spread correct information more about the positive aspects and benefits expected from the biogas system project at J.B. De Guzman Farm.
15. The barangay officials and community health workers expressed their support for the biogas project of J.B. De Guzman Farm.

#### **CLOSING REMARKS**

16. Mrs. Sandra De Guzman was called on to deliver some short closing remarks. She duly thanked participants of this activity, especially the community members of Barangay Naguilayan, for taking the time and effort to attend and actively join in the discussions. The Stakeholders' Consultation activity was then formally ended at 12:00 noon of the same day.

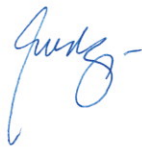


**JOEL B. DE GUZMAN**

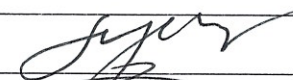

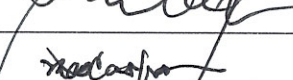
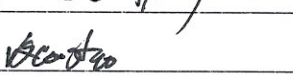
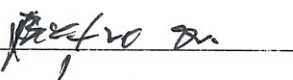

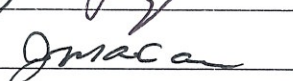
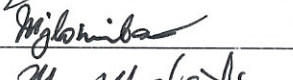
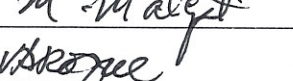
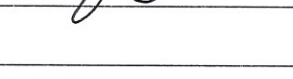
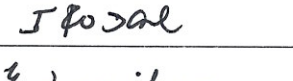

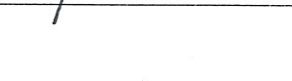


Proprietor

J.B. De Guzman Farm

Barangay Naguilayan, San Carlos City, Pangasinan



**J.B. DE GUZMAN FARM**  
**CLEAN DEVELOPMENT MECHANISM (CDM)**  
**Methane Recovery and Combustion from Animal Waste Management System**  
**Stakeholders' Consultation**  
 Barangay Naguilayan, San Carlos City, Pangasinan  
 August 05, 2015

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Virginia S. Castro	B.H.W.	Naguilayan		
Ludovico F. Castro	Brgy. Kagawad	11	09474341599	
GERRY G. DE GUZMAN	Brgy. Kagawad	11	09422908255	
Capt. Lorenzo Cruz		Naguilayan	09212624788	
Julita D. Macan	B.H.W.	11	09082668538	
Marilyn J. Sanibao	BHW	"	09097662879	
Marilyn M. Malt	B.H.W.	11		
VIOLETA A. RODRIGUE	B.H.W.	Naguilayan		
Buddy de Guzman		11		
Imelda FOSIL		11		
Erinda Zamitao		11		
Eleanor A. Inf	Brgy. Kagawad	"		

**J.B. DE GUZMAN FARM**  
**CLEAN DEVELOPMENT MECHANISM (CDM)**  
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 August 05, 2015

Name	Organization / Affiliation	Address	Contact Numbers	Signature
Genia U. Nolasco		Tandoc, SCDP	09275943944	Genia U. Nolasco
Angelo Castro		Naguilayan		Angelo Castro
Dolores de Guzman		Naguilayan		Dolores de Guzman
VIVIAN L. SORIANO		Brgy. Naguilayan		Vivian L. Soriano
Manuel		Brgy. Naguilayan		Manuel
Proencio de Guzman		Naguilayan		Proencio de Guzman
JOSF C. DIAZ JR	LAND BANK - CDM	Malate, M/a		Josf C. Diaz Jr
Amelito Segarra, Jr.	-do-	-do-		Amelito Segarra, Jr.
LYLA R. MAGLEO	LBP	Dagupan City		Lyra R. Magleo
BERNARD G. SEO	LBP - PLC	Dagupan City		Bernard G. Seo
Julio A. Reyes		Naguilayan	09474943178	Julio A. Reyes
Flora C. Rosal		Naguilayan		Flora C. Rosal
Gracia L. Hiron		Naguilayan	0951223854	Gracia L. Hiron
Marciana R. Delacruz		Naguilayan	09482612277	Marciana R. Delacruz
Loreta de Guzman		"		Loreta de Guzman
Rosalie Comibao		Naguilayan	09485910712	Rosalie Comibao



August 05, 2015

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# J.B. DE GUZMAN FARM

Brgy. Naguilayan, San Carlos City, Pangasinan

---

July 20, 2015

**MRS. LOURDES R. PINTO**  
Municipal Environmental Officer  
San Carlos City, Pangasinan

Dear Madam:

Warm Greetings!

The J.B. De Guzman Farm, in cooperation with the Land Bank of the Philippines, will conduct a Stakeholders' Consultation for our proposed Biogas Project to be held on August 05, 2015, 8:30 AM, at the location of our farm in Brgy. Naguilayan, San Carlos City Pangasinan.

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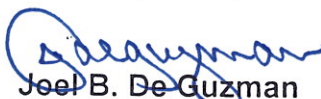
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Should you need more information or confirmation of your attendance, please feel free to inquire at contact numbers 09323571477 and 09173277193.

We hope to receive your favorable reply to this invitation.

Thank you.

Sincerely yours,

  
Joel B. De Guzman  
Farm Owner

# J.B. DE GUZMAN FARM

Brgy. Naguilayan, San Carlos City, Pangasinan

---

July 20, 2015

**DR. EDWIN DE VERA GUINTO**

Municipal Health Officer  
San Carlos City, Pangasinan

Dear Sir:

Warm Greetings!

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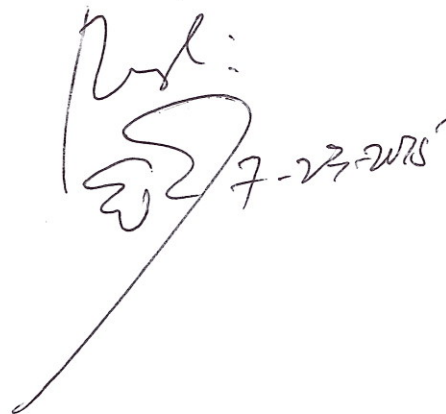
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Thank you.

Sincerely yours,



Joel B. De Guzman  
Farm Owner





# J.B. DE GUZMAN FARM

Brgy. Naguilayan, San Carlos City, Pangasinan

---

July 20, 2015

**MRS. ESTRELIETA B. CABANSAG**

Municipal Agricultural Officer  
San Carlos City, Pangasinan

Dear Madam:

Warm Greetings!

The J.B. De Guzman Farm, in cooperation with the Land Bank of the Philippines, will conduct a Stakeholders' Consultation for our proposed Biogas Project to be held on August 05, 2015, 8:30 AM, at the location of our farm in Brgy. Naguilayan, San Carlos City Pangasinan.

Key points on Clean Development Mechanism (CDM) and in-depth information on the project, such as Environmental Management Plan and Sustainable Development benefits, will be presented. An open forum will be held after the presentation to allow participants to raise inquiries and clarification on the proposed Biogas Project.

In this regard, we would like to invite you or a representative from your office to participate in this activity. Attached is the agenda of the program.

Should you need more information or confirmation of your attendance, please feel free to inquire at contact numbers 09323571477 and 09173277193.


We hope to receive your favorable reply to this invitation.

Thank you.

Sincerely yours,



Joel B. De Guzman  
Farm Owner

  
7/23/15

## Stakeholders' Consultation on Clean Development Mechanism (CDM)

### "Proposed Methane Recovery and Combustion System (Biogas Project) of J.B. De Guzman Farm"

August 06, 2015, 8:30AM

J.B. De Guzman Farm, Brgy. Naguilayan, San Carlos City, Pangasinan

### **PROGRAM**

Activity / Agenda	Time	Remarks
Registration of Participants	8:30 – 9:00 AM	
<b><u>Opening Program</u></b> Opening Prayer/ Introduction of Participants/ Welcome Messages	9:00 – 9:30 AM	<i>To be facilitated by J.B. De Guzman Farm</i>
<b><u>About CDM and CFSF</u></b> Climate Change/ Clean Development Mechanism/ Carbon Finance Support Facility	9:30 – 10:00 AM	<i>To be presented by Land Bank of the Philippines</i>
<b><u>Project Discussion</u></b> Biogas Project/ Environmental Management Plan and Benefits	10:00 – 10:30 AM	<i>To be presented by J.B. De Guzman Farm</i>
Open Forum	10:30 – 11:00 AM	<i>To be facilitated by J.B. De Guzman Farm</i>
Closing Remarks	11:00 – 11:15 AM	

**Stakeholders' Consultation on  
Clean Development Mechanism (CDM)  
"Proposed Methane Recovery and Combustion System  
(Biogas Project) of J.B. De Guzman Farm"**

August 05, 2015, 8:30AM  
J.B. De Guzman Farm, Brgy. Naguilayan, San Carlos City, Pangasinan

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## Appendix D. Site Evacuation Plan



JB de Guzman Farm and Poultry Supply – San Carlos Point Persons:

Farm Manager: Joel B. de Guzman 0917 327 7193

Pollution Control Officer: Joel B. de Guzman and Sandra Jean de Guzman 0917 327 7193

Biodigester and GenSet Supplier:

Sustainable Environment thru Renewable Energy Development Consultancy 02 487 7695

Local Emergency Contact Details:

San Carlos City Police Station: 075 532 9896

San Carlos City Fire Station: 075 632 4586

Pangasinan Provincial Hospital: 075 532 2603