

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

CPA 21

Methane Recovery and Power Generation Project

Ref. No. 5979-007

CPA-21 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 ABBREVIATIONS

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

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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 Projects in pig farms.

Scope

Since the Methane Recovery and Power Generation Project is a key component of CPA 21's 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 CPA 21, 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: CPA 21
Business Address: Cebu City, Philippines
President & CEO:

Farm Name: CPA 21
Project Site: Pinamungahan, Cebu
Farm Coordinates:

Project Type: Livestock Project
Philippine Standard
Industrial Classification: 0145 - Hog Farming

Contact Persons CPA 21

Farm Manager:
Telephone No.:
Pollution Control Officer:
Telephone No.:

LANDBANK

Lending Programs

Management Group:

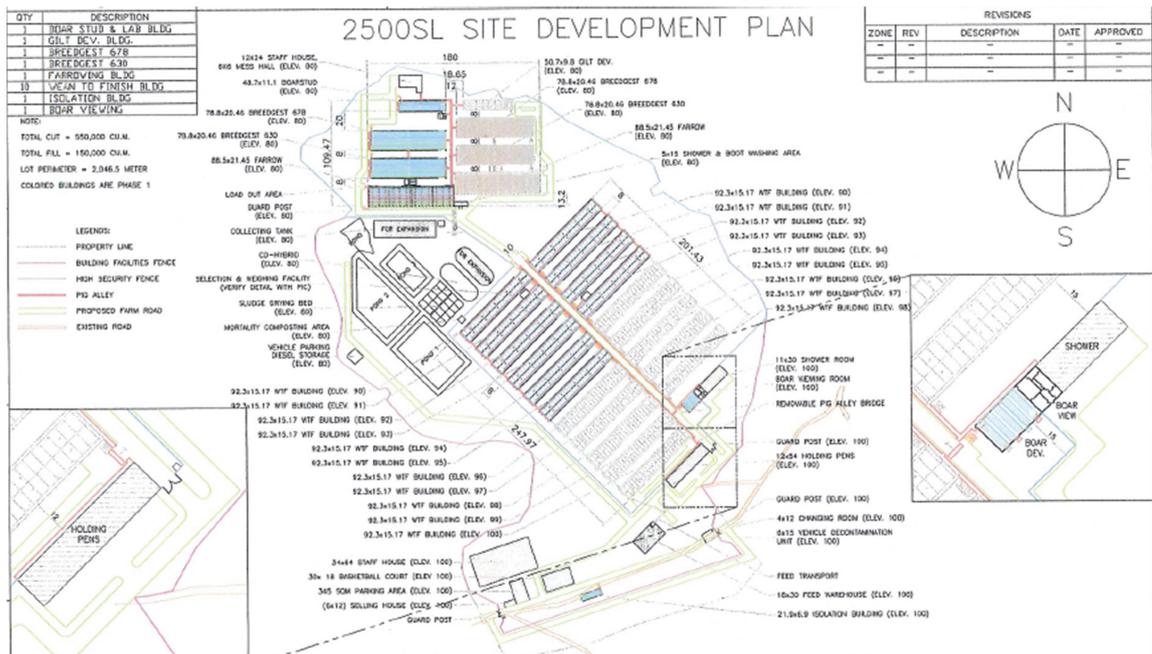
Designation: Emellie V. Tamayo
Head / First Vice President
Telephone No.: (632) 405-7309
Fax No.: (632) 528-8542

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 Pig Farm Profile



Farm area:	182,247 m ²
Production:	Farrow-to-Finish
Housing type:	Tunnel Ventilated
Capacity:	20,000 heads
Average population:	-
No. of Employees:	77
Operating hours:	24

Facilities observed at the farm are as follows: pig houses (29), staff house compound, administrative office (1, under construction), canteen (1), rest rooms, lagoons (4), biodigesters (2, 1-under construction), materials recovery facility (2), and groundwater extraction wells (2).

Water for the Farm's operations is sourced from two groundwater extraction wells found within the farm. The farm management has started its application to the National Water Resources Board (NWRB) for groundwater extraction well use. The farm is also connected to the local water district.

As of the site visit on December 2019, pig wastes are being directed to the site's 1st biodigester system. The farm currently does not utilize the methane produced for electricity production. Instead, the methane is flared. The farm intends to produce electricity once their 2nd biodigester is operational.

The Farm is connected to the grid of a local electricity concessionaire, Cebu III Electric Cooperative Inc (CIBECO III).

1.3 Project Description

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

1.3.1 Components and Design

CPA 21's wastewater treatment process is as follows:

- *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.

Components of the farm's wastewater treatment facility will be updated once their biodigester systems are operational.

The biodigester, by design, is able to accommodate 4,320 m³ of pig wastes and capture enough methane to power the project facilities for an amount 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 succeeding version of this ESMP (see Section 4).

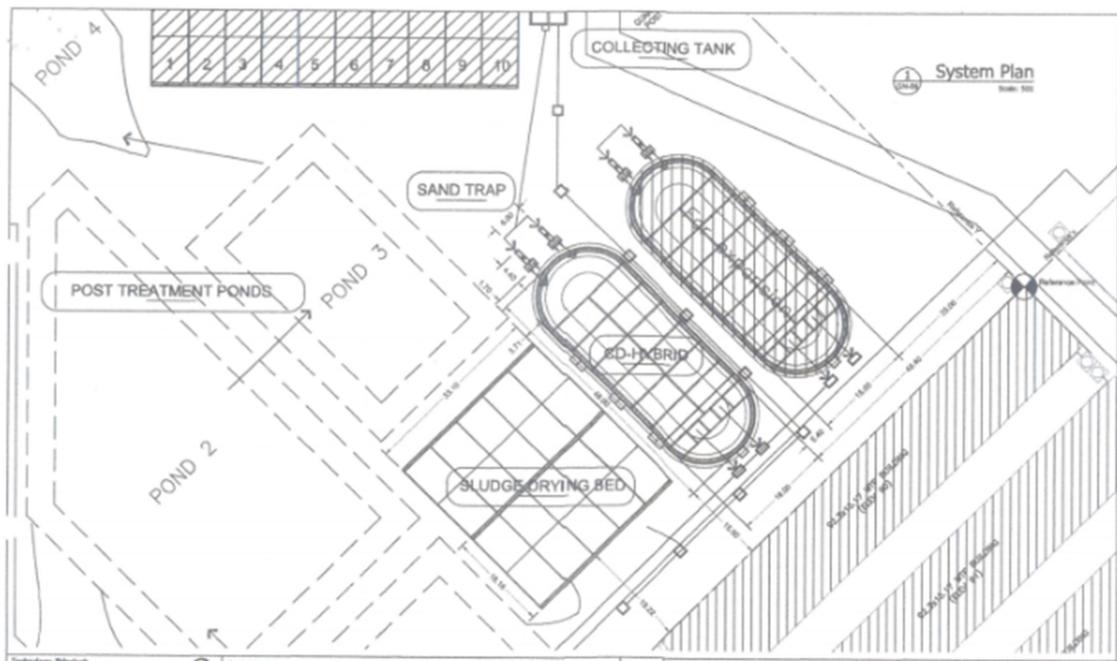


Figure 2. Floor plan of the biodigester of CPA 21



Biodigester 2



Clarifying Lagoon

Table 1 presents the particular processes and components involved in the treatment of wastewaters in the Farm.

Table 1. Specifications of CPA 21's Wastewater Treatment Facility-Methane Recovery Facility

Phase	Process	Component	No. of Units	Description / Equipment	
Pre-treatment	Settling	Sand Traps	2	5.25 m x 2 m x 6 m	
		Collection tank	1	2.5 m x 3.5 m x 1.5 m	
Anaerobic treatment	anaerobic digestion / fermentation	Biogas reactor fermentation chamber	1	48 m x 12 m x 1.5 m	
		Biogas reactor fermentation chamber	1	-not specified, under construction as of site visit-	
Post-treatment	Biogas	combustion	scrubber system	1	-not specified-
			generator set	1	280 kVa
	Effluent	clarification (settling, aeration)	Post treatment pond	4	-not specified-
	Sludge	Drying	Sludge drying bed	1	Concrete construction, multi-chambered

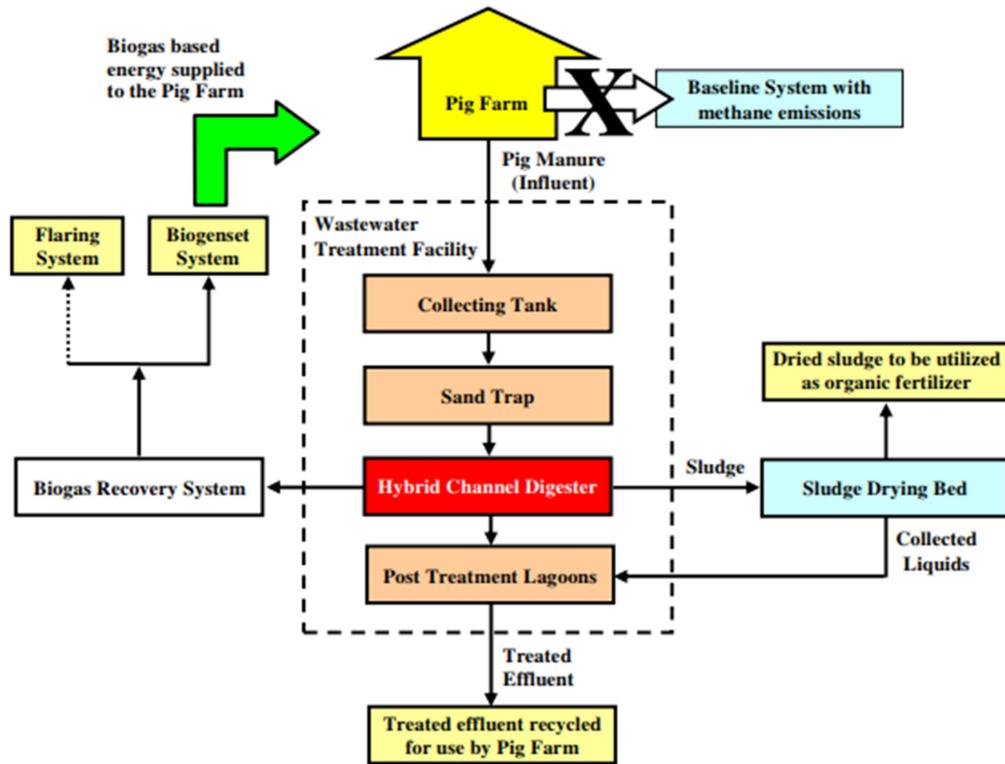
1.3.2 Operation

Wastewater from the pig sheds are channeled to a covered drainage system constructed beneath and around the pig sheds. Wastewaters flow through the drainage system towards the concrete underground biodigester. A system of screens ensures that solids are unable to enter the biodigester system.

The biodigester processes the wastewater through anaerobic digestion to produce methane. The methane is channeled via blowers to the methane containment tank. The pressure build-up within the containment tank allows the methane to flow through a series of scrubbers and to the biogas generator set for conversion to electricity.

The effluent from produced by the biodigester is then directed to a lagoon for drying.

The figure below illustrates the processes involved in wastewater treatment and methane recovery:



1.4 Existing Environmental Conditions in the Farm

CPA 21 is a 182,247 m² facility located in Pinamuhangan, Cebu, Philippines.

1.4.1 Land Classification and Use

The land on which the farm is situated is classified as an agro-industrial zone. The farm is surrounded by coconut plantations and low-density residential areas.

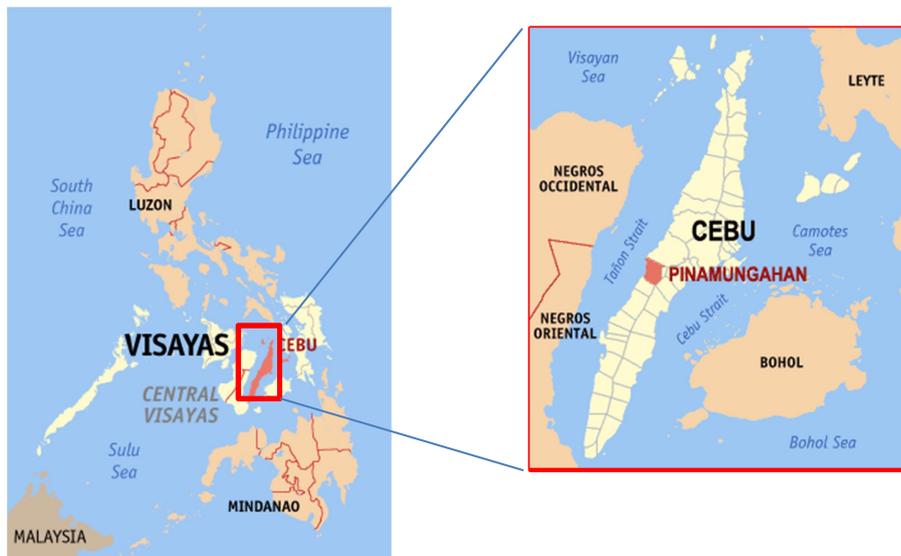


Figure 3. Map of the Philippines showing the location of Pinamungahan, Cebu

1.4.2 Climate

Köppen-Geiger system classifies the climate in Pinamungahan as tropical, with rainfall even in the dry season. Pinamungahan has an average annual temperature of 27.5 °C and an average annual precipitation of 1665 mm.

1.4.3 Topography and Soil

The Farm sits on hilly land that decreases in slope towards the northeast and is primarily composed of croplands. (<http://www.namria.gov.ph/3721-III-Carcar.html>).

1.4.4 Water Resources

The Tañon Strait is located approximately 3 km northeast of the farm. The strait was proclaimed as a protected seascape by virtue of Proclamation No. 1234, Series of 1998.

1.4.5 Natural Hazards

As per the Landslide and Flood Susceptibility Map of Pinamuhangan Quadrangle, Cebu Province, Philippines, the area on which the farm is located has a moderate susceptibility to landslides. <http://r7.mgb.gov.ph/wp-content/uploads/Files/GeohazardMaps/Cebu/pinamungahan.png>

1.4.6 People and Communities

Low-density residential areas are located in the immediate vicinity of the farm.

2 ENVIRONMENTAL DUE DILIGENCE

2.1 Impact Assessment

2.1.1 Positive Impacts

The Project improves CPA 21's method of handling and disposing pig manure and liquid waste. At present, the biodigester functions as the Farm's main wastewater treatment facility, significantly improving the quality of and minimizing foul smell from its effluent. And, more importantly, by providing a mechanism to capture methane and use it as a source of energy, the Project has been helping the Farm abate its overall greenhouse gas emission. With a capacity to accommodate the wastes from 20,000 heads, the Project is estimated to reduce greenhouse gas emissions equivalent to 21,749 tCO₂e every year.

Also, having been included in the CDM program, the farm has the opportunity to earn monetary incentives by selling their carbon credits.

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

CPA 21 is compliant to all the regulatory safeguards as shown in the succeeding tables, as enforced by the Philippine government, demonstrating due diligence of the Proponent.

2.2.1 Legal Framework

The farm operates in the context of laws prescribing the regulatory safeguards in the tables below.

Table 2. Environmental documents and statutory requirements regulating the operations of CPA 21.

Document	Particulars	
Environmental Compliance Certificate (ECC)	Reference No.	ECC-R07-1505-0073
	Issuing Agency	DENR-EMB Region 7
	Date of Issuance	May 5, 2015
	Validity	- no expiration -
	Conditions	<ul style="list-style-type: none"> • area of operation: 182,247 sqm • maximum population: 20,000 heads
Discharge Permit for Water Pollution Source / Control Facilities	Reference No.	for renewal
	Issuing Agency	Application submitted to DENR-EMB Region 7
	Date of Issuance	Application submitted November 11, 2018
	Validity	NA
	Conditions	NA
Permit to Operate Air Pollution Source Control Installations	Reference No.	TPOA-16-H-072233-006
	Issuing Agency	DENR-EMB Region 7
	Date of Issuance	August 26, 2016
	Validity	November 26, 2016
	Conditions	<ul style="list-style-type: none"> • two units 320 kW Diesel Generator Set • two units 250 kW Diesel Generator Set • *documents for renewal submitted on November 21, 2018
Hazardous Waste Generator ID	Registration No.	M-GR-R7-22-03379
	Approving Agency	DENR-EMB Region 7
	Date of Approval	September 4, 2018
	Validity	NA
	Conditions	<ul style="list-style-type: none"> • Mercury and mercury compounds (busted fluorescent lamps); • Arsenic and its compounds (busted LED bulbs)
Water Permit	Reference No.	(For Application)

	Issuing Agency	National Water Resources Board
PCO Accreditation Certificate		

^ Environmental Management Bureau

a Self-Monitoring Report; b Compliance Monitoring Report

Table 3. Permits ensuring the safety of CPA 21's facilities and operation

Document	Particulars	
Business Permit	Permit No.	AVAILABLE and UP TO DATE
	Issuing Agency	
	Date of Issuance	
	Validity	
	Prerequisites	<ul style="list-style-type: none"> • Building Permit • Occupancy Permit • Zoning Clearance • Fire Clearance • Sanitary permit
Zoning Clearance	Registration No.	AVAILABLE and UP TO DATE
	Approving Agency	
	Date of Approval	
	Validity	
	Prerequisites	<ul style="list-style-type: none"> • Inspection of facility
	Conditions	•
Fire Clearance	Accreditation No.	AVAILABLE and UP TO DATE
	Issuing Agency	
	Date of Issuance	
	Validity	
	Prerequisites	<ul style="list-style-type: none"> • Microbial water analysis • Pest control • Health certificate of employees
	Conditions	•
Sanitary Permit	Reference No.	• AVAILABLE and UP TO DATE
	Issuing Agency	•
	Date of Issuance	•
	Validity	•
	Prerequisites	•
	Conditions	•

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.
- ↪ Biodigesters have been constructed with durable materials.
- ↪ 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 is registered as hazardous waste generator and is able to dispose through accredited TSD (transport, storage, disposal) providers.
- ↪ Currently, pig carcasses are placed in a mortality pit.

Odor

- ↪ Treatment in the WWTF-MRF has significantly abated odors coming from effluents.
- ↪ Trees have been planted within and around the farm.
- ↪ The farm houses pigs in tunnel-ventilated pig houses.
- ↪ 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 has started to 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 Plan of CPA 21

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	Engineering	PCO, Department head	-
		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	Farm manager	-
		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 - automated feeding system; - regular inspection and maintenance of feed delivery system	✓			quantify (dried) sludge produced	annually	amount of sludge produced	Farm personnel	Farm manager	Php 30,000 monthly
		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	Farm manager	Php 30,000 monthly
		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	Farm manager, PCO	Php 3,000 monthly
		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 personnel, Engineering	PCO, Farm manager, Department head	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	✓								Php 3,000 monthly
		pathological / infectious 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 personnel, Engineering	PCO, Department head	
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 personnel	PCO	Php 120,000 maintenance costs
		use of diesel with low sulfur content	✓								
		regular inspection and preventive maintenance of equipment	✓			emission testing	annually or every 5 years	emissions standards			
E. Risk of Environmental Degradation											
e.1 (risk of) surface water and groundwater quality degradation, disruption of soil properties, contamination	e.1.1 wastewater collection, transport, treatment, disposal	operates WWTF as prescribed	✓			effluent sampling and testing by an EMB-accredited laboratory	quarterly - more frequently during rainy seasons	effluent quality indicators: BOD, TSS, ammonia, phosphate (must meet standards for Class C effluent)	Farm personnel, Engineering	Farm Manager, PCO, Department head	Php 120,000 maintenance costs
		regular inspection and preventive maintenance of WWTF; regular desludging	✓								
		maintenance 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 3,000 monthly
		regular inspection and preventive maintenance of drying bed	✓								
		maintenance 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	Landscaping costs						
	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	Php 33,000 per month for maintenance						
F. Health and Safety – Anaerobic Digester System																	
f.1 explosion hazards	biogas collection, storage, combustion	No smoking or hot works in the vicinity of biogas facility				review inspection and maintenance records, incident reports, complaints register	monthly	number and details of explosion, fire incidents	Engineering,	Department head, Farm manager	Signage costs, Php 120,000 maintenance costs						
		Restrict access to biogas facility	✓	✓													
		Place signages															
		Regular maintenance of biogas system															
f.2 asphyxiation	biogas	Buddy system when conducting work				review incident reports	monthly	number and details of asphyxiation, poisoning incidents	Engineering	Department head, Farm manager, PCO	Php 120,000 maintenance costs						
		Restrict access to biogas facility	✓	✓													
		Regular maintenance of biogas system															
f.3 chemical hazards	sludge	Use appropriate PPE	✓	✓		review incident reports	monthly	number and details of infection, infestation incidents	Engineering	Department head, Farm manager	PPE costs						
						review results of health checks	annually										
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						
		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)	✓														
	f.1.3 decomposing materials (sludge and organic solids)	provision and use of appropriate PPE	✓														
		ensure sludge pile is well aerated, prevent waterlogging	✓														
	f.1.4 decomposing materials (placental materials and carcasses)	disposal through burial, composting	✓														
		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	Farm manager
provision and use of appropriate PPE			✓														
Maintains existing vegetation, will plant trees			✓														
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 personnel, admin officers	Farm manager	PPE costs Php 120,000 maintenance costs
		tunnel ventilation system prevents dust build 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)	✓							
	f.2.3 vehicles, machineries	provision and use of appropriate PPE	✓							
		sealing and damping of unpaved roads	✓							
		limits vehicular 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	PCO	Php 25,000 monthly pest control
		implement pest, vermin control measures (use of baits and traps)	✓							
		observes good housekeeping 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 personnel	PCO, Farm manager	Php 350 daily wage for technical personnel Equipment costs Php 25,000 monthly pest control
		provision and use of appropriate equipment for handling and storage of hazardous and infectious materials	✓							
		enforce, observe biosecurity measures, health and safety protocols	✓							
		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	PCO, Farm manager	Signage printing costs
		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	✓							
		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 personnel	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

2.2.4 Contingency Response

Below is an overview of CPA 21's 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 at the exterior of the farm are designated as evacuation areas for when an earthquake occurs.
- c. Outbreak
 - In the event of a livestock disease 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, CPA 21 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, CPA 21 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 farms requires all visitors to follow a 7-day decontamination procedure. Visitors are not allowed to visit the farm less than seven days from a visit to another pig farm. Visitors are also required to bathe and wear the farm's uniform during their time within CPA 21's premises. Vehicles entering the premises are also decontaminated using a chemical wash.

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, the farm manager and the farm's Pollution Control Officer (PCO), 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

Below are some of the Proponents efforts to ensure that CPA 21 does not infringe upon the social rights of its employees and the Farm's host community.

3.1 Consultation and Participation

Prior to construction, the Proponent, together with LBP-EPMD, identified the Project's stakeholders who were afterwards invited, through letters and notices, to a consultative meeting for the Project's establishment on February 12, 2016. The stakeholder consultation was attended by 26 individuals from various institutions including farm representatives, Landbank personnel, and barangay officials.

All relevant information, especially those that pertain to the Project's environmental and social impacts, were communicated to the stakeholders during the consultations. Issues and queries raised all satisfactorily addressed by the Proponent and the other presenters.

3.2 Grievance Redress Mechanism

The Farm's manager and PCO are hereby designated to be the main contact person for stakeholders regarding grievances, feedbacks, and queries related to the Project. He is 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.

Issues not resolved at the Project level (by the Proponent) will be raised to the following third party institutions for arbitration and possible resolution:

- Office of the Barangay Chairman
All complaints shall be initially entertained and attempted to be resolved in the *barangay* where the Farm is situated. The *barangay* 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 any 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 (including at the Farm's main gate). For the Project of CPA 21 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

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 DENR-EMB Region 7 and will also be available in Barangay Sacsac's office, in LANDBANK's library (1598 M.H. Del Pilar cor Dr. J. Quintos St., Malate, Manila, Philippines), and in World Bank's Infoshop.

3.4 **Equal Opportunity**

CPA 21 is an equal opportunity employer, not regarding gender, age, disability, and ethnicity in evaluating and hiring potential employees. The farm currently employs 104 personnel (77 males and 27 females). Males are generally assigned to work in maintaining the pig houses and handling pigs. Whereas females are assigned to the farrowing houses, and have administrative duties.

3.5 **Resettlement**

The Project is located inside the premises owned by CPA 21, 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 CPA 21 receive standard basic salary (at the minimum), 13th month pay, free on-site lodging and meals, sick and vacation leaves, health insurance, as well as SSS (social security), HDMF (housing loan) and health insurance privileges.

4 ESMP REVIEW AND UPDATING

This ESMP shall be reviewed and updated as needed to keep pace with and adapt to changes and developments related to the Project. The Farm's manager and PCO shall initiate and lead this initiative in consultation with relevant Farm personnel and Project partners.

5 INSTITUTIONAL ARRANGEMENTS

5.1 The Proponent

The Proponent will be responsible in all 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 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
- disseminate all relevant information to stakeholders

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 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 CPA 21 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 (DOE), 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 donors and 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 on-site 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 (ERPA) between LBP and World Bank

LBP shall assist the Proponent in its implementation of the Project based on LBP's Safeguards Framework and on 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 (UNFCCC).

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 an MMT) the periodic compliance and impact monitoring of the Project, including the fulfillment of 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 (ECC).

5.4 **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 appraisal reviews on the Project's safeguard 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

Proposed Biogas System for Piggery Wastewater Treatment Plans and Specifications

CD - Hybrid Biogas System

By:



Technology Principal:
Energy Research and Development
Institute – Nakornping
Chiang Mai University, Thailand

Local Implementor:
Alterna Verde Corporation
Saguin, City of San Fernando,
Pampanga, Philippines, 2000
Tel. No. (045) 455-0023

Business Principal:
Tetra Products and Consulting Corp.
Athene Tower, Wireless Road,
Lumpine, Pathumwan, Bangkok, Thailand

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC
WORKS AND HIGHWAYS
OFFICE OF THE
BUILDING OFFICIAL
MUNICIPALITY OF
PINAMUNGAJAN, CEBU

BUILDING OFFICIAL

LAND USE & ZONING

LINE & GRADE

ARCHITECTURAL

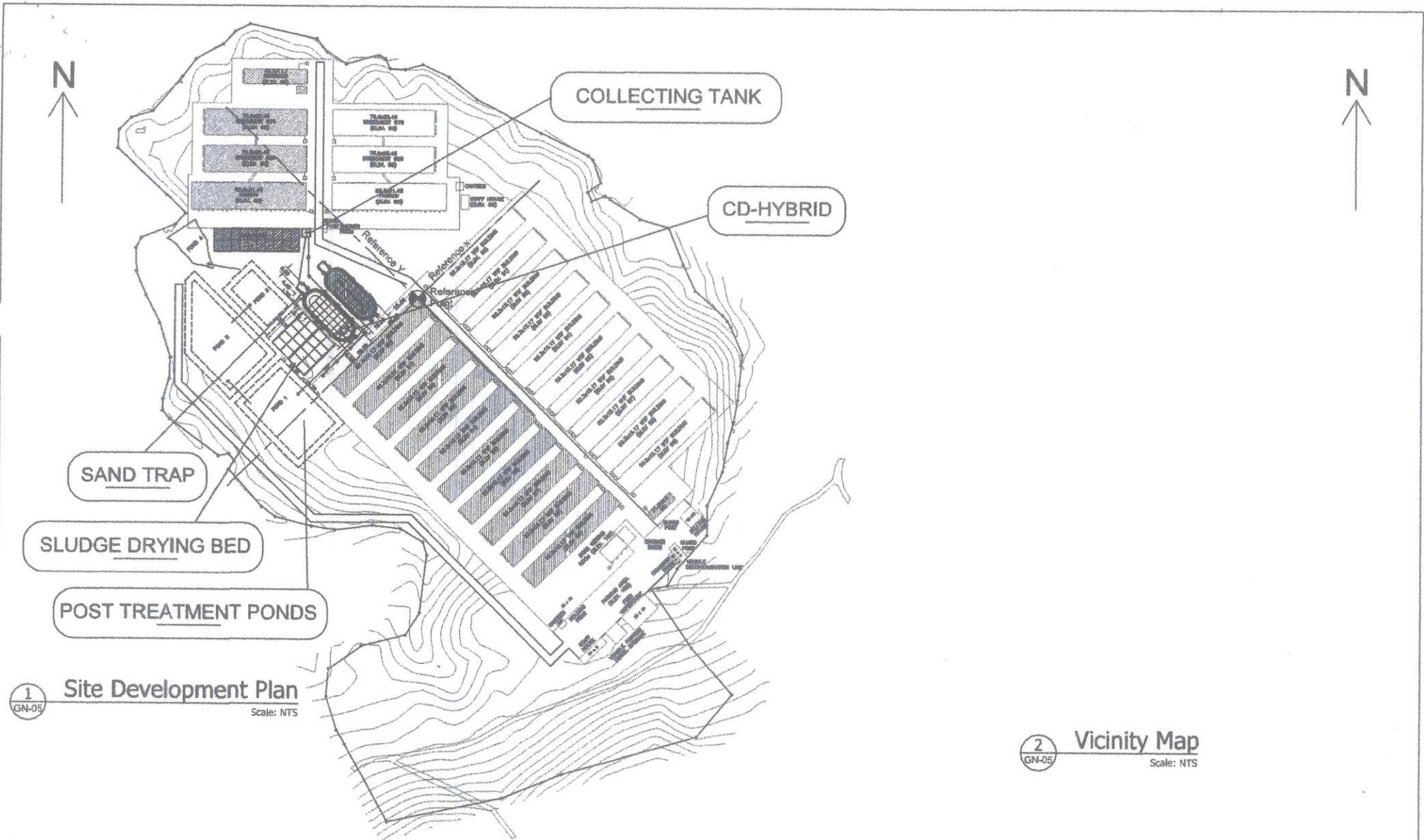
STRUCTURAL

ELECTRICAL

MECHANICAL

SANITARY

FIRE DEPARTMENT

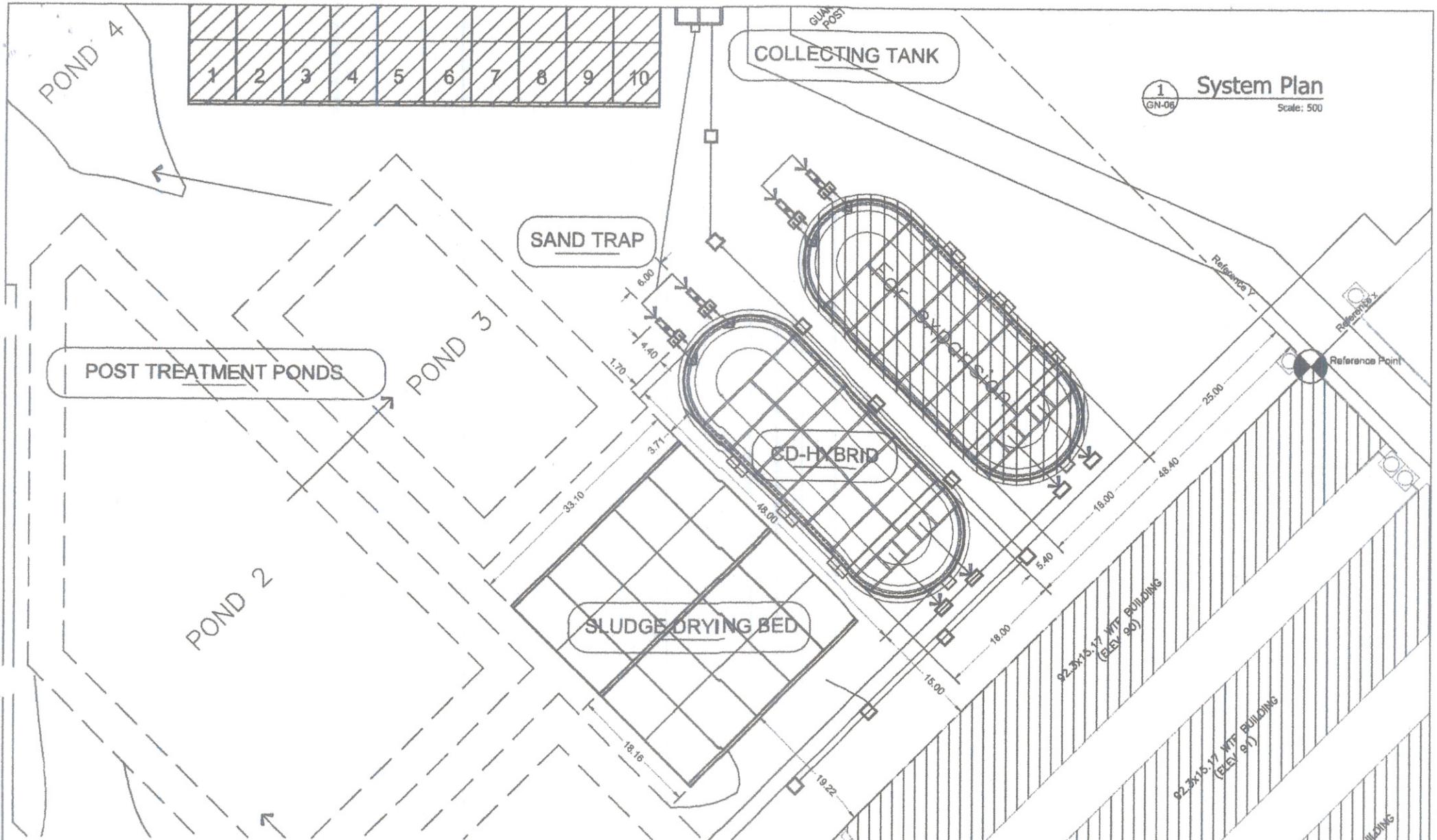


1 Site Development Plan
GN-05 Scale: NTS

2 Vicinity Map
GN-05 Scale: NTS

Technology Principal: Energy Research and Development Institute- Nakamying, Chiang Mai University, Thailand Business Principal: Tetra Products and Consulting Corporation Athene Tower, Pathumwan, Bangkok, Thailand Local Implementer: Alterna Verde Corporation L2B2, Rockwood Homes, Brgy Saguin, City of San Fernando Pampanga	Project Leaders: Engr. Alongkorn Sirlpat & Engr. Jaykie Homer P. Hernandez		Scaled As Shown Sheet Contents: Site Development Plan; Vicinity Map								
	TH Civil/Structural Engineer: Wongthep Tangsirikul TH Environmental Engineer: Alongkorn Sirlpat	TH Electrical Engineer: Krie Likit-Anurak TH Mechanical Engineer: Sarawoot Amardara		Revision <table border="1"> <thead> <tr> <th>No.</th> <th>Date</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>9/11/2015</td> <td>Location of CT, and the first CD to be constructed</td> </tr> </tbody> </table>		No.	Date	Details	1	9/11/2015	Location of CT, and the first CD to be constructed
No.	Date	Details									
1	9/11/2015	Location of CT, and the first CD to be constructed									
JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer		PRC Reg. No.: 6618 PTR No.: 2485044 Valid Until: March 2018 Place Issued: Taguig City	PRC Reg. No.: PTR No.: Valid Until: Place Issued:	Approved by: Paul Holayan Date: Aug 30, 2015 Total Pages: 44	GN-05						

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1 System Plan
Scale: 500
GN-06

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Energy Research and Development Institute-
Nakomping, Chiang Mai University, Thailand

Business Principal:
Tetra Products and Consulting Corporation
Athens Tower, Pathumwan, Bangkok, Thailand

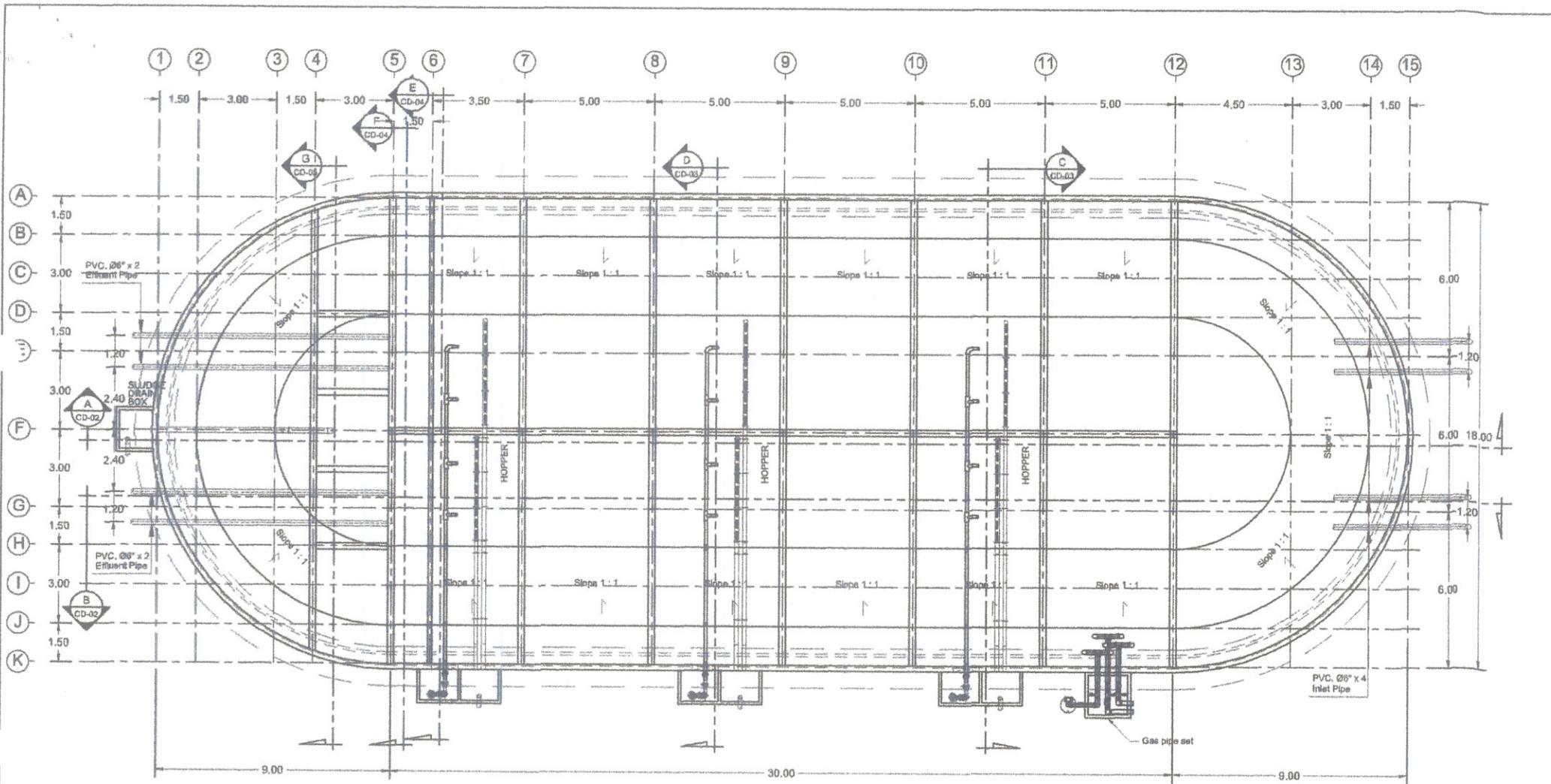
Local Implementer:
Altima Verde Corporation
L2B2, Rockwood Homes, Brgy Saguin,
City of San Fernando Pampanga

Project Leaders: Engr. Alangkorn Siripat & Engr. Jaykie Homer P. Hernandez	
TH Civil/Structural Engineer: Wangthep Tangsilakul	TH Electrical Engineer: Kris Likit-Anurak
TH Environmental Engineer: Alangkorn Siripat	TH Mechanical Engineer: Sarawat Amornara
JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer	
PRC Reg. No.: 6618	PTR No.: 2485044
Valid Until: March 2018	Place Issued: Taguig City

Scaled As Shown	Sheet Contents: System Plan	
	Revision	
No.	Date	Details
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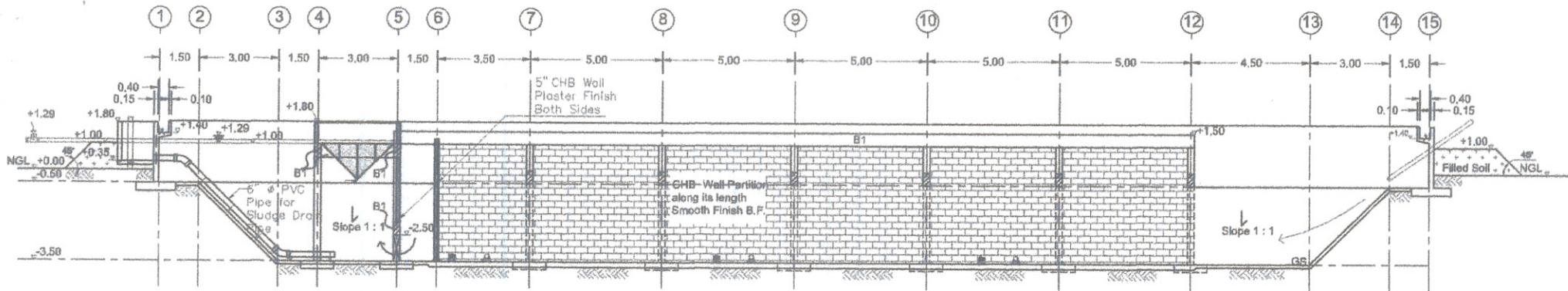
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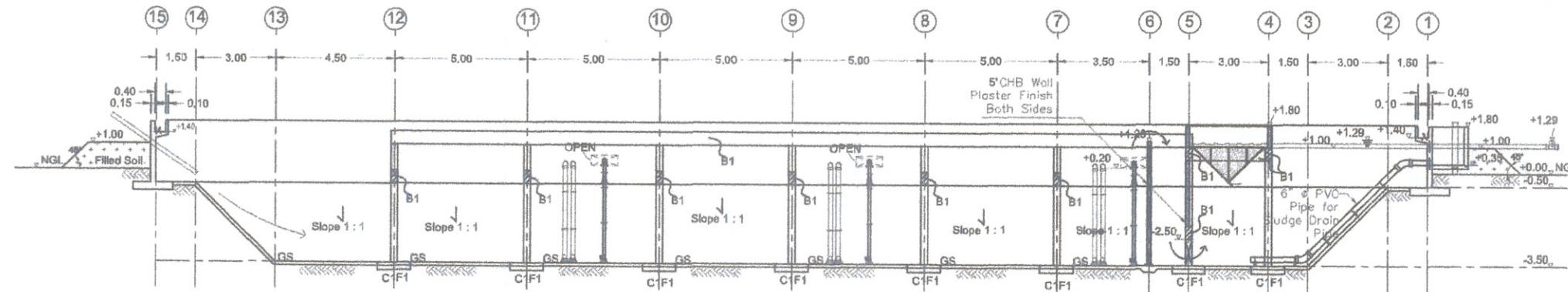


1
CD-HYBRID PLAN
 Scale: 1:150

<p>Technology Principal: Energy Research and Development Institute- Nakornping, Chiang Mai University, Thailand</p> <p>Business Principal: Tetra Products and Consulting Corporation Athene Tower, Pathumwan, Bangkok, Thailand</p> <p>Local Implementer: Alterno Verde Corporation L2B2, Rockwood Homes, Brgy Saguin, City of San Fernando Pampanga</p>	<p>Project Leaders: Engr. Alongkorn Siripat & Engr. Jaykie Homer P. Hernandez</p> <p>TH Civil/Structural Engineer: Wongthep Tongelrikul TH Electrical Engineer: Krie Likit-Anurak</p> <p>TH Environmental Engineer: Alongkorn Siripat TH Mechanical Engineer: Sarawat Amardara</p>	<p>Scaled As Shown</p>	<p>Sheet Contents: CD-HYBRID PLAN</p>							
	<p>JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer</p>	<p>Revision</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">No.</th> <th style="width: 10%;">Date</th> <th style="width: 80%;">Details</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No.	Date	Details				<p>Checked by:</p> <p>Approved by: Paul Holayean</p> <p>Date: Aug 30, 2015</p>	<p>Sheet No.</p> <p>CD-01</p>
No.	Date	Details								
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1 SECTION A-A
CD-02 Scale: 1:150



2 SECTION B-B
CD-02 Scale: 1:150

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Energy Research and Development Institute-
Nakomping, Chiang Mai University, Thailand

Business Principal:
Tetra Products and Consulting Corporation
Athens Tower, Pathumwan, Bangkok, Thailand

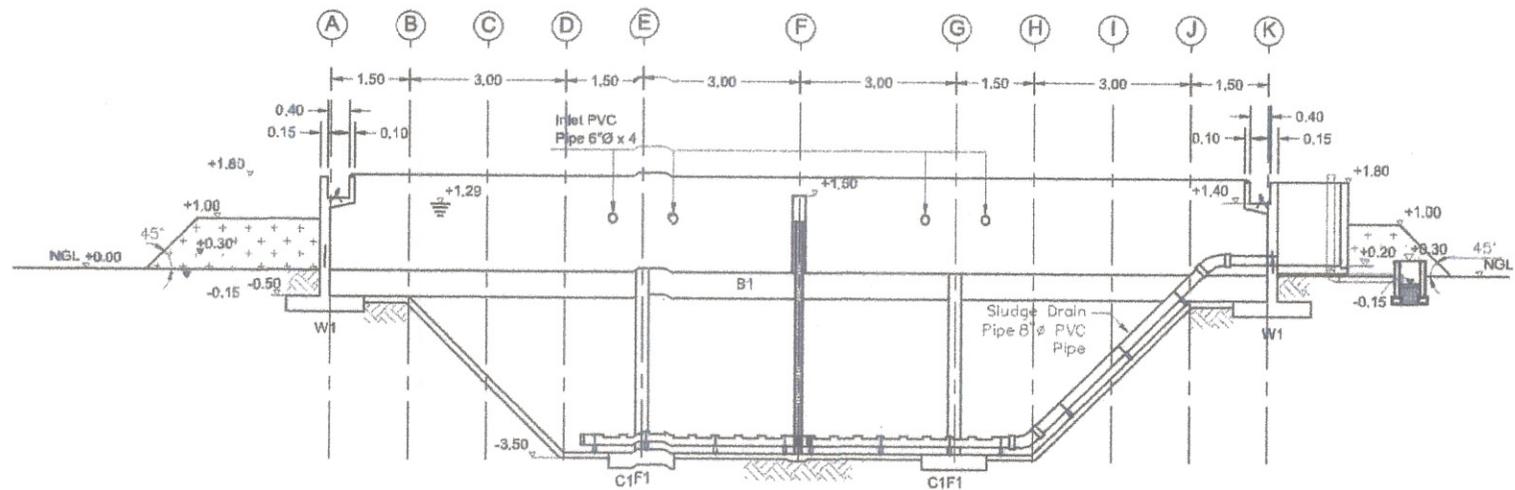
Local Implementer:
Alterna Verde Corporation
L2B2, Rockwood Homes, Brgy Saguin,
City of San Fernando Pampanga

Project Leaders: Engr. Alongkorn Siripat & Engr. Jaykie Homer P. Hernandez			
TH Civil/Structural Engineer: Wongthep Tangsirikul		TH Electrical Engineer: Kris Ukkit-Anurak	
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JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer			
PRC Reg. No.: 6618	PTR No.: 2485044	PRC Reg. No.:	PTR No.:
Valid Until: March 2018	Place Issued: Taguig City	Valid Until:	Place Issued:

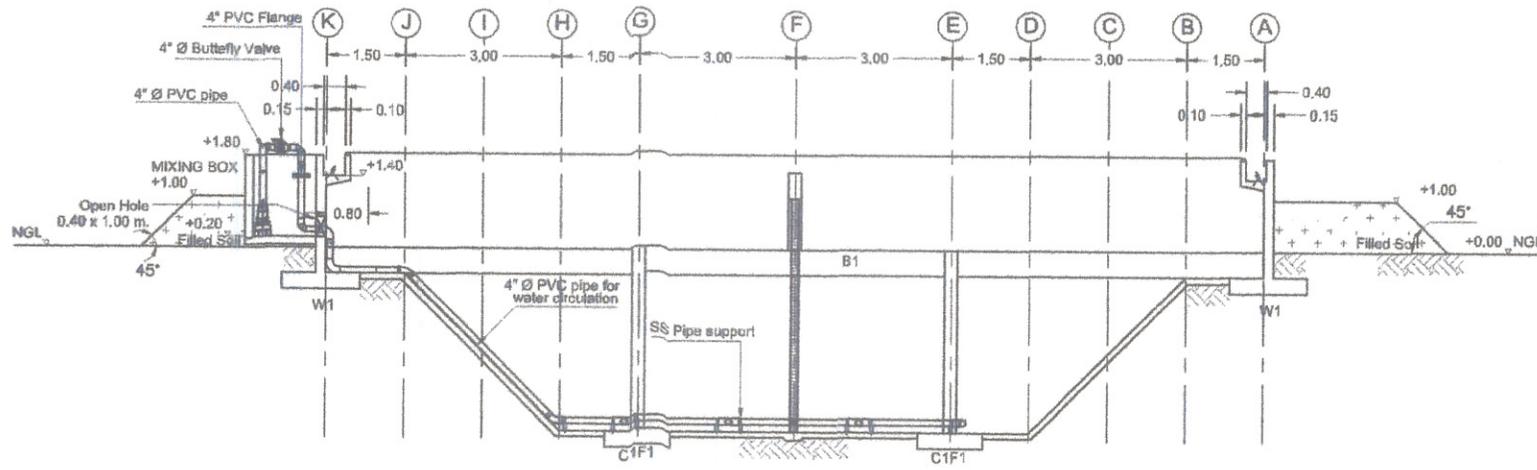
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	Revision		
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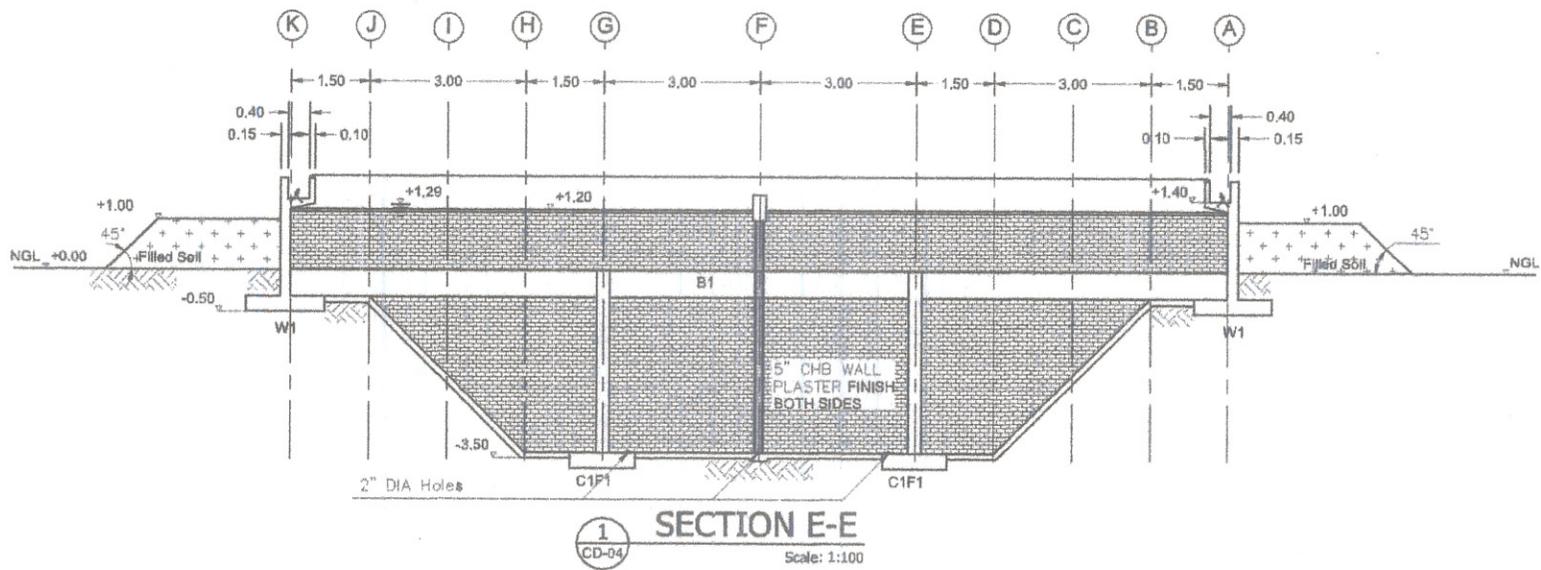
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SECTION C-C
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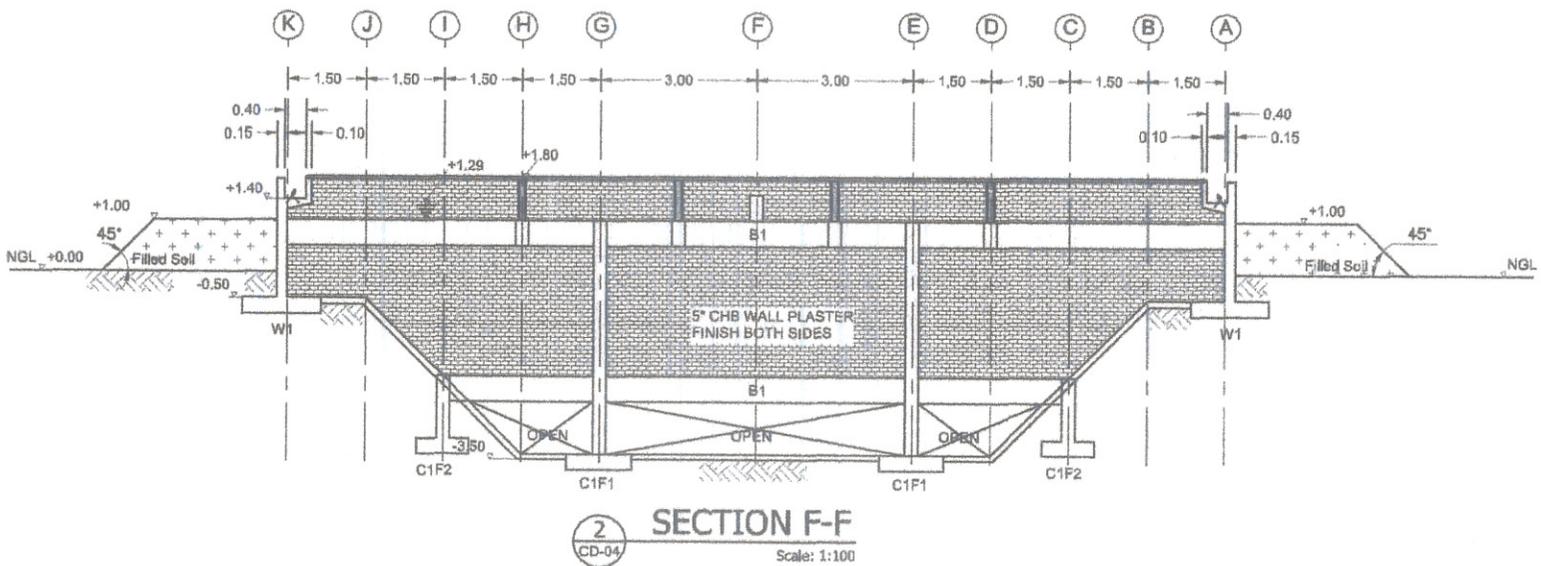
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CD-03
SECTION D-D
Scale: 1:100

Technology Principal: Energy Research and Development Institute- Nakomping, Chiang Mai University, Thailand Business Principal: Tetra Products and Consulting Corporation Athene Tower, Pathumwan, Bangkok, Thailand Local Implementer: Alterna Verde Corporation L2B2, Rockwood Homes, Birgy Saguin, City of San Fernando Pampanga	Project Leaders: Engr. Alongkorn Stripat & Engr. Jaykie Homer P. Hernandez		Scaled As Shown Sheet Contents: SECTION C-C; SECTION D-D	Checked by: _____ Approved by: Paul Holaysan Date: Aug 30, 2015	Sheet No. CD-03
	TH Civil/Structural Engineer: Wangthep Tangsilakul	TH Electrical Engineer: Kris Likit-Anurak			
	TH Environmental Engineer: Alongkorn Stripat	TH Mechanical Engineer: Sarawat Amornara	Revision		
JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer			No. _____	Date _____	Details _____
PRC Reg. No.: 6618 Valid Until: March 2018	PTR No.: 2485044 Place Issued: Taguig City	PRC Reg. No.: _____ Valid Until: _____	PTR No.: _____ Place Issued: _____	Total Pages: 44	

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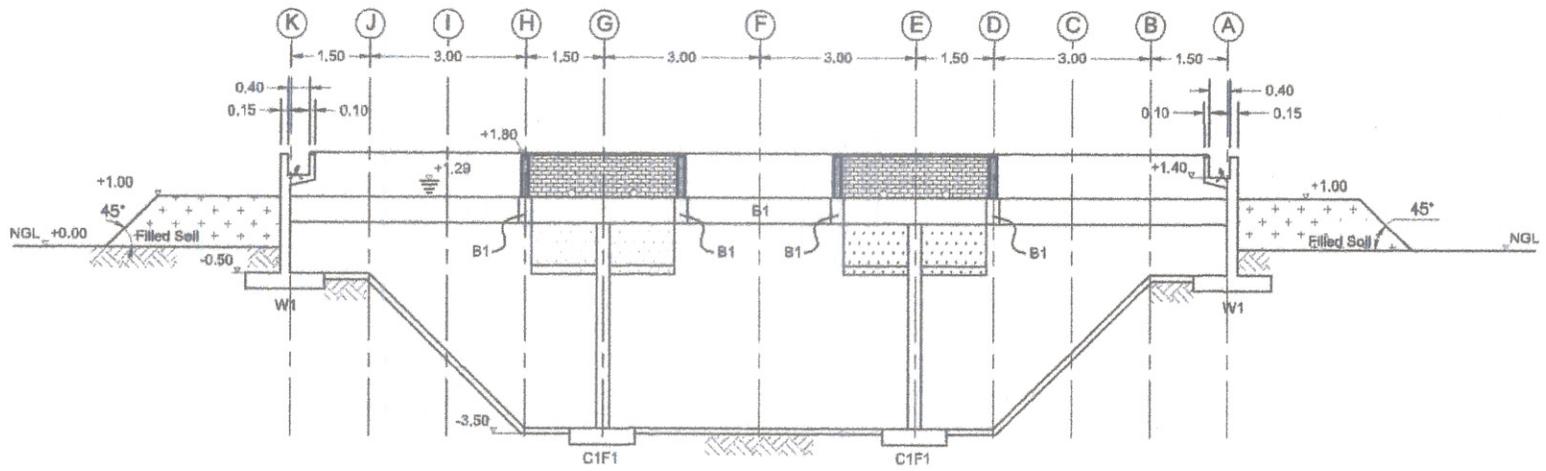
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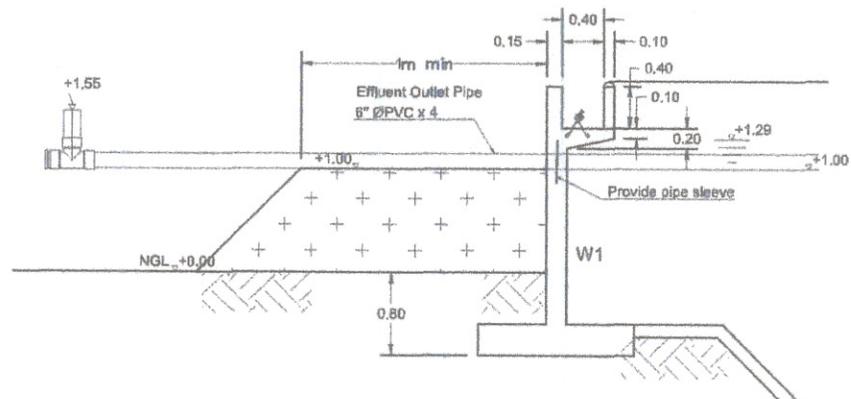
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Technology Principal: Energy Research and Development Institute Nakompong, Chiang Mai University, Thailand 	Project Leaders: Engr. Alongkorn Siripat & Engr. Jaykie Homer P. Hernandez		Scaled As Shown	Sheet Contents: SECTION E-E; SECTION F-F		Checked by: Approved by: Paul Halayean Date: Aug 30, 2015	Sheet No. CD-04				
	TH Civil/Structural Engineer: Wangthep Tangsirikul	TH Electrical Engineer: Kris Likit-Anurak		Revision							
Business Principal: Tetra Products and Consulting Corporation Athene Tower, Pathumwan, Bangkok, Thailand 	TH Environmental Engineer: Alongkorn Siripat	TH Mechanical Engineer: Sarawoot Amarndara	<table border="1"> <thead> <tr> <th>No.</th> <th>Date</th> <th>Details</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		No.	Date	Details				Total Pages: 44
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Local Implementer: Alterra Verde Corporation L2B2, Rockwood Homes, Brgy Saguin, City of San Fernando Pampanga 		PRC Reg. No.: 6618 PTR No.: 2485044	PRC Reg. No.: PTR No.:	Valid Until: March 2018 Place Issued: Taguig City	Valid Until: Place Issued:						

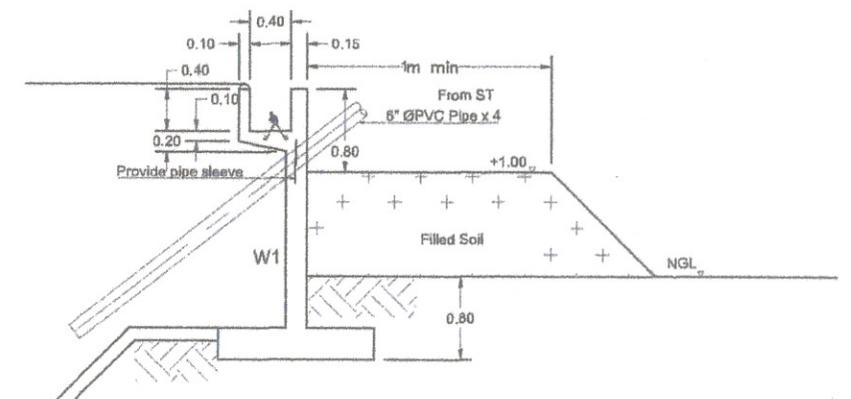
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1 SECTION G-G
CD-05 Scale: 1:100



2 DETAILS OF OUTLET PIPE
CD-05 Scale: 1:50



3 DETAILS OF INLET PIPE
CD-05 Scale: 1:50

Technology Principal:
Energy Research and Development Institute-
Nakamping, Chiang Mai University, Thailand

Business Principal:
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Local Implementer:
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JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer	
PRC Reg. No.: 6618	PTR No.: 2485044
Valid Until: March 2018	Place Issued: Taguig City

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	Revision		
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P-02

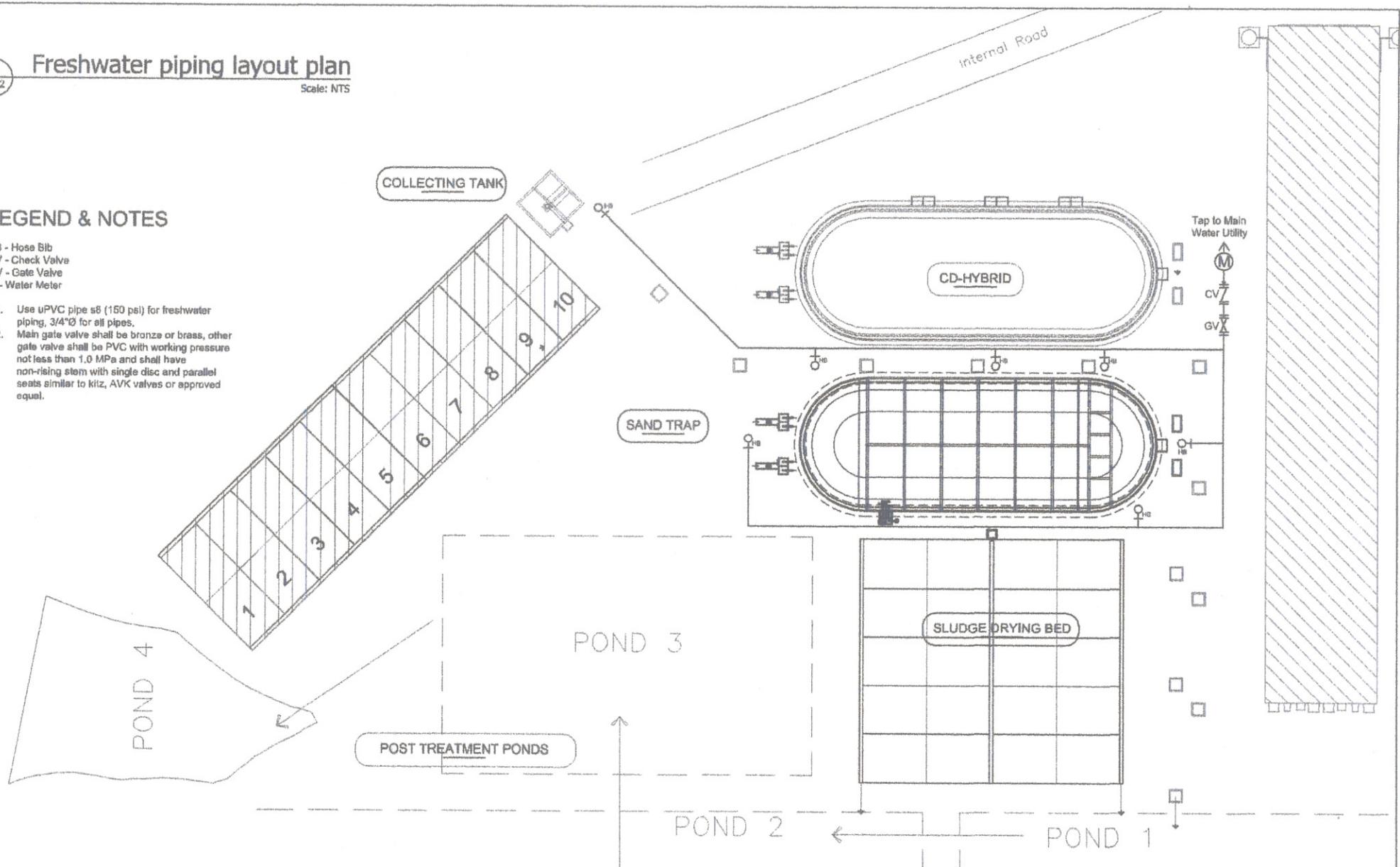
Freshwater piping layout plan

Scale: NTS

LEGEND & NOTES

HB - Hose Bib
CV - Check Valve
GV - Gate Valve
M - Water Meter

1. Use uPVC pipe s8 (150 psi) for freshwater piping, 3/4"Ø for all pipes.
2. Main gate valve shall be bronze or brass, other gate valve shall be PVC with working pressure not less than 1.0 MPa and shall have non-rising stem with single disc and parallel seats similar to Kitz, AVK valves or approved equal.



Technology Principal:
Energy Research and Development Institute-
Nakomping, Chiang Mai University, Thailand



Business Principal:
Tetra Products and Consulting Corporation
Athene Tower, Pathumwan, Bangkok, Thailand



Local Implementer:
Alterna Verde Corporation
L2B2, Rockwood Homes, Brgy Saguin,
City of San Fernando Pampanga

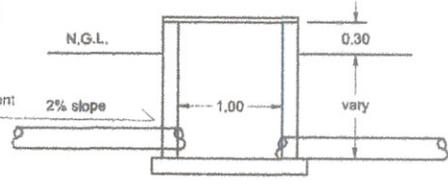
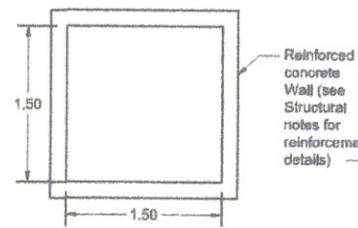
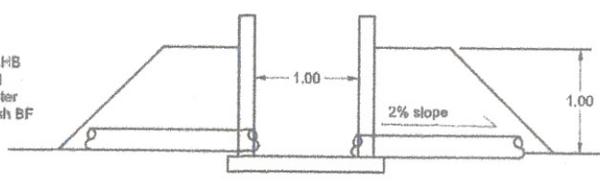
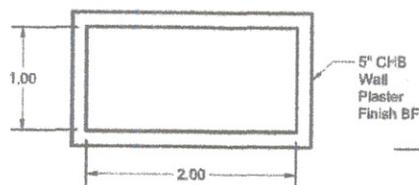
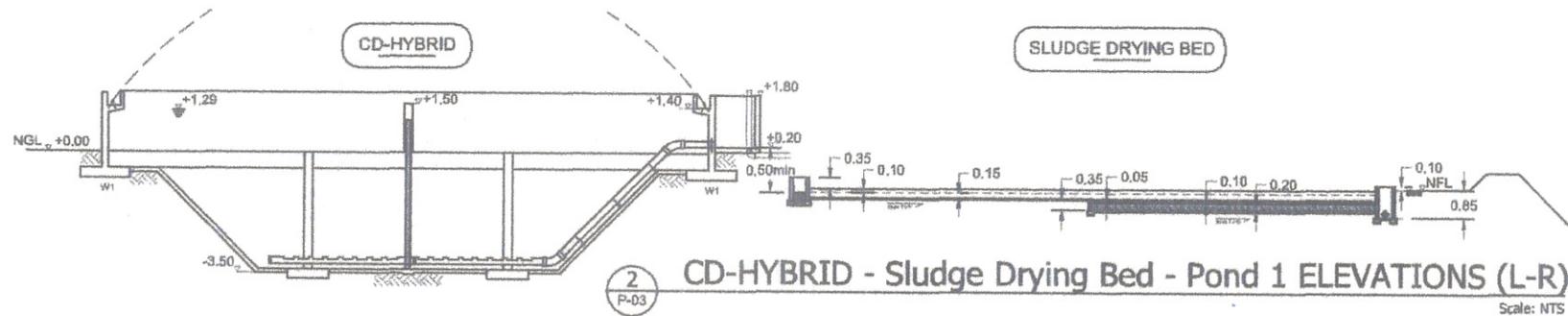
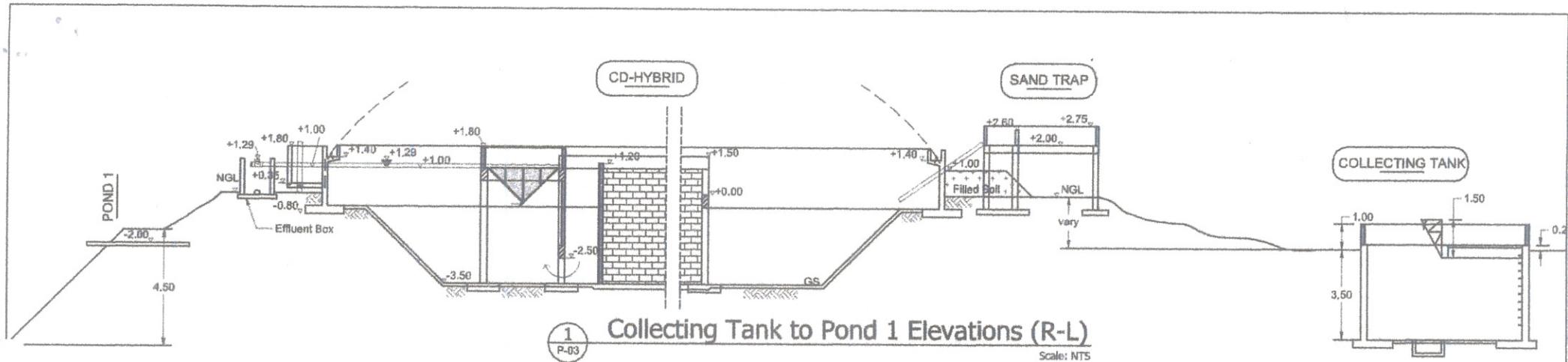


Project Leaders: Engr. Alongkorn Siripat & Engr. Jaykle Homer P. Hernandez	
TH Civil/Structural Engineer: Wongthep Tangairakul	TH Electrical Engineer: Kris Likit-Anurak
TH Environmental Engineer: Alongkorn Siripat	TH Mechanical Engineer: Sarawat Amardara
--- Master Plumber / Sanitary Engineer	
PRC Reg. No.:	FTR No.:
Valid Until:	Place Issued:

Scaled As Shown	Sheet Contents: Freshwater piping layout plan	
	Revision	
	No.	Date
1	9/11/2015	Location of CT, and the first CD to be constructed

Checked by:	Sheet No.
Approved by: Paul Holayean	P-02
Date: Aug 30, 2015	Total Pages:

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Technology Principal:
 Energy Research and Development Institute - Nakomping, Chiang Mai University, Thailand

Business Principal:
 Tetra Products and Consulting Corporation
 Athene Tower, Pathumwan, Bangkok, Thailand

Local Implementer:
 Alterna Verde Corporation
 L2B2, Rockwood Homes, Brgy Seguin, City of San Fernando Pampanga

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Project Leaders: Engr. Alongkorn Siripat & Engr. Jaykie Homer P. Hernandez			
TH Civil/Structural Engineer: Wongthep Tangsirikul		TH Electrical Engineer: Kria Likit-Anurak	
TH Environmental Engineer: Alongkorn Siripat		TH Mechanical Engineer: Sarawat Amornara	
--- Master Plumber / Sanitary Engineer			
PRC Reg. No.:	PTR No.:	PRC Reg. No.:	PTR No.:
Valid Until:	Place Issued:	Valid Until:	Place Issued:

Scaled As Shown	Sheet Contents: Collecting Tank to Pond 1 Elevations (R-L); CD-HYBRID - Sludge Drying Bed - Pond 1 ELEVATIONS (L-R); EB Plan; EB Elevation; CB Plan; CB Elevation		
	Revision		
No.	Date	Details	

Checked by:	Sheet No.
Approved by: Paul Holayan	P-03
Date: Aug 30, 2015	Total Pages:

Appendix B. Health and Safety Risks Management Plan of CPA 21

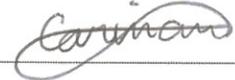
Hazard	Possible Harm	Source / Cause	Prevention / Minimization	Person/s Responsible
physical				
Noise	discomfort, hearing damage	pig squeals	<ul style="list-style-type: none"> - pigs consistently feed to prevent stress - tunnel ventilated pig houses confine noise - PPEs (ear protection) 	Farm Personnel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

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"> - proper labeling, containers, and storage - restrict access to chemical and hazardous waste storage - train staff (handling hazardous substances and wastes; review MSDS / product information sheets) - only competent staff should administer veterinary medicines - ensure first aid kits are readily available - PPEs (gloves, eye glasses) 	Farm Manager PCO
biological				
pathogens / infectious agents, toxins and other products	various infectious diseases, parasites, irritation	pathological materials / tissues	<ul style="list-style-type: none"> - proper disposal of animal and veterinary wastes (see Table 5) - quarantine measures - good housekeeping practices (disinfection) - practice hygienic practices (especially hand hygiene) - workers' regular health examination - train staff (animal handling, proper waste handling and disposal) - PPEs (gloves, etc) 	Veterinarians 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"> - proper disposal of odororous wastes (see Table 5) - good housekeeping practices - keep an acceptable number of cats at the farm - pest control 	Farm Personnel PCO
ergonomic				
ergonomic stress	ergonomic injuries	repetitive actions, forceful exertions, sustained awkward posture	<ul style="list-style-type: none"> - use aid of appropriate equipment for lifting/moving heavy objects - use of proper lifting techniques - buddy system - job rotation / adequate rest (in between tasks) 	Farm Manager Farm Personnel
		improper use of equipment	<ul style="list-style-type: none"> - train staff (consult manuals) 	Farm Manager Farm Personnel
		use of faulty equipment	<ul style="list-style-type: none"> - repair or replace equipment 	Farm Manager Farm Personnel
other accidents and contingencies				
slips, trips, falls	injuries, wounds, contusions	spills (slips)	<ul style="list-style-type: none"> - proper maintenance of walkways - daily safety briefings and regular trainings - barricading of work areas - PPEs 	Farm Manager Farm Personnel
		various objects, debris (trips)		
		heights, slips (falls)		
entanglement	injuries, wounds, strangulation	machineries	<ul style="list-style-type: none"> - install machine guards - tie back long hair - wear long sleeve shirts - avoid wearing loose-fitting clothes and personal accessories - regular equipment inspection and maintenance 	Farm Manager Farm Personnel
blows, punctures	injuries, wounds, contusions	pig handling	<ul style="list-style-type: none"> - animal restraints - ensure enough space to maneuver - train staff (animal handling techniques) - wear appropriate PPE (boots, gloves etc) 	Farm Personnel
Sharps	sharps injuries, wounds	veterinary activities, waste handling	<ul style="list-style-type: none"> - ensure only trained personnel conduct veterinary activities - PPEs (gloves, goggles) 	Farm Manager PCO
fires	Burns	faulty electrical systems, explosions, fugitive gases, accidental ignition	<ul style="list-style-type: none"> - comply with requirements and regulations of fire authorities - provide adequate and proper (multipurpose) fire protection equipment - designate smoking areas away from digester, gas tanks, and electrical equipment and storage of combustible materials (compost, sludge, chemicals)) - regular clearing of vegetation near farm structures - signage and warnings - train staff (on contingency plan and proper equipment use) - regular inspection and maintenance of electrical systems and equipment 	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"> - keep sources of heat, including machineries, at a safe distance from biogas facility - prohibit smoking and use of cellphones around biogas system and gas storage facilities - regular inspection and maintenance of MRF - signage and warnings - consider the purchase of gas monitoring equipment 	Farm Manager Farm Personnel
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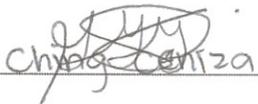
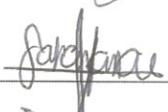
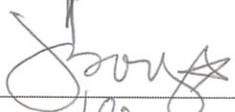
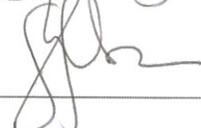
**EXCELSIOR FARMS, INC. – BIOGAS PROJECT
 CLEAN DEVELOPMENT MECHANISM (CDM)
 Methane Recovery and Combustion from Animal Waste Management System
 Stakeholders' Consultation**

February 12, 2016

Name	Organization / Affiliation	Address	Contact Numbers	Signature
AGUSTIN LEYSON		CAG-SAC		
Emmanuel Bayad	Resident	Davao		
Kathlyn Dizon	Resident	Pinamungajan	09420258169	K dizon
Apple Jane Acosta	Resident	Pinamungajan	09330449027	
Angelica Cariman	Resident	Pinamungajan	09436619060	
Ma. Jugin Baring	Resident	Pinamungajan	09067832833 0926	M. Baring ...
Jox C. Diaz, Jr.	DBS	Malate	09202472607	
Proa M. Esguerra	LMP	Aban City	6947-422755	Proa M. Esguerra
AMELITO SEGARRA	LBP	TANDALUYONGS CITY	09178662056	A. Segarra
Emmanuel Caritic	Excelsior	Davao		

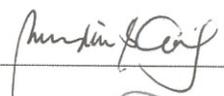
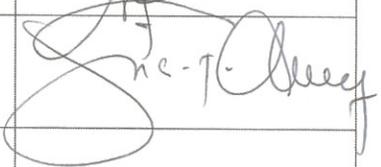
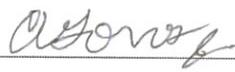
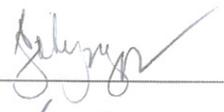
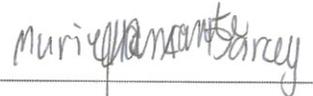
**EXCELSIOR FARMS, INC. – BIOGAS PROJECT
 CLEAN DEVELOPMENT MECHANISM (CDM)
 Methane Recovery and Combustion from Animal Waste Management System
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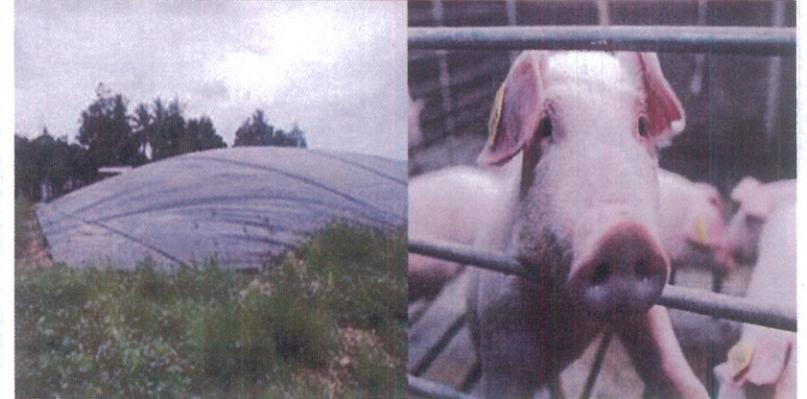
February 12, 2016

Name	Organization / Affiliation	Address	Contact Numbers	Signature
Ching L. Ceniza	Resident	Pinamungajan, ^{Cebu}	09324767268	
Ella Jean L. Baricuatto	Resident	Pinamungajan, Cebu		
Hannah A. Esok	Resident	Pinamungajan, Cebu	09183013267	
Johara Mae P. Galatero	Resident	Pinamungajan Cebu	09224441766	
Rebeby Hervas	Excelsior	Pinamungajan, Cebu	09179860538	
LOWELL LABOR	EXCELSIOR	PINAMUNGAJAN	09178200380	
CHAD VILLAMIN	EXCELSIOR	PINAMUNGAJAN	09267409654	
Renita Fajardo	Excelsior	Pinamungajan		

**EXCELSIOR FARMS, INC. – BIOGAS PROJECT
CLEAN DEVELOPMENT MECHANISM (CDM)
Methane Recovery and Combustion from Animal Waste Management System
Stakeholders' Consultation**

February 12, 2016

Name	Organization / Affiliation	Address	Contact Numbers	Signature
Mary June Gempisan	LGU - Mun. Agr. office	Pob. Pina. Cebu	09222539074	
Bernadette B. Ati	Municipal Health Office	Pinamungajan, Cebu	09152496086	
Coronelita Yape	LGU - Mun. Agric. off.	Talay, Pina. Cebu	09092375534	
JULIUS ERWIN ALDAS	LGU - SB MEMBER	MANGOTO, PINA ,	09473443746	
ALFONSO GONZALEZ	J.O	GUMBAW - AM	09224951955	
Josephine Benoy		Pinamungajan, Cebu	09057719981	
Jiselle Mae D. Dejita	L.G.U. Mun. Engr. Dept.	Pob.	09156356873	
Murielle A. Darcy		Pinamungajan, Cebu		



Stakeholders' Consultation

PROGRAM

Registration 1:30 - 2:00 pm
Opening Program 2:00 - 2:15 pm

LANDBANK 2:16 – 3:00 pm
*Climate Change and Clean
Development Mechanism* **Jose C. Diaz, Jr.**
CES, EPMD

Carbon Finance Support Facility.. **Amelito Segarra, Jr.**
Program Officer, EPMD

Snacks 3:00 - 3:15 pm

BIOGAS Project Consultant/Biogas Supplier

*Environmental Management
Plan & Benefits* Farm Manager
Excelsior Farms

OPEN FORUM 4:00 – 5:00 pm
Closing Remarks

January 27, 2015

HON. GLENN F. BARICUATRO
Municipal Mayor
Poblacion, Pinamungajan, Cebu 6039

Municipality of Pinamungajan
Pinamungajan, Cebu

RECEIVED
Mayor's Office

01/29/15
11:45 AM

Dear Sir:

Warm Greetings!

The Excelsior Farms, Inc., in cooperation with the Land Bank of the Philippines, will conduct a Stakeholder Consultation for the Clean Development Mechanism (CDM) proposed Methane Recovery and Combustion System. This activity will be conducted on February 12, 2016, 1:00pm-5:00pm at 2nd Floor, Municipal Hall, Pinamungajan, Cebu.

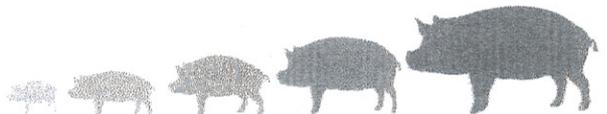
Key points on CDM and in-depth information on the project, such as Environmental Management Plan and Sustainable Development benefits, will be presented. An open forum will be held after the presentation to allow participants to raise inquiries and clarification on the proposed CDM project.

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

Should you need more information or confirmation of your attendance, please feel free to contact us at tel. no(s). (032) 316-3864 or 0917-620-5598.

Hope to hear your favorable reply.

Thank you.



January 27, 2016

GINOONG JODJET L. MANGUILIMOTAN

Punong Barangay

Barangay Sacsac, Pinamungajan, Cebu 6039

Mahal naming Punong Barangay Jodjet L. Manguilimotan:

Pagbati!

Kami po sa Excelsior Farms Inc., sa pakikipag-ugnayan at pakikipagtulungan ng Land Bank of the Philippines, ay magdaraus ng isang pampublikong konsultasyon sa mga kinauukulan o stakeholders na malapit sa aming mga proyekto upang mapag-usapan ang plano naming pagtatayo ng Biogas Project. Ito po ay magaganap sa ika 12th ng buwang Pebrero, 2016 sa ganap na ala-una ng hapon (1:00pm) sa 2nd Floor, Municipal Hall, Pinamungajan, Cebu.

Kasama po sa mga mahalagang paksang pag-uusapan ay ang tungkol sa Clean Development Mechanism, Environmental Management Plan, at mga benepisyong maidudulot ng aming Biogas Project. Magkakaroon din po ng maikasing palitan ng mga kuro-kuro, suhestyon, paglilinaw at rekomendasyon patungkol sa nabanggit na proyekto.

Dahil po dito, kami po ay malugod na nag-aanyaya sainyo na dumalo sa mahalagang pagpupulong na ito. Kalakip sa liham na ito ay ang programa ng mga paksang pag-uusapan natin.

Maaari po kayong makipag-ugnayan sa amin sa telepono numero (032) 316-3864 o 0917-620-5598 para sa mga detalye ng nasabing konsultasyon.

Maraming Salamat po!



2-2-14

KONSEHAL T-TINUYAN LEYSON

February 9, 2016

MR. BENITO FERNANDEZ
Chairman, Agriculture Committee
Municipality of Pinamungajan, Cebu 6039

Dear Sir:

Warm Greetings!

The Excelsior Farms, Inc., in cooperation with the Land Bank of the Philippines, will conduct a Stakeholder Consultation for the Clean Development Mechanism (CDM) proposed Methane Recovery and Combustion System. This activity will be conducted on February 12, 2016; 1:00pm–5:00pm at Municipal Hall, Pinamungajan, Cebu.

Key points on 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 CDM project.

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

Should you need more information or confirmation of your attendance, please feel free to contact us at tel. no(s). 032-316-3864 or 09176205598.

Hope to hear your favorable reply.

Thank you.

62-15-16
By: *Susan Tigan*



January 27, 2016

Ginoo/Ginang BERNALYN BORLADO
Barangay Sacsac Resident
Sacsac, Pinamungajan, Cebu 6039

MS. BORLADO :

Received:

1. Bernalyn Borlado 02-11-16
2. Rosalita Daban 02-11-16
3. Lemy Zgnano
4. Casquejo, Judith
5. Perias, Meljen
6. LIPAPAO, MARY JOY
7. YLANAN, NYMPHA
8. LELIA Q. RESUNIA
9. _____
10. _____

Pagbati!

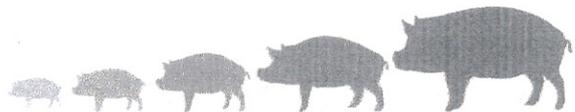
Ang Excelsior Farms, Inc. po sa pakikipag-ugnayan at pakikipagtulungan ng Land Bank of the Philippines, ay magdaraus ng isang pampublikong konsultasyon sa mga kinauukulan o stakeholders na malapit sa aming proyekto upang mapag-usapan ang plano naming pagtatayo ng Biogas Project. Ito po ay gaganapin sa Pebrero 12, 2016, sa ganap na ala-una ng hapon (1:00pm) sa 2nd Floor, Municipal Hall, Pinamungajan, Cebu.

Kasama po sa mga mahahalagang paksang pag-uusapan ay ang tungkol sa Clean Development Mechanism (CDM), Environmental Management Plan, at mga benepisyong maidudulot ng aming Biogas Project. Magkakaroon din po ng maikasing palitan ng mga kuro-kuro, suhestyon, paglilinaw at rekomendasyon patungkol sa nabanggit na proyekto.

Dahil po dito, malugod naming kayong inaanyayahan na dumalo sa nasabing konsultasyon o pagtitipon. Kalakip sa liham na ito ay ang programa ng mga paksang pag-uusapan natin.

Maaari po kayong makipag-ugnayan sa amin sa telepono numero (032) 316-3864 o 0917-620-5598 para sa mga detalye ng nasabing konsultasyon.

Maraming Salamat po!



NOTICE OF PUBLIC CONSULTATION

To All Concerned Stakeholders:

Stakeholder consultation on the Clean
Development Mechanism (CDM)
project/ Proposed Methane Recovery
and Combustion System (Biogas
Project) to be
conducted on:

DATE : FEBRUARY 12, 2016

TIME : 1:00PM – 5:00PM

VENUE : MUNICIPAL HALL,
PINAMUNGAJAN, CEBU

EXCELSIOR FARMS INC.
3/F Chua - Tiam Bldg. A del Rosario St.
Guizo Mandaue City Cebu

Received by: *[Signature]*
2/12/16

NOTICE OF PUBLIC CONSULTATION

To All Concerned Stakeholders:

Stakeholder consultation on the Clean
Development Mechanism (CDM)
project/ Proposed Methane Recovery
and Combustion System (Biogas
Project) to be
conducted on:

DATE : FEBRUARY 12, 2016

TIME : 1:00PM – 5:00PM

VENUE : MUNICIPAL HALL,
PINAMUNGAJAN, CEBU

2-4-16
Excelsior Farms Inc.

EXCELSIOR FARMS INC.
3/F Chua - Tiam Bldg. A del Rosario St.
Guizo Mandaue City Cebu

January 27, 2015

The Municipal Environmental and Natural Resources Officer
Municipality of Pinamungajan
Municipal Hall, Pinamungajan, Cebu 6039

Dear Sir/Madam:

Warm Greetings!

The Excelsior Farms, Inc., in cooperation with the Land Bank of the Philippines, will conduct a Stakeholder Consultation for the Clean Development Mechanism (CDM) proposed Methane Recovery and Combustion System. This activity will be conducted on February 12, 2016, 1:00pm-5:00pm at 2nd Floor, Municipal Hall, Pinamungajan, Cebu.

Key points on 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 CDM project.

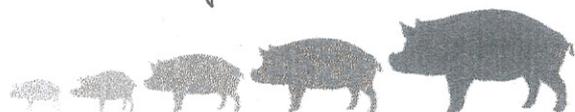
In this regard, we would like to invite a representative from your office to participate in the consultation. Attached is the agenda of the program.

Should you need more information or confirmation of your attendance, please feel free to contact us at tel. no(s). (032) 316-3864 or 0917-620-5598.

Hope to hear your favorable reply.

Thank you.

*Received
Pinamungajan
1/29/2016, 12:02 P.M.*



January 27, 2015

THE MUNICIPAL HEALTH OFFICER
Municipality of Pinamungajan, Cebu
Poblacion, Pinamungajan, Cebu 6039

Dear Sir/Madam:

Warm Greetings!

The Excelsior Farms, Inc., in cooperation with the Land Bank of the Philippines, will conduct a Stakeholder Consultation for the Clean Development Mechanism (CDM) proposed Methane Recovery and Combustion System. This activity will be conducted on February 12, 2016, 1:00pm-5:00pm at 2nd Floor, Municipal Hall, Pinamungajan, Cebu.

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Should you need more information or confirmation of your attendance, please feel free to contact us at tel. no(s). (032) 316-3864 or 0917-620-5598.

Hope to hear your favorable reply.

Thank you.

Received by: *[Signature]*
12/27/15
12:00 Noon



January 27, 2016

THE MUNICIPAL AGRICULTURAL OFFICER (MAO)
Municipality of Pinamungajan
Municipal Hall, Pinamungajan, Cebu 6039

Dear Sir/Madam:

Warm Greetings!

The Excelsior Farms, Inc. in cooperation with the Land Bank of the Philippines, will conduct a Stakeholder Consultation for our proposed Biogas Project on February 12, 2016, 1:00pm-5:00pm at 2nd Floor, Municipal Hall, Pinamungajan, Cebu.

Key points on 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 consultation. Attached is the agenda of the program.

Should you need more information or confirmation of your attendance, please feel free to contact us at tel. no(s). (032) 316-3864 or 0917-620-5598.

Hope to hear your favorable reply.

Thank you.



MINUTES OF STAKEHOLDERS' CONSULTATION

REGISTRATION OF PARTICIPANTS

1. Registration of participants was opened at 1:30PM. Actual conduct of Stakeholders' Consultation activity was started 3:00PM to allow for the arrival and attendance of as many participants as possible.
2. Thirteen (13) community members from Pinamungajan, Cebu attended the activity. These are mostly residents of various *sitios* in Barangay Sacsac, where the piggery farm of Excelsior Farms, Inc. is located.
3. Ms. Mary Jane Gempisan and Ms. Carmelita Yape represented the Municipal Agricultural office of the local government of Pinamungajan.
4. Ms. Jiselle Mae Dejito represented the Municipal Engineering Department of the local government of Pinamungajan.
5. Ms. Bernadette Atil represented the Municipal Health Office of the local government of Pinamungajan.
6. Mr. Julius Erwin Aldas, Municipal Councilor, also attended as one of the representatives of the local government of Pinamungajan.
7. Attendees from Land Bank of the Philippines included the following:
 - a.) Mr. Jaime S. Cruz – AO, LBP Cebu LC; and
 - b.) Mr. Jose C. Diaz, Jr. and Mr. Amelito L. Segarra Jr. – Program Officers, EPMD;
8. Total attendance to the activity is twenty-six (26) pax, including employees and representatives for Excelsior Farms, Inc..

OPENING PROGRAM

9. Mr. Rebeboy Hervas of _____ who also acted as emcee for the event, opened the proceedings with a general introduction and prayer.
10. The Hon. Glenn Baricuatro, Municipal Mayor, was called on to deliver a short message for the attendees of the Stakeholders Consultation. He stated that Excelsior Farms, Inc. is investing a sizable amount of capital in putting up the piggery farm in Pinamungajan, which represents livelihood and employment opportunities for the municipality and its constituents. He reminded the audience that the forum is a way for knowing more about Excelsior Farms, Inc., and of understanding the opportunities as well as possible issues which may come with this new development in the municipality. In closing, Mayor Baricuatro thanked the farm owners and LBP for facilitating this activity that will give clear information about the biogas project and answer the issues and concerns of his constituents.

Note: Mayor Baricuatro left the event immediately after giving his opening message, before his attendance could be formally taken.

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

11. Mr. Jose Diaz, Jr. discussed topics on Climate Change and CDM; and Mr. Amelito Segarra Jr. presented Landbanks' CFSF.
12. 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.

The following are the highlights of his presentation:

- a.) Definition and Objectives of an EMP.
- b.) Impacts identified in the operation of a piggery farm:
 - Pig manure;
 - Foul odor;
 - Wastewater emission.
- c.) Prevention/Mitigation of Impacts: Pig Manure.
 - Implementation of 'Dry Cleaning System' in design and cleaning of pighouses at the farm;
 - Biogas digester facility as main system for handling pig manure (and wastewater) from pighouses;
 - Dried sludge from treatment of animal manure to be used as fertilizer for agronomic and horticultural crops.
- d.) Prevention/Mitigation of Impacts: Foul odor.
 - Biogas digester facility as main system for mitigation of foul odor generated wastewater from pighouses;
 - Biogas generated to be 'trapped' and directed to a combustion engine to be converted to electricity for use at farm operations.

e.) Prevention/Mitigation of Impacts: Wastewater.

- Biogas digester facility as main system for handling and treatment of wastewater from pighouses;
- Post-treatment ponds integrated in design of biogas digester facility, ensuring effective treatment of wastewater;
- Treated wastewater will be discharged back to the pighouses (for reuse);

OPEN FORUM/ISSUES AND CONCERNS

14. The participants were then given the chance to raise questions, issues, or concerns regarding the Biogas System project at Excelsior Farms, Inc. in Barangay Sacsac.

Questions, Issues, or Concerns Raised	Responses Provided
<p>Ms. Josephine Benoya, a resident of Barangay Sacsac, inquired if in the event of cooking food using methane gas for fuel, will there be any effect on the quality of the food being cooked (i.e. will the methane gas alter the composition of food being cooked, because methane gas is used?)?</p>	<p>Emmanuel Caintic, DVM, of Excelsior Farms, Inc. responded that cooking with methane gas as fuel source does not alter the quality of food being cooked. He explained that it is essentially similar to ordinary cooking, and use of methane has no altering 'chemical' effect on the composition of food being cooked.</p> <p>For the record, Mr. Caintic also clarified that methane gas generated from the biogas system to be constructed at the farm will not be used as fuel source for direct cooking processes. He said that the methane gas generated will be converted to electric energy as power source for farm operations.</p>
<p>Mr. Rebeboy Hervas of Excelsior Farms, Inc. directed this question at LBP Program Officers during the discussion: What will happen in the event that Excelsior Farms, Inc. does not get included into the CDM Program?</p>	<p>Mr. Amelito Segarra Jr., Program Officer of LBP, responded as thus: If, for whatever reason, Excelsior farms, Inc. does not get included into the CDM program, this will not affect the business relationship and/or ongoing transactions between the farm management and LBP, as long as Excelsior Farms, Inc. continues to comply with the requirements (environmental, legal, administrative, etc.) set by LBP related to whatever dealings or transactions between the two parties.</p>

15. 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 to be built and operated at Excelsior Farms, Inc.

16. The municipal officials and barangay community residents expressed their general agreement and support for the biogas project

CLOSING REMARKS

17. Mr. Rebeboy Hervas of Excelsior Farms, Inc. and emcee of the event, formally closed the proceedings by delivering some short closing remarks. He duly thanked participants of this activity, especially the community members of Barangay Sacsac, for taking the time and effort to attend and actively join in the discussions. The Stakeholders' Consultation activity was then formally ended at 5:00PM of the same day.

Prepared by:

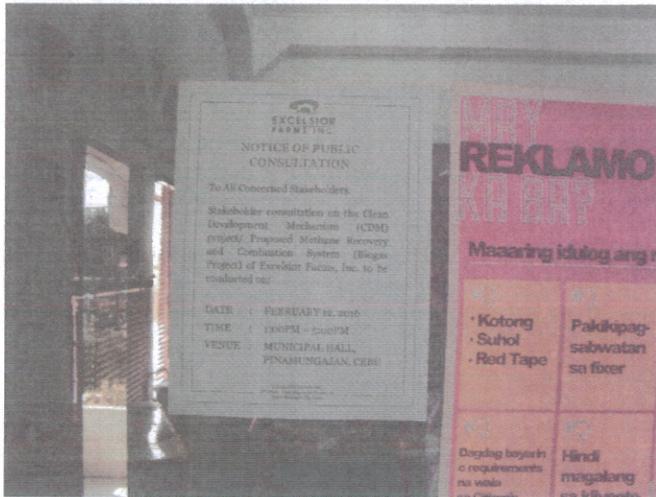

AMELITO L. SEGARRA JR.

Program Officer

Environmental Program and Management Department

Land Bank of the Philippines

Photos, NOTICE OF PUBLIC CONSULTATION



Appendix D. Site Evacuation Plan



CPA 21 Point Persons:

Farm Manager:
Pollution Control Officer:
Biodigester Supplier: Alterna Verde

Local Emergency Contact Details:

Pinamungahan Police Station: 032 468 9911
Pinamungahan Fire Marshal: 032 468 9072, 513 2698
Dr. Jose Ma. V. Borromeo Memorial District Hospital: 032 468 9264