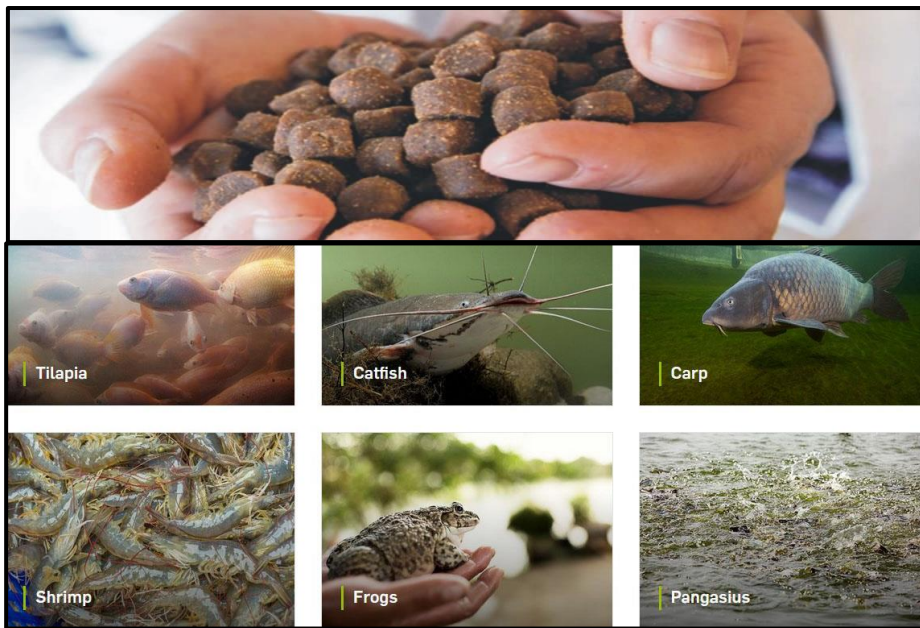


**De Heus Myanmar Ltd.**

# **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT (ESIA)**

**ON**

**AQUA FEED MILL FACTORY PROJECT,  
MYAUNG DAGAR INDUSTRIAL ZONE,  
HMAWBI TOWNSHIP, YANGON REGION**



**MARCH, 2022**

***Submitted by:***



**National Engineering & Planning Services Co., Ltd, Myanmar**

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## ABBREVIATIONS AND ACRONYMS

<i><b>Abbreviations</b></i>	
AP	Affected Person (s)
AOI	Area of Influence
BPC	Bio-Physical and Chemical
CC	Construction Contractor
CGMP	Current Good Manufacturing Principles
CO <sub>2</sub>	Carbon Dioxide
CSR	Corporate Social Responsibility
ECD	Environmental Conservation Department
EERT	External Emergency Response Team
EIA	Environmental Impact Assessment
EMO	Environmental Management Officer
EMP	Environmental Management Plan
ERA	Environmental Risk Assessment
ERT	Emergency Response Team
ERTL	Emergency Response Team Leader
ESIA	Environmental and Social Impact Assessment
ESO	Environmental Site Officer
FCR	Feed Conversion Ratio
GHG	Green House Gases
GRM	Grievance Redress Mechanism
GMP	Good Manufacturing Practice
HACCP	Hazard Analysis and Critical Control Point
HIA	Health Impact Assessment
HSE	Health, Safety and Environment
IFC	International Finance Corporation
NEPS	National Engineering & Planning Services Co., Ltd.
NEQEG	National Environmental Quality Emission Guidelines, 2015
OH & S Code	Occupational Health and Safety Code
PE	Polyethylene
pH	Measurement of Acidity and Alkalinity
PM <sub>1.0</sub>	Particulate Matter < 1 µ m
PM <sub>10</sub>	Particulate Matter < 10 µ m
PM <sub>2.5</sub>	Particulate Matter < 2.5 µ m

PMU	Project Management Unit
PPCU	Project Public Complaint Unit
SEC	Socio-Economic and Cultural
SIA	Social Impact Assessment
TVOC	Total Volatile Organic Compound
TLV	Threshold Limit Value

## **1. Executive Summary of (Environmental and Social Impact Assessment) on Aqua Feed Mill Factory Project**

### **Preamble**

The environmental and social impact assessment (ESIA) work is being conducted by NEPS Co., Ltd. of Myanmar. The study examines the environmental and social context of the proposed site and then identifies potential impacts on physical environment, socio-economic, cultural heritage and ecological issues based on the activities associated with Aqua Feed Mill Factory Project, which is being implemented by De Heus Myanmar Ltd., a member of the De Heus Nutrition founded in 1911, which has its base roots in the Netherlands. After more than 100 years the company is still owned and managed by the De Heus family and is a partner to the Agricultural Sector for over four generations, extending its professional expertise to various parts of the world, of which Myanmar is one of them. De Heus has grown into an international leading producer and exporter of complete ranges feeds, concentrates and premixes regarding animal nutrition, including feed for chicken, duck and quail, swine and others (dairy cattle and aqua)<sup>1</sup>

A Scoping Report on the ESIA of Aqua Feed Mill Project had been submitted earlier, and has been approved by the relevant environmental authority, ECD (Environment Conservation Department)<sup>2</sup>, after which the EIA works have been duly resumed to carry out the necessary tasks to complete the assignment according to ECD directives and professional guidance.<sup>3</sup>

### **Context of Project:**

**Presentation of Project Proponent: De Heus Myanmar Ltd.**

**Project Site:** Plot No. 309, 310, 311, Myaung Da Gar Industrial Zone, Hmawbi Township, Yangon Region.

**Project Aim:** The main objective is to improve a wide range of aqua feed products in their quality and effectiveness to fulfill the requirements of the Fishery Industry of Myanmar with international standardized fish feed. Furthermore, economic status of our Country will be increased. According to the Myanmar Companies Law 2017, the project proponent had established some animal feed projects during the past nine years in Myanmar and now an aqua feed mill factory is being constructed adjacent to its existing animal (livestock) feed mill factory premises at Myaung Dagar Industrial Zone, Hmawbi township of Yangon Region.

Although much of the raw materials are acquired from local markets, some of the raw materials such as soybean meal, corn, wheat and barley will be imported and the final end Aqua feed product will be distributed locally. The project also intends to export its end products for the future depending upon its commercial opportunities.

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<sup>1</sup> [www.deheus.com](http://www.deheus.com)

<sup>2</sup> Approval Letter No. (EIA-1/4-Ka 1504/2021) with directives from ECD., "Scoping Report of ESIA De Heus Aqua Feed Mill Factory Project" dated 9/9/2021

<sup>3</sup> Appendix F1: Commitment Letters of Project Proponent and Third Party Organization

**Presentation of Third Party Organization:** The project proponent, De Heus Myanmar Limited has assigned National Engineering & Planning Services (NEPS) to undertake the ESIA (Environmental and Social Impact Assessment) work on the Aqua Feed Mill Factory Project at Myaung Dagar Industrial Zone of Hmawbi Township, in Yangon Region.

NEPS is a company incorporated in Myanmar in 1998 initially specializing in Planning, Design, Construction and Engineering Consultancy Services related to civil engineering works. It has the resources and experience essential for the successful completion of the tasks. NEPS has more than 40 engineers and specialists of various disciplines including geology, geo- technology, agronomy, hydraulics, hydrology, environmental engineering, geometrics engineering, social economics and remote sensing subjects. Now NEPS Co., has two branches of works with relevant expertise professionals both for engineering works and environmental impact assessment works today.

Among the above specialists, 15 key personnel of NEPS have work-experience of more than 30 years and had proven expertise having post graduate trainings in overseas institutes. For flora, terrestrial fauna and aquatic fauna study, some specialists (Retired Professors and Lecturers from the renown Universities) are affiliated with NEPS to cope with the diversified nature of EIA works. Among other engineering works, NEPS has successfully carried out the environmental works such as a) Environmental and Social Impact Assessment (ESIA), b) Initial Environmental Examination (IEE) and c) Environmental Management Plans (EMP) and other related assignments over ground and under the sea located all around Myanmar during its years of environmental assessment service life.

More information about NEPS is available on the website: [www.neps-myanmarengineering.com](http://www.neps-myanmarengineering.com)

**Presentation of Health Expert for the Project and Health Impact Assessment:**

**U Kyaw Win:** Health Assessment Expert, NEPS has served as a Public Health Engineer since graduation in Civil Engineering and further studies at the Delft Institute of Technology in the Netherlands for Sanitary Engineering expertise for one year; acquiring relevant certificate of full attendance and accomplishment in his profession as a Public Health Engineer. Furthermore, he has various post- graduate Diplomas in Biotechnology and Management Administration from the Yangon Institute of Technology and the University of Rangoon respectively.

During Dec 2021, U Kyaw Win, accompanied by other Environmental Engineers of NEPS, carried out a Health Impact Assessment (HIA) of Aqua Feed Mill Factory Project at Myaung Dagar Industrial Zone, Hmawbi Township<sup>4</sup>.

**Summary of HIA, Assessment and Findings:** Our observatory findings and reference to the Environmental Quality Monitoring Report on De Heus Myanmar Ltd., by Hexagonal Angle International Consulting Co., Ltd<sup>5</sup>, (during Nov 2021), this report is made and interpreted as follows:

**Location:** 17°9'25.9"N and 95°58'7.89"E: Average air velocity (24 hrs) = 0.48 m/s

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<sup>4</sup> Appendix F: Health Impact Assessment on Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

<sup>5</sup> Appendix G: Environmental Quality Monitoring Report on De Heus Myanmar Ltd., Nov 2021

**Gaseous Emissions:** Toxic gaseous emission from process, depending on type of raw materials being used in the process. In this factory, there are some toxic gases  $\text{SO}_x$ ,  $\text{NO}_x$ ,  $\text{CO}_x$  particulates. Some gases are higher than TLV (Threshold Limit Value). They are  $\text{SO}_2 = 118.84 \mu\text{g}/\text{m}^3$  where  $\text{TLV} = 20 \mu\text{g}/\text{m}^3$  at 24 hr.  $\text{NO}_2 = 42.58 \mu\text{g}/\text{m}^3$  where  $\text{TLV} = 40 \mu\text{g}/\text{m}^3$  in one year. Even CO and  $\text{O}_3$  are detected. Physiological action of gases and vapours may affect human health, particularly the workers and nearby community.  $\text{CO}_2$  and  $\text{NO}_2$  would cause oxygen deficiency in air, lungs and blood.  $\text{SO}_2$  irritates lower trachea and bronchia.  $\text{O}_3$  also irritates bronchides and alveolar sacs. That is why air pollution contributes significantly as a cause of aggravating factor for medical conditions such as acute respiratory infections, chronic bronchitis, chronic obstructive pulmonary diseases, pulmonary emphysema, bronchial asthma and lung cancer (H. Meimann).

**Light and Ventilation:** Each floor of the factory has been installed with 70 ceiling electric bulbs and fluorescent lamps. Light is enough for working because lighting intensity specified is 5 watt /  $\text{ft}^2$  in workplace. According to direct observation, not much exhaust and exhaust fans are there. They rely on air conditioning system for ventilation. Besides, they want to control humidity by this system. Actually, almost 10 ft of fresh air / person / min is required.

**Heat and Humidity:** Air temperature (24 hr) is  $20.75^\circ\text{C}$  and relative humidity (24 hr) is 70.85% in the working area. They keep daily temperature and humidity records in the room.

Noise Pollution: Unwanted sound is defined as noise which is a pollution of the environment. It can affect the human beings and animals too. While visiting the factory, noise is not felt. Probably, it is a maintenance day and only a few forklift machines and operators are working by then. At the industrial area, sound level is standardized 70 dBA by NEQG but average dBA of the factory in 24 hr is 66.19 dBA.

Burn Accidents: It was seen that hot water supply pipes were being covered with heat insulating materials and fire extinguishers are already standby in position. This is a good practice example.

**Sanitation:** Toilet facilities are sufficient for the present workers though they are away from working area. For water supply, water quality testing results show not bad.

**Conclusion for HIA:** This type of factory is necessary for our country, which is based on agriculture and livestock husbandry economic one. Only when fish and livestock gain nutritious food, men eating this kind of fish and livestock will grow and develop as the strong and healthy nation; who may become effective productive force for our country. But in future, a well plan of GMP (Good Manufacturing Practice) for increased worker population is needed to prepare. At present, it was seen esthetically neat and tidy factory and odour is not felt, surprisingly. Solid wastes are collected by township municipality daily.

### **Policy, Legal and Institutional Framework**

Background information of legal aspects on environmental conservation in Myanmar relating to Aqua Feed Manufacturing is found in National Law for Environmental Conservation, enacted in 2012, Foreign Investment Law (2016) and also reference to international guidelines such as a) IFC:

“Environmental, Health and Safety Guidelines for Aqua culture”; b) CODEX Alimentarius (FAO/WHO): “Code of Practice for fish and fishery products”; c) ICUN, “Sustainability of Fish Feed in Aquaculture”; Code of Practice on good animal feeding (CAC/RCP 54-2004), etc.

The following existing major Myanmar Laws related to Aquafeed Manufacturing and Environment Conservation are outlined below:

- The Environmental Conservation Law, 2012;
- Myanmar Investment Law, 2016, The Pyidaungsu Hluttaw Law No. 40/2016;
- Myanmar Investment Rules, Notification No. 35/2017;
- The Import and Export Law, 2012;
- Myanmar YCDC Law, 2018;
- Factory Act, 1951;
- Industrial Use Explosive Substances Law (17/2018);
- Explosive Substance Act, 1908;
- Prevention from Danger of Harzardous Chemical and Associated Material Law (Pyidaungsu Hluttaw Law No. 28/2019);
- Myanmar Fire Force Law, 2015;
- Myanmar Insurance Law, 1993;
- Motor Vehicle Law, 2015;
- Public Health Law, 1972;
- The Protection and Prevvention of Communicable Disease Law, 1995;
- The Protection and Preservation of Ancient Monument Law, 2015;
- Conservation of Water Resource and River Law, 2006;
- Underground Water Act, 1930;
- The Land Acquisition Act, 1894;
- The Farmland Act, 2012;
- Employment and Skill Development Law, 2012;
- The Settlement of Labor Dispute Law, 2012;
- The Workmen Compensation Act, 1923, amended 2005;
- Labor Organization Law, 2011;
- Minimum Wages Law, 2013;
- Payment of Wages Law, 2016;
- Social Security Law, 2012;
- Leaves and Holidays Act, 1951;
- Environmental Conservation Rules Notification, 2014;
- National Environmental Quality (emission) Guidelines, 2015;
- EIA Procedure Notification, 2015 and
- Protection of Wild Animals, Wild Plants and Preservation of Natural Areas Laws, 1994.



The environment and social status shall not be endangered due to implementation of the project. To fulfill the environmental objectives of the project, De Heus' five principal ingredients of responsible feeding five areas of attention regarding responsible feeding<sup>6</sup> are as follows:

1. Allow healthy animals / fish to produce optimally;
2. Purchasing with a focus on sustainability;
3. Environment- friendly production and logistics;
4. Valuable contribution to society;
5. Committed employees to serve their utmost best for providing consistent quality products to their customers.

Detailed Policy, Legal Framework and Environmental Legislation of the project is further discussed in Chapter 3 of this Report.

### ***Project Description and Alternatives***

#### ***Project Size:***

Size of Project is Medium and it is defined upon the following factors;

Duration	50 Years
Planned Project staff	70 staff
Investment Capital	14.726 Million US Dollars
Leased Land Size / Rent	5.51 acres (22298 square meter @ 28. USD per sq. meter), Total rent of 624344. USD per annum (50 years grant for 5.51 acres of project site);
Lessor Name	U Aung Shwe Tun <sup>7</sup>

#### ***Project Components:***

***Table A: Aqua Feed Mill Infrastructure Components***

<b><u>Aqua Feed Mill (especially Fish Feed)</u></b>				
Sr. No.	Description	Sum. Floor Area (m <sup>2</sup> )	Storey	Building Ratio (%)
1	Intake Building	235	1	0.53
2	Production Tower (25.45mx20.70m)	4,741.34	9	1.19
3	Dosing Silo (20.70mx8.55m)	176.99	1	0.40
4	Corn Silo (3 x 2000 tons) Dia 13.5 m	429.20	3	0.97
5	Wheat Silo (6 x 360 tons) Dia 5.5 m	142.50	6	0.32
6	Raw Material Ware House (79.75mx35m)	2791.25	1	6.31
7	Finished Product Ware House (79.75mx38m)	3,030.50	1	6.85
8	Empty Bag Storage (20.7mx17.3m)	358.11	1	0.81

<sup>6</sup> <https://www.deheus.com/about-deheus/corporate-social-responsibility>

<sup>7</sup> Appendix C2: "Aqua Feed Mill Factory Land Acquisition Document Extract"

9	Liquid Tank + IBC Plant (14.5mx8m)	116.00	1	0.26
10	Transformer Room (10mx9.55m)	95.50	1	0.22
11	Ash Storage (14.55mx5m)	72.75	1	0.16
12	Steam Boiler	219.30	1	0.50
13	Workshop (20mx10m)	200.00	1	0.45
14	Toilet (3mx3m)	9.00	1	0.02
15	Bike Parking (2 nos. x 22mx4m)	176.00	1	0.40
16	Existing Road			
17	New Internal Road	8025.20		18.14
18	Greenery / Drainage / Others	27645.89		62.47
	Total %		100%	
	<b>Total Building Area</b>	15702.92 m <sup>2</sup>		
	<b>Total Building Land Measurement</b>	21997.1 m <sup>2</sup>		
	<b>Green Zone % of the whole land</b>	28.61%		

***Table B: Production Capacity***

1	<b>Total Production Capacity (1st Phase)</b>	6500	tons/month
2	<b>Total Production Capacity (End Phase)</b>	18000	tons/month

***Table C: Raw Material List of Aqua Feed Mill<sup>8</sup>***

No.	Raw Material List	No.	Raw Material List
1	AQUA MIN premix	26	MONOCAL.PHOSP 22.7
2	AQUA VIT Premix	27	Natuphos E 5000 L
3	Barley	28	PALMKERNEL EXPELLER
4	BLOODMEAL contact-dried	29	Peanut Cake
5	BROKEN RICE	30	PHYZYME XP 5000 L 0-250 sFU
6	Brown Rice	31	POULTRY MEAL
7	Calcium propionate 95%	32	Rapeseed Meal
8	CANOLA	33	RICE BRAN DEOILED
9	CHOLINE CHLORID 60 CN	34	RICEBRAN FF Dried
10	Corn A (Local)	35	SALT-NACL
11	CORNGLUTEN	36	SEA FISHOIL import
12	DDGS	37	SOYALECITHINE CRUDE
13	DDGS	38	Soybean meal
14	Dry Fish	39	Soybean Oil
15	Endox V Dry	40	Sunflower Meal
16	Fish Meal	41	THREONIN 98% powder
17	HYDROLYZED FEATHER MEAL	42	TRYPTOPHAAN 98%
18	LIME FINE	43	WHEAT 11CP

<sup>8</sup> Appendix C: MSDS (Material Safety Data Sheet) for imported micro raw materials

19	L-LYSINE-HCL 79%	44	WHEATBRAN MEAL coarse
20	Local Pure Corn DDGS	45	ZINC SULPHATE 350
21	Local Rice DDGS		
22	LYSINE SULPHATE 70%		
23	MEATBONEMEAL		
24	METHIONIN 90%		
25	METHIONIN 99%		

***Table D: Manufacturing End Product Plan of Aqua Feed Mill***

<b>Sr. No.</b>	<b>End Product Name</b>	<b>Bag size (kg)</b>
1	Power Fingerling Fish Feed	10Kg
2	Power Fingerling Fish Feed	25Kg
3	Power Fingerling Fish Feed	25Kg
4	Power Fingerling Fish Feed	25Kg
5	Fish Starter Feed	25Kg
6	Fish Grower Feed	25Kg
7	Fish Grower Feed	25Kg
8	Fish Finisher Feed 1	40Kg
9	Fish Finisher Feed 1	40Kg
10	Fish Finisher Feed 2	40Kg
11	Fish Finisher Feed 2	40Kg
12	Pangasius Fish Feed	50Kg
13	Fingerling for Snake-head fish	10Kg
14	Fingerling for Snake-head fish	25Kg
15	Fingerling for Snake-head fish	25Kg
16	Starter for Snake-head fish	25Kg
17	Grower for Snake-head fish	25Kg
18	Finisher for Snake-head fish	25Kg
19	Fingerling for Sea bass	25Kg
20	Fingerling for Sea bass	25Kg
21	Starter for Sea bass	25Kg
22	Starter for Sea bass	25Kg
23	Grower for Sea bass	25Kg
24	Grower for Sea bass	25Kg
25	Grower for Sea bass	25Kg
26	Grower for Sea bass	25Kg
27	Shrimp feed (Powder)	25Kg
28	Shrimp feed (Crumble)	25Kg
29	Shrimp feed (Pellet)	25Kg

Note: Finished Product Packing Bag Size is 35 kg

**Table E: Kinds of Fish focused to Feed with Aqua Feed Mill End Products**

KINDS OF FISH FOCUSSED TO FEED			
Sr. No.	Environment	English Name	Myanmar Name
1	Fresh water	Rohu	Nga Myit Chin
2	Fresh water	Catla	Nga Thine Gaung Phwa
3	Fresh water	Mrigal	Nga Gyin
4	Fresh water	Common carp	Shwe War Nga Gyin
5	Fresh water	Grass carp	Myetsar
6	Fresh water	Pangasius	Nga Tan
7	Fresh water	Tilapia	Tilapia
8	Fresh water	Stinging catfish	Nga Kyee
9	Fresh water	Walking catfish	Nga Khu
10	Fresh water	Climbing perch	Nga Pyei Ma
11	Fresh water	Butter catfish	Nga Nu Thann
12	Fresh water	Featherback	Nga Phel
13	Fresh water	Giant River Catfish	Nga Gyaung
14	Fresh water	Pacu	Nga Moke
15	Fresh water	Frog	Phar
16	Fresh water	Swamp eel	Nga Shint Ni
17	Fresh water	Eel	Nga Linn Pan
18	Fresh water	Giant Fresh Water Prawn	Yay Cho Pa Zun Htoke Gyee
Next Plan			
1	Sea water	Grouper	Kyauk Nga
2	Sea water	Snapper	Nga Parr Ne
3	Sea water	Pomfret	Nga Moke Phyu
4	Sea water	Giant Tiger Shimp ( Monodon )	Pa Zun Kyarr
5	Sea water	White legs shrimp ( Vannamei )	Pa Zun Phyu

**The project is now in its operational Phase.** However, the project Timeline for Pre-Construction, Construction and Operation stages are as follows as described in the Scoping Report earlier.

**Preconstruction stage:** requesting for permission from relevant government authorities.

**Construction stage:** The time frame for construction stage was one year (and is now 100% completed as of 2021): **At Primary stage** (first six months of construction stage): Laying of Foundations, construction of Production Tower, Dosing Silo was implemented. **At Secondary stage** (second six months of construction stage): Construction of Intake Building, Corn Silo (3x3200MT) dia 13.5 m, Wheat Silo (6x360 tons) Dia 5.5m, Raw Material Warehouse, Finished Product Warehouse, Empty bag Storage, Liquid Tank + IBC Plant, Transforer Room, Ash Storage, Steam Boiler, Toilets and internal Roads and other appurtenant structures were constructed.

**Operation stage:** Manufacturing, Importing, Storing and Distribution of Aqua Feed as described in project purpose.

**Project Implementation:**

Water from the Project's two tube wells is used as main water source. One tube well has already been drilled and the well water tested for its physical, chemical and micro-biological analysis. The water demand of project is 8m<sup>3</sup>/hr. As for power source, the Myaung Dagar Industrial Zone provides the necessary electrical energy. The project has also installed two transformers with capacity of 2 x 2500 KVA for implementation of the project.

For the solid waste from the project, the local municipality collects twice a day to dispose them to the nearest designated landfill site. As the Aqua feed production process is a dry mix process (with steam utilization), and process waste being re-milled and recycled, there is no significant solid or liquid waste expected from the manufacturing process, except waste from domestic use and sanitation of project staff. Rice husk pellets are being used as fuel for the boiler and the ash produced are used for agriculture.

Prevention of fire hazards are made by construction of emergency fire prevention pond and fire fighting hose installed in the premises. Relevant PPE (Personal Protection Equipment) for project staff are also equipped to all operational staff and factory workers<sup>9</sup>. Emergency Response Plan is being prepared by the project proponents and fire fighting team, supporting staff, first aid and rescue team personnel are planned to be mobilized<sup>10</sup>.

**Aqua Feed Processing:**

The proposed project intends to produce aqua feed products for fresh water fish mentioned above in Table E. For the future, the Aqua Feed Mill intends to produce aqua feed for sea water fish as well according to the need of the local fish culture sector.

The raw materials from the raw materials silo are sent to the raw intake structure to be batched and weighed for a specific aqua feed product and sent to the grinding machine, where it is then mixed with oil (fish oil, soybean oil, soya lecithin) and ground for producing the end product.

After grinding, the mixed feed is sent to the extrusion machine for its different end products (pellets with crumble separation) and then to the drying machine, after which they are enrobed (coated) and cooled; ready for sending them to the product silo to be weighed and packed to be stored in the warehouse before dispatch / delivery to the end users.

**Project Alternative:**

Mill design and mill processing changes are inevitable, and they are likely to develop very quickly. For this reason, the aquafeed miller of today must maintain flexibility within their mills and an awareness that changes are taking place to improve their products. Need for alternative of present

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<sup>9</sup> Appendix C1: PPE (Personal Protection Equipment) for Aqua Feed Mill Operators and Workers

<sup>10</sup> Figure 7: Master Plan of Fire Fighting System, Aqua Feed Mill

project design has to be identified after consultation meeting. However, there is ***no alternative project site at present***, except this existing location at Plot No. 309 - 311, which has been allowed to the company by the relevant government authorities.

***Project design alternative:*** Extrusion Reliability affects factory performance in the Aquafeed Production. Appropriate Extrusion Technology is vital for overall equipment effectiveness<sup>11</sup> and yield efficiency<sup>12</sup>, which are key factory performance indicators in the aquafeed processing. Sampling of the finished products are made for quality control of the Aquafeed produced and alternate adjustment to the Extrusion unit is duly made for optimum results.

***Alternative Project installation design:*** Initial project installation design had been two production lines. However, due to increase in end-user demand, the production line has been duly increased to four production lines as of Nov 2021.

***Project plans for acquiring certification:*** The project is planning for acquisition of international certificates such as ISO 22000: 2018, ISO 45001: 2018, and Global GAP CFM, etc.

The principles of the Hazard Analysis and Critical Control Point (HACCP) procedure may have application in the aquaculture feed milling if they are generally cost effective in terms of providing scientifically sound protection to animal and human health. Critical control points will have to be identified and in this regard FAO's Draft Code of Hygienic Practice for the Products of Aquaculture (FAO, 1996) provide a model for possible adaptation. Current Good Manufacturing Principles (CGMP) are represented in the balance of procedures and it is the use of CGMP employed worldwide which has proven successful in production of wholesome and effective feeds. As a result, adverse health impacts on humans or animals from compound feeds have been negligible.<sup>13</sup>

### ***Description of the Environment***

The Aqua Feed Mill project site occupies 5.51 acres of land at Plot No.309-311, adjacent to De Heus Animal Feed Mill of the Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region. The plant land is flat and low lying and is located about 700 ft away from the bank of the Hlaing River.

The specific study area has already been urbanized with human activities over the past many years.

Therefore, no mangroves nor sensitive or conservation worthy habitats in or surrounding environs of the project area are observed during the baseline study in May - June 2019 and update in Nov 2021 after the project's scoping report has been approved by the ECD. Baseline Data for:

- A. Biological Environment,
- B. Physical Environment,
- C. Socio Economic Status,
- D. Public Health and Education Status,
- E Social Welfare Environment, and

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<sup>11</sup> An indicator of runtime loss

<sup>12</sup> An indicator of material loss

<sup>13</sup> Stephen-Hassard Q.D. "Draft Technical Guidelines for Good Aquaculture Feed Manufacturing Practice" <http://om.ciheam.org/article.php?IDPDF=99600015>



F. Visual Components and Amenities of the Hmawbi Township, where the project site is located as described in the following pages of this Report.

**A. Biological Environment:** Myanmar is an agricultural land with many tropical forests and biodiversity. However, the specific study area of the project has already been urbanized with human activities over the past many years and is now an Industrial Zone area. Therefore, only a few trees and no mangroves species in the vicinity of the project area and along the Hlaing River are observed during the baseline study in May 2019 and updated in Nov 2021 after the scoping report for ESIA Aquafeed Mill Factory Project is being approved by the ECD. The project site is located at 0.13 miles (0.22 km) from the Hlaing River.

**B. Physical Environment:** The project area is located at Hmawbi Township of Yangon Region, at Longitude 95° 58' 6.4" E and Latitude 17° 9' 21.24" N; at 27 ft (8.2 m) above mean sea level; having subtropical climate; hot and humid weather with maximum temperature of 39.3°C and minimum temperature of 10.0°C<sup>14</sup>.

**C. Socio Economic Status:** The project area is in Hmawbi Township, which has a population of 202,904. This includes 70.4% for above 18 years and 29.6% under 18 years. The number of household is 46937 and on the assumption that one family comprises of 4.3 members in average. The ratio of male and female is 1:1.1 as of 2019.

Land utilization in Hmawbi Township is; net sown area 63272 acres, industrial land 4115 acres, urban 1193 acre and other land. Major crop productions are paddy (summer / monsoon), groundnut (winter), Black gram, Green gram (winter). Rubber is grown as a perennial crop. As a Livestock breeding, people in Hmawbi Township. Raise cow, goat, duck and chicken etc.

Myaung Dagar Industrial Zone is located in Hmawbi Township and there are factories, workshops and cottage industries in Hmawbi Township. There are 142834 numbers of persons who can work, 119473 numbers of workers, 23361 numbers of unemployed persons and unemployment rate is 19.55%. Most of the employed people are in Government Services, Industries, Factories, Aquaculture, Livestock Breeding, Trading, and Agricultural as their livelihood.

**D. Public Health and Education Status:** Regarding the Health Status of Hmawbi Township, there is three government hospitals, five clinics and thirty-five health care centers. The most common diseases are malaria, diarrhea, tuberculosis, dysentery and liver syrosis and rate of doctor and patient is 1:16908.

As of education status, there is one technical institute, fourteen high schools, six middle schools and 124 primary schools in Hmawbi Township. The main sources for water supply for agriculture and domestic use are from River Water Pumping and drilling tube wells. People in Hmawbi Township use Road transport, Railway transport and water transport as transportation.

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<sup>14</sup> Hmawbi Township Administration 2019 Report

**E. Social Welfare Environment:** There is one INGO, namely the World Vision, which serves the community with education and health care. There are also various NGOs such as Women's organization, Women and Children Organization, Myanmar Red Cross Society and Myanmar Fire Brigade in Hmawbi Township.

**F. Visual Components and Amenities:** There is one Football Playground, one Cinema and one Recreation Park at Hmawbi Township. There are two Pagodas, 456 Monasteries, 40 Churches, 7 Mosques and 2 Hindi temples in Hmawbi Township.

**Overall Project Site Social Environment:** There are two villages between the project site and the Hlaing River: a) Kangalay Village; b) Kone Galay village, which are about 2 miles away from the project site. According to the household social survey conducted during 2019. Although, the basic socio-economic status of these two villages are representative to the baseline data study of Hmawbi Township, in which they are being located, it is interesting to note that both Kangalay and Kone Galay villages do not have access to electricity as yet. The detailed survey report is attached in Appendix D of this report.

It is learned from the initial Public Consultation Meeting (Pre-PCM) held on 29 June 2019 that the respondent participants from these villages do not have any objection to the proposed project. The project intends to hold a Public Consultation Meeting by end Jan 2022 and arrangements are being prepared for this important Stakeholders Meeting.

#### **Potential Impacts, Risk Assessment, Hazard Management and Mitigation Measures**

Environmental and social impact assessment was carried out in a systematic manner, according to the construction and operational phases and seeking to identify any negative impacts that may be "significant" from an ecological, socio-economic or cultural perspective. The assessment is summarized below with positive impacts denoted by green shading.

**Table E: Summary Impact Assessment Matrix for Aqua Feed Mill Factory Project**

Construction Phase			Operational Phase		
Ref.	Impact/Issue	Significance	Ref.	Impact/Issue	Significance
<b>Bio-Physical &amp; Chemical</b>			<b>Bio-Physical &amp; Chemical</b>		
BPC/1	Changes in surface water quality	low	BPC/1	Changes in surface water quality	low
BPC/2	Changes in groundwater quality	low	BPC/2	Changes in groundwater quality	low
BPC/3	Changes to drainage patterns	low	BPC/3	Changes to drainage patterns	low
BPC/4	Changes in rates of erosion and siltation	low	BPC/4	Risk of Soil erosion and siltation	low
BPC/5	Changes to air quality	medium	BPC/5	Changes to air quality	medium
BPC/6	Changes to ambient noise levels	medium	BPC/6	Changes to ambient noise levels	medium
BPC/7	Changes to aquatic biota	low	BPC/7	Changes to aquatic biota	low
BPC/8	Changes to terrestrial biota	low	BPC/8	Changes to terrestrial biota	low

BPC/9	Changes to disease vector populations	low	BPC/9	Changes to disease vector populations	medium
BPC/10	Changes to land cover	medium	BPC/10	Changes to land cover	low
BPC/11	Changes in natural heritage site	low	BPC/11	Changes in natural heritage site	low
BPC/12	Changes to areas of natural habitat	low	BPC/12	Changes to areas of natural habitat	low
<b>Socio-Economic &amp; Cultural</b>			<b>Socio-Economic &amp; Cultural</b>		
SEC/1	Changes involving loss of private assets	low	SEC/1	Changes involving loss of private assets	low
SEC/2	Changes involving loss of cultural heritage	low	SEC/2	Changes involving loss of cultural heritage	low
SEC/3	Changes involving displacement of people	low	SEC/3	Changes involving displacement of people	low
SEC/4	Changes to local traffic patterns	medium	SEC/4	Changes to local traffic patterns	medium
SEC/5	Changes to fisheries	low	SEC/5	Changes to fisheries	low
SEC/6	Changes in local wage labour incomes/livelihood opportunities	medium	SEC/6	Changes in local wage labour incomes/livelihood opportunities	medium
SEC/7	Changes in local trade/commercial incomes/opportunities	low	SEC/7	Changes in local trade/commercial incomes/opportunities	medium
SEC/8	Changes in visual amenity	low	SEC/8	Changes in visual amenity	low
SEC/9	Changes to public infrastructure/community resources	low	SEC/9	Changes to public infrastructure/community resources	low

**Environmental Risk Assessment and Hazard Management:** As part of this EIA an environmental risk assessment (ERA) was carried out to determine the level of potential risk of significant pollution from the operational activities of the project (i.e. pollution levels that may risk or cause harm to humans or other biota). The risk assessment rating system is applied to the activities selected in order to determine a risk "value". Based on the primary risk component variables of frequency, probability, impacts, effect, containment, toxicity of release, sensitivity of event, the risk value is concluded as "low risk", assuming that the operations follow the HSE norms and exclude risk of natural disasters or extreme weather event.

**Potential Hazards identified in Aquafeed Production are:** (a) chemical contamination, (b) mycotoxins and (c) microbiological contamination. Potential defects are: decomposed feeds and fungal spoilage. Hazard management to avoid the potential defects is:

- Feed and fresh stocks should be purchased and rotated and used prior to the expiry of their shelf-life.
- Dry fish feeds should be stored in cool and dry areas to prevent spoilage, mould growth and contamination. Moist feed should be properly refrigerated according to manufacturer instructions.
- Feed ingredients should not contain unsafe levels of pesticides, chemical contaminants, microbial toxins, or other adulterating substances.

- Industrially produced complete feeds and industrially produced feed ingredients should be properly labelled. Their composition must fit the declaration on the label and they should be hygienically acceptable.
- Ingredients should meet acceptable, and if applicable, statutory standards for levels of pathogens, mycotoxins, herbicides, pesticides and other contaminants that may give rise to human health hazards.
- Only approved colors of the correct concentration should be included in the feed.

### ***Environmental Mitigation and Management Measures***

EMPs outline the mitigations, monitoring, and institutional measures to be taken during Project implementation and operation to avoid or control adverse environmental and social impacts and the actions needed to implement these measures.

For good manufacturing practice of the Aqua Feed production, a draft environmental code of practice and its plant maintenance have been discussed in Chapters 6.4 and 6.5 of this report respectively. In addition to incorporating these preventive measures to mitigate hazards and risks during the implementation of the project, priority measures that may be necessary in addition or as a focus of the EMP are listed below.

### ***Operational Phase Mitigation***

#### ***Bio Physical Chemical***

<b>Ref:</b>	<b>Impact Issue</b>	<b>Impact Significance</b>	<b>Mitigation Measures</b>	<b>Residual Impact</b>
BPC/1	Changes in surface water quality	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Prevent contaminated storm water running off the site.</li> <li>- No soiled materials, solid wastes, toxic or hazardous materials should be poured or thrown into water bodies for dilution or disposal</li> <li>- Collect and properly dispose of small maintenance materials such as oily rags, oil filters, used oil, etc.</li> <li>- Mobile equipment to service off site.</li> <li>- Establish sewerage facilities on site.</li> </ul>	Low
BPC/2	Changes in groundwater quality	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Ensure toxic compounds are not located at water accumulation points.</li> <li>- Chemically contaminated run-off to intercept and discharge where it will not leak to and contaminate groundwater.</li> </ul>	Low

BPC/5	Changes to air quality	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Ensure vehicle exhausts fully operational;</li> <li>- Utilize relevant pollution control machinery to capture any emitted fugitive dust, particulate matter, odor, gas or vapor from production process;</li> <li>- Avoid burning debris, vegetation or waste;</li> <li>- Avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals;</li> <li>- Minimize dust from exposed work sites / dirt roads by applying water on the ground regularly.</li> </ul>	Low
BPC/6	Changes to ambient noise levels	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Ensure vehicle exhausts fully-operational</li> <li>- Possible use of well-maintained machines and vehicles during night shift to prevent from noise impact upon the environment.</li> <li>- Minimize project transportation through community areas</li> <li>- Possible use of silencers in production machinery; and noise insulators during material delivery, generator or boiler functioning; ensuring noise level within the acceptable limit.</li> <li>- Use noise-control methods such as fences, barriers or deflectors (such as muffling devices for combustion engines or planting of fast-growing trees)</li> <li>- Maintain a buffer zone (such as open spaces, row of trees or vegetated areas) between the project site and residential areas to lessen the impact of noise to the living quarters.</li> </ul>	Low

BPC/9	Changes to disease vector populations	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Store all food and organic waste in sealed containers.</li> <li>- Ensure regular refuse collection and disposal.</li> <li>- Keep worksite clean and free of debris on daily basis</li> <li>- Avoid creating areas of standing water to discourage mosquito breeding.</li> <li>- Educate workforce on personal hygiene, occupational health and safety.</li> <li>- Provide personal protective gear for workers as necessary (safety gloves, dust masks, hard hats, boots, goggles, etc.)</li> <li>- Keep corrosive fluids and other toxic materials in properly sealed containers for collection and disposal in properly secured areas</li> <li>- Provide adequate sanitation facilities for workers on site.</li> </ul>	Low
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### ***Socio Economic, Cultural***

<b><i>Operational Phase Mitigation Measures for Socio Economic Impacts</i></b>				
<b>Ref:</b>	<b>Impact Issue</b>	<b>Impact Significance</b>	<b>Mitigation Measures</b>	<b>Residual Impact</b>
SEC/4	Changes to local traffic patterns	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Adherence to all speed limits for factory traffic.</li> <li>- Avoid road use at night and at peak times if possible.</li> <li>- Route conveyor traffic away from residential areas if possible.</li> </ul>	Low
SEC/5	Changes to fisheries (if any)	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Controlling polluted discharges to surface water</li> </ul>	Low
SEC/6	Changes in local wage labor incomes/ livelihood opportunities	Medium	<b>Benefit enhancement:</b> <ul style="list-style-type: none"> <li>- Consider priority hiring of local labor.</li> </ul>	
SEC/ 7	Changes in local trade/	Medium	<b>Benefit enhancement:</b> <ul style="list-style-type: none"> <li>- Consider priority sourcing of good and</li> </ul>	



	commercial incomes/ opportunities.		services from local suppliers	
SEC/8	Changes in visual amenity	Low	<b>EMP and focus on:</b> - Effective waste management plan - Suitable site fencing.	Low
SEC/9	Changes to public infrastructure/ community resources	Low	<b>EMP and focus on:</b> - Consider allowing community connections to utilities extended towards the project site.	Low

**Potential Cumulative Impact Assessment:** The key potential cumulative impacts assessed are:

- Impacts to water quality due to land-based runoff and water-based works during construction and operation of other Projects in the environs;
- Impacts from waste generation and disposal through the construction and operation of the Projects;
- Impact from vehicular, generator and boiler operation of the Project itself and other neighboring projects in the vicinity;
- Socio-economic impacts to possible displaced people who depend on the Project Sites for livelihood activities; and
- Impacts to air quality and public health from accidental spills and leaks, fugitive dust or particulate matter emitted from the project itself and / or other nearby projects.

There are only two neighboring projects surrounding the De Heus Aqua Feed Mill Compound: 1) The De Heus Animal (livestock) Feed Mill and 2) the Textile Factory and 3) some undeveloped and unused land nearby<sup>15</sup>, all of which the key potential cumulative adverse impacts mentioned above are being assessed as of **Low significance**, although oftentimes, the noise and air quality levels, may exceed the permissible allowable limit for a certain period of time. However, all these can be mitigated by adhering to good manufacturing practices and plant maintenance plans<sup>16</sup> for the project itself and also appropriate coordination with neighboring factories for the overall conservation of the environment.

### **Summary of Environmental and Social Management Plan**

The EMP organization or cell will be set up for the project proponent or the implementation of the EMP:

- **Environmental Auditor** to monitor the EMP Performance (can be internal or independent external);
- **Environmental Management Officer (EMO)**, who will manage the performance of the EMP,

<sup>15</sup> Figure 23: Neighboring projects in the environs of Aqua Feed Mill Factory Project

<sup>16</sup> Chapter 6.4 and 6.5 of this Report: "Draft Environmental Code of Practice for Aqua Feed Manufacturing and Preventive Maintenance for the Plant"

hired by the proponent (internal);<sup>17</sup>

- **Environmental Site Officer (ESO)**, who will assist EMO and carry out the environmental management on site;<sup>18</sup>

Environmental Management Plans for each identified impact<sup>19</sup>:

1. Water Quality Management and Ground Water Protection Plan;
2. Erosion, siltation and drainage Pattern Management Plan;
3. Air Quality Management Plan;
4. Waste Management Plan;
5. Traffic Management Plan;
6. Community Engagement and Development Plan;
7. Occupational Health and Safety Plan;
8. Emergency and Rescue Plan;
9. Corporate Social Responsibility (CSR) and Funding;
10. Restoration and Replantation Plan;
11. Environmental Monitoring Plan.

***The following contents of the above-mentioned sub plans of the EMP are incorporated in Chapter 8 of this Report:***

- Objective of each sub plan;
- Relevant Legal Requirements;
- Implementation Schedule of the sub plan;
- Management Action of the sub plan;
- Monitoring Plan of the sub plan;
- Indicator Parameters for each sub plan;
- Location of Sampling for testing work / analysis;
- Frequency of Monitoring work;
- Estimated Budget Allocation of each sub plan;
- Responsible Person / Organization for the sub plan Environmental Management.

Overall Annual Budget Estimate for implementation of the EMP and monitoring is 22 Million Kyats. However, if the project is beyond the current estimated cost, the necessary funds are deemed to be duly expanded by the project proponent.

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<sup>17</sup> Chapter 8.1.1 of this report: "EMO Roles and Responsibilities"

<sup>18</sup> Chapter 8.1.2 of this Report; "ESO Roles and Responsibilities"

<sup>19</sup> Chapter 8 of this Report: "Environmental Management, Monitoring and Budget Allocation"

## ***Public Consultation and Disclosure***

The public consultation and awareness program has involved a three tier process:

- i) Informal meetings held at Household and Ward level (socio economic surveys) in the proposed areas of works;
- ii) Ad hoc discussions with key Government agencies and NGOs as appropriate;
- iii) A formal Workshop / Consultation Meeting(s) for key stakeholders held to present the draft report findings. There is no human habitation inside or along the proposed project area. There is no issue of resettlement planning.

Pre Public consultation meeting was held on 29 June 2019 and the detailed meeting notes are described in Appendix - A, and the Public Consultation Meeting for ESIA was tentatively planned to be held by end Feb 2022. However, due to the raging pandemic, also in Myanmar, the PCM was not held in person or virtually via zoom meetings.

***Public Consultation Meeting for ESIA works:*** As mentioned above, although a stakeholders Meeting {Pre Public Consultation Meeting} was held during the scoping phase of the ESIA work, no other public meetings were held further (except for some KIIs {Key Informant Interviews} being conducted within this period).

The reason being, upon enquiring more of the availability of the necessary stakeholders' participation, it was learnt that many relevant stakeholders such as government staff and local inhabitants are not properly equipped with the required IT equipment or skills necessary to participate effectively via zoom. Furthermore, due to the ongoing surge of COVID-19 in Myanmar, and abiding to the standing instructions for prevention and control of the pandemic from the Nation's Ministry of Health and Sports, the Aqua Feed Mill Factory Project could not gather participants in person for the PCM in order to hold a meaningful Stakeholders' Meeting.

However, social surveys in households earlier, had revealed that there is no objection whatsoever, regarding the implementation of the Aqua Feed Mill Factory Project and the majority of respondents are desirous that this project is necessary for the nation and the health of all animals; including fish and aquatic biota, on which humans rely on, as their source of food and general well-being.

***Disclosure:*** As per the requirements of the EIA Procedure, De Heus Myanmar will disclose any relevant information when conducting a PCM (Public Consultation Meeting) on the Project in two newspapers (one in English and one in Myanmar). Project information will be available on the De Heus Myanmar website and signboards will be posted at the site office.

## ***Grievance Redress Mechanism***

A grievance redress mechanism (GRM) has been prepared for the Project with aim to create an enabling environment for affected communities and individuals to raise complaints to implementing entities in regard to the preparation and implementation of the project

**Proposed Mechanism:** The Project Management Unit (PMU) of the project proponent will establish a Project Public Complaint Unit (PPCU) which will act as a central recording and coordinating unit in compliance with the National Environmental Conservation Law, 2012 and ADB's SPS (2009) requirement to prevent and address community concerns and assist the project to maximize environmental and social benefits. The PMU will ensure that a Grievance Redress Mechanism (GRM) is publicized locally so that the community is fully aware of the mechanism and the local points of entry to it. The setting up of the GRM in the PMU and its initial implementation through the PMUs will be supported by the Environmental Management Officer (EMO) of the project.

#### **GRM Procedure and Timeframe<sup>20</sup>**

The procedure and timeframe for the grievance redress mechanism are described as follows (see Figures 26). The stages are represented by different colours in the flow diagram:

- (i) **Stage 1:** If a concern arises during construction or operation, the affected person will submit a written or oral complaint to the contractor directly. Whenever possible, the contractor will resolve the issue directly with the affected person. The contractor / operator will give a clear reply within one week. If successful, the contractor will inform the PPCU accordingly.
- (ii) **Stage 2:** If no appropriate solution can be found, the contractor /operator should forward the complaint to the PMU within five (5) working days. The complainant may also decide to submit a written or oral complaint to the PMU, either directly or via one of the GRM entry points. The PMU will investigate and identify the solution and provide a clear reply for the complainant within five (5) working days. The EMO of the project will assist the PMU in replying to the affected person. The PMU will timely convey the complaint/grievance and suggested solution to the contractors or operators of facilities. The contractors during construction and the operators during operation will implement the agreed upon redress solution and report the outcome to the PPCU within seven (7) working days.

**Note:** Since the project lies inside the Myaung Dagar Industrial Zone, and there are no local inhabitant(s) residing in the premises, a visible human settlement being observed only in the nearby villages of Kone Kalay and Kan Kalay villages, which are quite a distance (2-5 miles) of AOI (Area of Influence), it is deemed that if there is any complaint / grievance of the AP (Affected Persons) due to the project implementation, the above procedures can be applied with the Operator / Environmental Management Officer (EMO) of the project; being the focal person to address the matter instead of the contractor / Construction contractor (CC).

#### **Conclusions and Recommendations**

The environmental and social impact assessment concludes that:

1. There are no bio-physical impacts that are so highly negative that they would militate project development. However, Health Impact Assessment and Environmental Monitoring assess

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<sup>20</sup> Figure26: Grievance Redress Mechanism Procedure

that some gases emission in this factory are higher than TLV (Threshold Limit Value). They are  $\text{SO}_2 = 118.84 \mu\text{g}/\text{m}^3$  where  $\text{TLV} = 20 \mu\text{g}/\text{m}^3$  at 24 hr.  $\text{NO}_2 = 42.58 \mu\text{g}/\text{m}^3$  where  $\text{TLV} = 40 \mu\text{g}/\text{m}^3$  in one year. Even CO and  $\text{O}_3$  are detected. Physiological action of gases and vapours may affect human health, particularly the workers and nearby community.  $\text{CO}_2$  and  $\text{NO}_2$  would cause oxygen deficiency in air, lungs and blood.  $\text{SO}_2$  irritates lower trachema and brochina.  $\text{O}_3$  also irritates bronchides and alveolar sacs. That is why air pollution contributes significantly as a cause of aggravating factor for medical conditions such as acute respiratory infections, chronic bronchitis, chronic construction ventilation diseases, pulmonary emphysema, and bronchial asthma.

2. As potential emission of fugitive dust, particulate matter, release of steam, odorous VOCs from the aqua feed production processing are expected, it is recommended to consider GMP and as discussed in Chapters 6 – 8 of this Report, mitigation measures for adverse impacts by regular plant maintenance and repair, considering environmental code of practice for good aqua feed production and monitoring plans to utilize appropriate equipment for emission / effluent treatment to capture these exhaust emissions to maintain the ambient air quality and to curb the potential for release of very odorous substances to the atmosphere; especially where anaerobic processes are employed. Odor control strategies should take into account of varying wind directions to minimise disturbance to adjacent residential or human environment
3. The waste from the processing flow is being remilled (for re-processing in the mill); so that wet solid waste is not much expected except for the domestic liquid waste (effluent) from the cleansing activities of the plant and staff sanitation, which is suggested to be treated to prevent pollution and consequent damage of nearby watercourse by high BOD/COD effluent, toxic components such as biocides.
4. The importance of nitrogen: phosphorous ratio in the aqua feed production, interaction between food and water and the overall environmental responsibility of the feed producer to be adhered; according to relevant international standard for aqua feed manufacturing practices;
5. Some benefits will accrue in both the construction and the operational phases for local employment and commercial opportunities;
6. All infrastructures of the Aqua Feed Mill Factory: warehouses, silos, production towers and appurtenant structures should meet international standards for structural design integrity and operational performance to avoid catastrophic failures during normal operation and during exposure to natural hazards to prevent fires and explosions;
7. There are no potential resettlement issues as the project site is located in the Industrial Zone Area and there is no inhabitants present in the premises of the project site as observed during site visits (May-June 2019) and updated in Dec 2021. However, there are two villages outside the Myaung Dagar Industrial Zone area near the Hlaing River. Initiatives to protect

these indirectly affected human habitation from adverse impact from the project by ensuring project environs comply with NEQEG, 2015.

8. Safety concerns should be addressed by such measures as implementing strict health and safety procedures for staff, and the installation of adequate fencing and other site security to prevent trespass and vandalism. Effective process safety management should reduce accidents and minimize adverse effects of accidents on human health, environment and properties.

All the environmental and social impacts identified are capable of mitigation through a combination of adherence to National Environmental Conservation Law, 2012, Environmental Regulations, 2014, EIA Procedure Notification, 2015, Environmental Quality (Emission) Guidelines, 2015; and abiding to relevant local and international design codes and effective health and safety and environment (HSE) policy by the operators.

Regular inspection and audit will underpin the efficacy of the EMP. The environmental risk of the project has been evaluated as low assuming that the facilities are properly designed and operated according to international industry norms for the sector. Risks of fire hazard, severe weather or natural disaster affecting the project are present (cyclones, floods, fire, etc.). However, these are assumed to be mitigated through sound engineering design of the facilities, professional construction technologies, supervision and monitoring of the project during its construction and operational phases. Effective process safety management should reduce accidents and minimize adverse effects of accidents on human's health, environment and properties.

## EXECUTIVE SUMMARY IN MYANMAR LANGUAGE

### အကျဉ်းချုပ်အစီရင်ခံစာ

#### ၁.၁။ နိဒါန်း

သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ထိခိုက်မှုဆန်းစစ်ခြင်း (ESIA) လုပ်ငန်းကို NEPS Co., Ltd မှ ဆောင်ရွက်လျက်ရှိပါသည်။ လေ့လာမှုသည် De Heus Myanmar မှ အကောင်အထည်ဖော်ဆောင်ရွက် လျက်ရှိသည့် နှင့် ဆက်စပ်ဆောင်ရွက်လျက်ရှိသည့် လုပ်ဆောင်ချက်များအပေါ် Aqua Feed Mill Project အခြေခံ၍ ရုပ်ပိုင်းဆိုင်ရာ ပတ်ဝန်းကျင်၊ ယဉ်ကျေးမှုအမွေအနှစ်များနှင့် ဂေဟဗေဒဆိုင်ရာကိစ္စရပ်များ အပေါ် အလားအလာရှိသော သက်ရောက်မှုများကို အဆိုပြုထားသည့်နေရာ၏ ပတ်ဝန်းကျင်နှင့် လူမှုရေး ဆိုင်ရာ အခြေအနေများကို ဆန်းစစ်လေ့လာထားပါသည်။ De Heus Myanmar Limited သည် နယ်သာလန်တွင် အခြေပြုနေသော ၁၉၉၁ ခုနှစ်တွင် တည်ထောင်ခဲ့သည့် De Heus Nutrition ၏ အဖွဲ့ဝင်ဖြစ်ပါသည်။ နှစ်ပေါင်း ၁၀၀ ကျော်ကြာပြီးနောက် ကုမ္ပဏီကို De Heus မိသားစုမှ ပိုင်ဆိုင်ပြီး စီမံခန့်ခွဲနေဆဲဖြစ်ပြီး မျိုးဆက်လေးဆက်ကျော် စိုက်ပျိုးရေးကဏ္ဍအတွက် မိတ်ဖက်အဖြစ်ဆောင်ရွက်ကာ ကမ္ဘာ့နေရာအနှံ့အပြားတွင် ၎င်းတို့၏ ကျွမ်းကျင်မှုများကို တိုးချဲ့ဆောင်ရွက်လျက်ရှိပြီး ၎င်းတို့အနက်မှ မြန်မာနိုင်ငံသည်လည်း တစ်ခုအပါအဝင် ဖြစ်ပါသည်။ De Heus သည် ကြက်၊ ဘဲနှင့် ငှက်၊ ဝက်နှင့် အခြား တိရစ္ဆာန်အစာများ(နို့စားနွားများနှင့် ရေနေငါးအပါအဝင်)ကို တိရစ္ဆာန်အာဟာရနှင့်စပ်လျဉ်း၍ စုံလင်အစာ များနှင့် အချိုးကျကြိုတင်ရောစပ်ထားသော အစာများကို နိုင်ငံတကာထိပ်တန်းထုတ်လုပ်သူနှင့် ဖြန့်ချိ ရောင်းချသူဖြစ်လာခဲ့ပါသည်။

အဆိုပြုစီမံကိန်း၏ နယ်ပယ်တိုင်းတာခြင်းအစီရင်ခံစာ (Scoping Report) ကို အစောပိုင်းတွင် တင်ပြခဲ့ပြီး ဖြစ်ပြီး သက်ဆိုင်ရာအာဏာပိုင်ဖြစ်သည့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဌာနမှ အတည်ပြုခဲ့ပြီးနောက် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများဆန်းစစ်ခြင်းလုပ်ငန်းများကို ပြီးမြောက်ရန်အတွက် လိုအပ်သည့် လုပ်ငန်းများကို သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဌာန၏ ညွှန်ကြားချက်နှင့် ကျွမ်းကျင်လမ်းညွှန်မှုနှင့် အညီ ပြန်လည်လုပ်ဆောင်ရန် လိုအပ်ပါသည်။

#### ပရောဂျက်အကြောင်းအရာ

စီမံကိန်းအဆိုပြုတင်သွင်းသူ။ ။ De Heus Myanmar Ltd

စီမံကိန်းတည်နေရာ။ ။ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ မြေကွက် အမှတ် (၃၀၉၊ ၃၁၀၊ ၃၁၁)။

စီမံကိန်းရည်ရွယ်ချက်။ ။ အဓိကရည်ရွယ်ချက်မှာ မြန်မာ့ငါးလုပ်ငန်းနယ်ပယ်၏ လိုအပ်ချက်များကို နိုင်ငံ တကာအဆင့်မီငါးအစာဖြင့် ဖြည့်ဆည်းပေးနိုင်ရန် အရည်အသွေးနှင့် ထိရောက်မှုရှိသော ရေထွက်ကုန်များ ကျယ်ပြန့်လာစေရန်ဖြစ်ပါသည်။ ထို့ပြင်၊ ကျွန်တော်တို့မြန်မာနိုင်ငံ၏ စီးပွားရေးအဆင့်အတန်းလည်း တိုးတက် လာမည်ဖြစ်ပါသည်။ မြန်မာနိုင်ငံကုမ္ပဏီများ ဥပဒေ (၂၀၁၇)အရ မြန်မာနိုင်ငံတွင် လွန်ခဲ့သည့် (၉)နှစ်တာ ကာလအတွင်း တိရစ္ဆာန်အစာစီမံကိန်းအချို့ကို အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပြီး



ယခုအခါ မှော်ဘီမြို့နယ် မြောင်းတကာစက်မှုဇုန်ရှိ လက်ရှိတိရစ္ဆာန်အစာကြိတ်စက်ရုံနှင့်ကပ်လျက်တွင် တိရစ္ဆာန်အစာ ကြိတ်စက်ရုံကို တည်ဆောက်လျက်ရှိပါသည်။

ကုန်ကြမ်းအများစုကို ပြည်တွင်းဈေးကွက်မှ ရရှိသော်လည်း ပဲပုတ်ညက်ညက်၊ ပြောင်း၊ ဂျုံနှင့် မုယောစပါး ကဲ့သို့သော ကုန်ကြမ်းအချို့ကို တင်သွင်းမည်ဖြစ်ပြီး၊ နောက်ဆုံးထုတ်ကုန်ကို Aqua Feed ထုတ်ကုန်အဖြစ် ပြည်တွင်းတွင် ဖြန့်ဝေမည်ဖြစ်ပါသည်။ ပရောဂျက်သည် ၎င်း၏ စီးပွားဖြစ်အခွင့်အလမ်းများအပေါ်မူတည်၍ ၎င်း၏နောက်ဆုံးထုတ်ကုန်များကို တင်ပို့ရန်လည်း ရည်ရွယ်ထားပါသည်။

**တတိယအဖွဲ့အစည်း၏ တင်ပြချက်။** ။ စီမံကိန်းအဆိုပြုတင်သွင်းသူဖြစ်သည့် De Heus Myanmar Ltd မှ တတိယအဖွဲ့အစည်းဖြစ်သည့် National Engineering and Planning Services Co., Ltd (NEPS) မှ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်ရှိ ရေနေအစာကြိတ်စက်ရုံစီမံကိန်းတွင် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ထိခိုက်မှုဆန်းစစ်ခြင်း (ESIA)လုပ်ငန်းကို ဆောင်ရွက်ရန် တာဝန် ပေးအပ်ခဲ့ပါသည်။

NEPS Co., Ltd သည် မြို့ပြအင်ဂျင်နီယာလုပ်ငန်းများနှင့်သက်ဆိုင်သည့် စီမံကိန်း၊ ဒီဇိုင်း၊ ဆောက်လုပ်ရေး နှင့် အင်ဂျင်နီယာအတိုင်ပင်ခံဝန်ဆောင်မှုများ အထူးပြုဆောင်ရွက်ရန် ၁၉၉၈ခုနှစ်တွင် မြန်မာနိုင်ငံတွင် စတင်ဖွဲ့စည်းထားသော ကုမ္ပဏီတစ်ခုဖြစ်ပါသည်။ အလုပ်များကို အောင်မြင်စွာပြီးမြောက်ရန်အတွက် မရှိမဖြစ်လိုအပ်သော အရင်းအမြစ်များနှင့် အတွေ့အကြုံများရှိပါသည့်အပြင် ဘူမိဗေဒ၊ ပထဝီဝင်နည်းပညာ၊ စိုက်ပျိုးရေး၊ ဟိုက်ဒရောလစ်၊ ဇလဗေဒ၊ ပတ်ဝန်းကျင်အင်ဂျင်နီယာ၊ ဂျီဩမေတြီအင်ဂျင်နီယာ၊ လူမှုရေး ဘောဂဗေဒနှင့် အဝေးထိန်းအာရုံခံဘာသာရပ်များအပါအဝင် နယ်ပယ်အသီးသီးမှ အင်ဂျင်နီယာများနှင့် အထူးကျွမ်းကျင်သူများ (၄၀)ကျော်ရှိပါသည်။ လက်ရှိအချိန်တွင် ကုမ္ပဏီ၌ သက်ဆိုင်ရာကျွမ်းကျင် ပညာရှင်များနှင့်အတူ အင်ဂျင်နီယာလုပ်ငန်းများနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုအကဲဖြတ်ခြင်းလုပ်ငန်းများ အတွက် နယ်ပယ်နှစ်ခု ရှိပါသည်။

အထက်ပါ အထူးကျွမ်းကျင်သူများထဲတွင် ကုမ္ပဏီ၏ အဓိကကျသောဝန်ထမ်း(၁၅)ဦးသည် လုပ်ငန်း အတွေ့အကြုံနှစ်ပေါင်း(၃၀)ကျော်ရှိပြီဖြစ်ပြီး နိုင်ငံရပ်ခြားအဖွဲ့အစည်းများတွင် ဘွဲ့လွန်သင်တန်းများ ကျွမ်းကျင်တတ်မြောက်သူများဖြစ်ပါသည်။ သစ်ပင်ပန်းမန်များ၊ ကုန်းနေသတ္တဝါများနှင့် ရေနေသတ္တဝါများ လေ့လာခြင်းအတွက် အချို့သောကျွမ်းကျင်သူများ (အငြိမ်းစားပါမောက္ခများနှင့် တက္ကသိုလ်ကထိကများ) သည် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများလေ့လာဆန်းစစ်ခြင်းလုပ်ငန်းများ၏ ကွဲပြားသော သဘောသဘာဝကို နိုင်ငံခြား လုပ်ကိုင်နိုင်ရန်အတွက် ကုမ္ပဏီနှင့်ချိတ်ဆက်ထားပါသည်။ အခြားလုပ်ငန်း များထဲမှ NEPS ကုမ္ပဏီ သည် (က) ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာထိခိုက်မှုများ အကဲဖြတ်ခြင်း (ESIA)၊ (ခ) ကနဦးပတ်ဝန်းကျင် ဆိုင်ရာဆန်းစစ်လေ့လာခြင်း (IEE)၊ (ဂ) ပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှု အစီအစဉ် များ (EMP) နှင့် မြန်မာနိုင်ငံတစ်ဝှမ်းရှိ မြေပြင်နှင့် ပင်လယ်အောက်ရှိ အခြားသောဆက်စပ်တာဝန်များ ကဲ့သို့သော သဘာဝပတ်ဝန်းကျင်အကဲဖြတ်ခြင်းလုပ်ငန်း ဝန်ဆောင်မှုသက်တမ်းနှစ်များအတွင်း အောင်မြင် စွာ ဆောင်ရွက်နိုင်ခဲ့ပါသည်။

NEPS ကုမ္ပဏီ၏ နောက်ထပ်အချက်အလက်များကို [www.neps-myanmarengineering.com](http://www.neps-myanmarengineering.com) တွင် ကြည့်ရှုနိုင်ပါသည်။



**ပရောဂျက်အတွက် ကျန်းမာရေးကျွမ်းကျင်သူ၏ တင်ပြချက်နှင့် ကျန်းမာရေးထိခိုက်မှုများ အကဲဖြတ်ခြင်း**

ဦးကျော်ဝင်း - ကျန်းမာရေးအကဲဖြတ်ကျွမ်းကျင်သူ။ ။ NEPS ကုမ္ပဏီတွင် မြို့ပြအင်ဂျင်နီယာဘွဲ့ ရပြီးကတည်းက ပြည်သူ့ကျန်းမာရေးအင်ဂျင်နီယာအဖြစ် တာဝန်ထမ်းဆောင်ခဲ့ပြီး နယ်သာလန်နိုင်ငံရှိ Delft Institute of Technology တွင် သန့်ရှင်းရေးဆိုင်ရာကျွမ်းကျင်မှုဆိုင်ရာ အင်ဂျင်နီယာဘာသာရပ် များကို တစ်နှစ်တာသင်ကြားလေ့လာခဲ့ပါသည်။ ပြည်သူ့ကျန်းမာရေးအင်ဂျင်နီယာအဖြစ် သူ၏လုပ်ငန်းခွင် တွင် အပြည့်အဝတက်ရောက်ခြင်းနှင့် ပြီးမြောက်အောင်မြင်ခြင်းဆိုင်ရာ သက်ဆိုင်ရာလက်မှတ်များကို လည်း ရရှိခဲ့ပါသည်။ ထို့ပြင်၊ ရန်ကုန်နည်းပညာတက္ကသိုလ်နှင့် ရန်ကုန်တက္ကသိုလ်တို့မှ ဇီဝနည်းပညာနှင့် စီမံခန့်ခွဲမှု ဘွဲ့လွန်ဒီပလိုမာများလည်း ရရှိထားပါသည်။

၂၀၂၁ ခုနှစ်၊ ဒီဇင်ဘာလအတွင်း NEPS ကုမ္ပဏီ၏ အခြားသော ပတ်ဝန်းကျင်ဆိုင်ရာအင်ဂျင်နီယာများ နှင့်အတူ ဦးကျော်ဝင်းသည် Aqua Feed Mill Factory Project ၏ ကျန်းမာရေးဆိုင်ရာ ထိခိုက်မှုများ ဆန်းစစ်ခြင်း (HIA) ကို စီမံကိန်းတည်ရှိရာ မြောင်းတကာစက်မှုဇုန်တွင် ပြုလုပ်ခဲ့ပါသည်။

**ကျန်းမာရေးဆိုင်ရာ ထိခိုက်မှုများဆန်းစစ်ခြင်း၊ အကဲဖြတ်ခြင်းနှင့် တွေ့ရှိချက်များ အကျဉ်းချုပ်**

ဤအစီရင်ခံစာ၏ တွေ့ရှိချက်နှင့် လေ့လာဆန်းစစ်ချက်များကို ၂၀၂၁ခုနှစ်၊ နိုဝင်ဘာလအတွင်း Hexagonal Angle International Consulting Co., Ltd., မှ ပြုလုပ်ထားသော ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး စောင့်ကြည့်ခြင်းအစီရင်ခံစာအား ကိုးကားထားခြင်းဖြစ်ပြီး၊ အစီရင်ခံစာကို အောက်ပါအ တိုင်း ပြုစုထားပါသည်။

တည်နေရာ။ ။ မြောက်လတ္တီကျု ၁၇ ဒီဂရီ ၉ မိနစ် ၂၅.၉ စက္ကန့် နှင့် အရှေ့လောင်ဂျီကျု ၉၅ ဒီဂရီ ၅၈.၇ မိနစ် ၇.၈၉ စက္ကန့်ကြား၊ ပျမ်းမျှလေတိုက်နှုန်း (၂၄နာရီ) တစ်စက္ကန့် ၀.၄၈ မီတာနှုန်းဖြစ်ပါသည်။

**ဓာတ်ငွေ့ထုတ်လွှတ်မှု။** ။ လုပ်ငန်းစဉ်တွင် အဆိပ်သင့်ဓာတ်ငွေ့ထုတ်လွှတ်မှုသည် အသုံးပြုသည့် ကုန်ကြမ်း အမျိုးအစားပေါ်မူတည်ပါသည်။ ဤစက်ရုံတွင် SOX ၊ NOX နှင့် COX အမှုန်များပါဝင်သော အဆိပ်ဓာတ်ငွေ့များရှိပါသည်။ အချို့ဓာတ်ငွေ့များသည် Threshold Limit Value (TLV) ထက်မြင့်မားသည်။ ၂၄ နာရီအတွင်း သတ်မှတ်ထားသည့် TLV တန်ဖိုး ၂၀  $\mu\text{g}/\text{m}^3$  တွင် SO<sub>2</sub> ပါဝင်နှုန်းသည် ၁၁၈.၈၄  $\mu\text{g}/\text{m}^3$  ဖြစ်ပါသည်။ တစ်နှစ်အတွင်း သတ်မှတ်ထားသည့် TLV တန်ဖိုး ၄၀  $\mu\text{g}/\text{m}^3$  တွင် NO<sub>2</sub> ပါဝင်နှုန်းသည် ၄၂.၅၈  $\mu\text{g}/\text{m}^3$  ဖြစ်ပါသည်။ ထို့ပြင်၊ CO နှင့် O<sub>3</sub>ကိုလည်း ရှာဖွေတွေ့ရှိ ထားပါသည်။ ဓာတ်ငွေ့နှင့် အခိုးငွေ့များ၏ ဇီဝကမ္မလုပ်ဆောင်ချက်သည် လူ့ကျန်းမာရေး (အထူးသဖြင့် အလုပ်သမားများနှင့် အနီးနားရှိ အသိုင်းအဝိုင်း) ကို ထိခိုက်စေနိုင်ပါသည်။ CO<sub>2</sub> နှင့် NO<sub>2</sub> သည် လေ၊ အဆုတ်နှင့် သွေးများတွင် အောက်ဆီဂျင်ချို့တဲ့မှုကို ဖြစ်စေပါသည်။ SO<sub>2</sub> သည် လေဖြန့်အောက်ပိုင်းနှင့် brochina ကိုယားယံစေပြီး၊ O<sub>3</sub> သည် bronchides နှင့် alveolar sacs တို့ကို ယားယံစေပါ သည်။ထို့ကြောင့်၊ လေထုညစ်ညမ်းမှုသည် အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ပိုးဝင်ခြင်း၊ အဆုတ်လေရှူ လမ်းကြောင်းဆိုင်ရာ ရောဂါများ၊ ပန်းနာရင်ကျပ်နှင့် အဆုတ်ကင်ဆာကဲ့သို့သော ဆေးဘက်ဆိုင်ရာ အခြေအနေများကို ပိုမိုဆိုးရွားစေသည့် အကြောင်းအရင်းတစ်ခုအဖြစ် သိသိသာသာ ပံ့ပိုးပေးကြောင်း တွေ့ရပါသည်။သည်။

**အလင်းရောင်နှင့် လေဝင်လေထွက်။** ။ စက်ရုံ၏အထပ်တိုင်းတွင် မျက်နှာကျက်လျှပ်စစ်မီးသီး အလုံး

(၇၀)နှင့် မီးချောင်းများ တပ်ဆင်ထားပါသည်။ လုပ်ငန်းခွင်တွင် သတ်မှတ်ထားသော အလင်းရောင်ပြင်းအား ၅ ဝပ်/ ၂ ပေ ဖြစ်သောကြောင့် အလုပ်အတွက် လုံလောက်ပါသည်။ တိုက်ရိုက်ကြည့်ရှုလေ့လာချက်အရ အိတ်ဇောပန်ကာများ အများအပြားတပ်ဆင်ထားခြင်းမရှိကြောင်း တွေ့ရှိရပါသည်။ လေဝင်လေထွက် အတွက် တစ်မိနစ်အတွင်း လူတစ်ဦးအတွက် ၁၀ပေ ပတ်လည်အတွင်းရှိ လေကောင်းလေသန့်ကို လိုအပ်သော်လည်း လေအေးပေးစက်ကို အားထားသည့်အပြင် စိုထိုင်းဆကိုပါ ယခုစနစ်ဖြင့် ထိန်းချုပ်ရန် လုပ်ဆောင်ထားပါသည်။

**အပူနှင့် စိုထိုင်းဆ။** ။ လေအပူချိန် (၂၄နာရီ) သည် ၂၀.၇၅ ဒီဂရီစင်တီဂရိတ်ဖြစ်ပြီး အလုပ်ဧရိယာ တွင် နှိုင်းရစိုထိုင်းဆ (၂၄နာရီ) သည် ၇၀.၈၅ ရာခိုင်နှုန်းရှိပါသည်။ အလုပ်ခန်းထဲရှိ နေ့စဉ်အပူချိန်နှင့် စိုထိုင်းဆမှတ်တမ်းများကို သိမ်းဆည်းထားလေ့ရှိပါသည်။

**ဆူညံမှု။** ။ မလိုလားအပ်သောအသံကို ပတ်ဝန်းကျင်ညစ်ညမ်းမှုဖြစ်သည့် ဆူညံသံအဖြစ် သတ်မှတ် ထားပါသည်။ လူနှင့် တိရစ္ဆာန်များလည်း ထိခိုက်စေနိုင်ပါသည်။ စက်ရုံသို့ သွားရောက်လည်ပတ်နေချိန် တွင်မူ ပြုပြင်ထိန်းသိမ်းသည့်အချိန်နှင့် forklift စက်များနှင့် အော်ပရေတာ အနည်းငယ်သာ လည်ပတ် နေသည့်အတွက် ဆူညံသံများအား မခံစားရချေ။ စက်မှုဇုန်အတွင်း အမျိုးသားပတ်ဝန်းကျင်အရည်အသွေး (ထုတ်လွှတ်မှု)လမ်းညွှန်မှု၏ သတ်မှတ်တန်ဖိုးမှာ ၇၀ dBA ဖြစ်သော်လည်း ၂၄ နာရီအတွင်း စက်ရုံ၏ပျမ်းမျှ အသံဆူညံမှုသည် ၆၆.၁၉ dBA သာဖြစ်ကြောင်း တွေ့ရှိရပါသည်။

**မီးလောင်သည့်မတော်တဆမှုများ။** ။ ရေပေးဝေရေးပိုက်များကို အပူလျှပ်ကာပစ္စည်းများဖြင့် ဖုံးအုပ် ထားပြီး မီးသတ်ဆေးဘူးများသည် အသင့်အနေအထား ထားရှိပြီဖြစ်ကြောင်း တွေ့ရှိရပါသည်။

**သန့်ရှင်းကျန်းမာမှု။** ။ အလုပ်နှင့် ဝေးသော်လည်း လက်ရှိအလုပ်သမားများအတွက် အိမ်သာများ လုံလောက်ပါသည်။ ရေပေးဝေရေးအတွက် ရေအရည်အသွေးစမ်းသပ်မှုရလဒ်များမှာ ကောင်းမွန်ကြောင်း တွေ့ရှိရပါသည်။

**ကျန်းမာရေးဆိုင်ရာ ထိခိုက်မှုများဆန်းစစ်ခြင်း နိဂုံး။** ။ စိုက်ပျိုးရေးနှင့် မွေးမြူရေးလုပ်ငန်းကို အခြေခံသော ဤစက်ရုံမျိုးသည် ကျွန်တော်တို့နိုင်ငံအတွက် မရှိမဖြစ်လိုအပ်ပါသည်။ ငါးနှင့်တိရစ္ဆာန်များ အာဟာရပြည့်ဝ သောအစာကို ရရှိမှုသာလျှင် ငါးမျိုးနှင့် တိရစ္ဆာန်များကို စားသုံးသောလူများသည် သန့်မာပြီး ကျန်းမာသော နိုင်ငံအဖြစ် ဖွံ့ဖြိုးကြီးထွားလာမည်ဖြစ်ပါသည်။ နိုင်ငံအတွက် ထိထိရောက်ရောက် ဖြစ်ထွန်းလာနိုင်သည့် စွမ်းအားတွေ ဖြစ်လာနိုင်ပါသည်။ သို့သော်၊ အနာဂတ်တွင် လုပ်သားဦးရေတိုးတက်လာစေရန်အတွက် Good Manufacturing Practice (GMP) ၏ ကောင်းမွန်သော အစီအစဉ်ကို ပြင်ဆင်ရန်လိုအပ်ပါသည်။ လက်ရှိတွင် သပ်ရပ်သော စက်ရုံကိုတွေ့မြင်လပြီး အနံ့အသက်ကောင်းမွန်ကြောင်း တွေ့ရှိရပြီး အမှိုက်များကို မြို့နယ်စည်ပင်မှ နေ့စဉ်ကောက်ခံပါသည်။

### **မူဝါဒ၊ ဥပဒေရေးရာနှင့် အဖွဲ့အစည်းဆိုင်ရာမူဘောင်**

Aqua Feed ထုတ်လုပ်မှုနှင့်စပ်လျဉ်းသည့် မြန်မာနိုင်ငံရှိ သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ ဥပဒေရေးရာကဏ္ဍများ၏ နောက်ခံအချက်အလက်များကို ၂၀၁၂ခုနှစ်တွင် အတည်ပြုပြဋ္ဌာန်းခဲ့သော သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဆိုင်ရာ အမျိုးသားဥပဒေ၊ နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆) နှင့် နိုင်ငံတကာလမ်းညွှန်ချက်များ (က) IFC ၏ Aquaculture သဘာဝပတ်ဝန်းကျင်၊ ကျန်းမာရေးနှင့် ဘေးကင်းရေးလမ်းညွှန်ချက်များ၊ (ခ) CODEX Alimentarius (FAO/ WHO) ၏ ငါးနှင့် ရေထွက်ပစ္စည်း

ဆိုင်ရာ ကျင့်ထုံးဥပဒေ၊ (ဂ) ICUN ၏ ငါးမွေးမြူရေးအတွက် ငါးအစာရေရှည်တည်တံ့ရေး၊ (CAC/ RCP ၅၄-၂၀၀၄)၏ တိရစ္ဆာန်ကောင်းများ ကျွေးမွေးခြင်းဆိုင်ရာ ကျင့်ထုံးစသည်တို့ကို ကိုးကားထားပါသည်။

အောက်ဖော်ပြပါ လက်ရှိမြန်မာနိုင်ငံ၏ အဓိကကျသော ရေနေသတ္တဝါများထုတ်လုပ်ရေးနှင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဆိုင်ရာ ဥပဒေများကို အောက်တွင်ဖော်ပြထားပါသည်။

- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)
- မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ၊ ပြည်ထောင်စုလွှတ်တော်ဥပဒေအမှတ် ၄၀/၂၀၁၆
- မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ဥပဒေ (၂၀၁၇)၊ အမိန့်ကြော်ငြာစာအမှတ် ၃၅ /၂၀၁၇
- ပို့ကုန်သွင်းကုန် ဥပဒေ (၂၀၁၂)
- မြန်မာနိုင်ငံ YCDC ဥပဒေ (၂၀၁၈)
- စက်ရုံဥပဒေ (၁၉၅၁)
- စက်မှုလုပ်ငန်းသုံး ပေါက်ကွဲစေတတ်သော ပစ္စည်းများ ဥပဒေ (၁၇/၂၀၁၈)
- ပေါက်ကွဲစေတတ်သော ဥပဒေ (၁၉၀၈)
- အန္တရာယ်ရှိသော ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းအန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဥပဒေ (ပြည်ထောင်စု လွှတ်တော်ဥပဒေအမှတ် ၂၈/၂၀၁၉)
- မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့ ဥပဒေ (၂၀၁၅)
- မြန်မာ့အာမခံ ဥပဒေ (၁၉၉၃)
- မော်တော်ယာဉ် ဥပဒေ (၂၀၁၅)
- မြန်မာနိုင်ငံ ပြည်သူ့ကျန်းမာရေးဆိုင်ရာ ဥပဒေ (၁၉၇၂)
- ကူးစက်ရောဂါများ ကာကွယ်နှိမ်နင်းရေး ဥပဒေ (၁၉၉၅)
- ရှေးဟောင်းဝတ္ထုပစ္စည်းများ ကာကွယ်ထိန်းသိမ်းရေး ဥပဒေ (၂၀၁၅)
- ရေအရင်းအမြစ်နှင့်မြစ်ကြောင်းများ ထိန်းသိမ်းရေး ဥပဒေ (၂၀၀၆)
- မြေအောက်ရေအက် ဥပဒေ (၁၉၃၀)
- မြေသိမ်း ဥပဒေ (၁၈၉၄)
- လယ်ယာမြေ ဥပဒေ (၂၀၁၂)
- အလုပ်အကိုင်နှင့် ကျွမ်းကျင်မှုဖွံ့ဖြိုးတိုးတက်ရေး ဥပဒေ (၂၀၁၃)
- အလုပ်သမားရေးရာ အငြင်းပွားမှုဖြေရှင်းရေးနည်း ဥပဒေများ (၂၀၁၂)
- အလုပ်သမားလျော်ကြေးငွေအက် ဥပဒေ (၁၉၂၃)
- အလုပ်သမားအဖွဲ့အစည်း ဥပဒေ (၂၀၁၁)
- အခကြေးငွေပေးချေရေး ဥပဒေ (၂၀၁၆)
- လစာပေးချေမှု ဥပဒေ (၂၀၁၆)
- လူမှုဖူလုံရေး ဥပဒေ (၂၀၁၂)
- ခွင့်ရက်နှင့် အလုပ်ပိတ်ရက် အက် ဥပဒေ (၁၉၅၁)
- သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး စည်းမျဉ်းများ အသိပေးချက် (၂၀၁၄)
- အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅)
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အသိပေးချက် (၂၀၁၅)
- တောရိုင်းတိရစ္ဆာန်များ ကာကွယ်ရေး၊ တောရိုင်းအပင်များနှင့် သဘာဝနယ်မြေများ ထိန်းသိမ်းရေး ဥပဒေ (၁၉၉၄)

ပရောဂျက်ကို အကောင်အထည်ဖော်ခြင်းကြောင့် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုအဆင့်အတန်းများ မပျက်စီး စေရပါ။ ပရောဂျက်၏ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ရည်မှန်းချက်များကို ဖြည့်ဆည်းရန် De Heus ၏ တာဝန်သိကျွေးမွေးခြင်းဆိုင်ရာ အဓိကပါဝင်ပစ္စည်းများ (၅)မျိုးတွင် တာဝန်ရှိသော ကျွေးမွေးခြင်းနှင့် ပတ်သက်သည့် အာရုံစိုက်ရမည့်နယ်ပယ် (၅)ခုမှာ အောက်ပါအတိုင်းဖြစ်ပါသည်။

- (က) ကျန်းမာသော တိရစ္ဆာန်/ ငါးများကို အကောင်းဆုံး ထုတ်လုပ်ခွင့်ပြုခြင်း၊
- (ခ) ရေရည်တည်တံ့မှုကို အဓိကထား၍ ဝယ်ယူခြင်း၊
- (ဂ) သဘာဝပတ်ဝန်းကျင်နှင့် သဟဇာတဖြစ်သော ထုတ်လုပ်မှုနှင့် ထောက်ပံ့ပို့ဆောင်ခြင်း၊
- (ဃ) လူ့အဖွဲ့အစည်းအတွက် တန်ဖိုးရှိသော ပံ့ပိုးကူညီမှု၊
- (င) ဝန်ထမ်းများသည် ၎င်းတို့၏ဖောက်သည်များအား တသမတ်တည်းအရည်အသွေးပြည့်မီသော ထုတ်ကုန်များကို ပံ့ပိုးပေးရန်အတွက် အစွမ်းကုန်ဆောင်ရွက်ပေးရန် ကတိပြုပါသည်။

စီမံကိန်း၏ အသေးစိတ်မူဝါဒ၊ ဥပဒေမူဘောင်နှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ ဥပဒေများကို ဤအစီရင်ခံစာ၏ အခန်း(၃)တွင် ဆက်လက်ဆွေးနွေးထားပါသည်။

### စီမံကိန်းဖော်ပြချက်နှင့် အခြားရွေးချယ်စရာများ စီမံကိန်းအရွယ်အစား

စီမံကိန်း၏အရွယ်အစားသည် အလယ်အလတ်ဖြစ်ပြီး ၎င်းကို အောက်ပါအချက်များပေါ်တွင် သတ်မှတ်ထား ခြင်းဖြစ်ပါသည်။

အချိန်ကာလ	နှစ် ၅၀
ရည်မှန်းလုပ်သားဦးရေ	၇၀ ဦး
ရင်းနှီးမြှုပ်နှံမှု အရင်းအနှီး	အမေရိကန်ဒေါ်လာသန်းပေါင်း ၁၄.၇၂၆
မြေအကျယ်အဝန်း/ ဌာနရမ်းမှု	၅.၅၁ ဧက (၂၂၂၉ စတုရန်းမီတာ၊ တစ်စတုရန်းမီတာအတွက် အမေရိကန်ဒေါ်လာ ၂၈)၊ နှစ်စဉ်ဌာနရမ်းခရုစုပေါင်း အမေရိကန်ဒေါ်လာ ၆၂၄၃၄၄ (စီမံကိန်းမြေ ၅.၅၁ ဧကအတွက် နှစ် ၅၀စာ ဌာနရမ်းကြေး)
မြေဌာနရမ်းသူအမည်	ဦး အောင်ရွှေထွန်း

### စီမံကိန်းအစိတ်အပိုင်းများ

ဇယား (၁) Aqua Feed Mill အခြေခံအဆောက်အအုံ၏ အစိတ်အပိုင်းများ

Aqua Feed Mill (အထူးသဖြင့် ငါးစာ)				
Sr. No.	Description	Sum. Floor Area (m <sup>2</sup> )	Storey	Building Ratio (%)
1	Intake Building	235	1	0.53
2	Production Tower (25.45mx20.70m)	4,741.34	9	1.19

3	Dosing Silo (20.70mx8.55m)	176.99	1	0.40
4	Corn Silo (3 x 2000 tons) Dia 13.5 m	429.20	3	0.97
5	Wheat Silo (6 x 360 tons) Dia 5.5 m	142.50	6	0.32
6	Raw Material Ware House (79.75mx35m)	2791.25	1	6.31
7	Finished Product Ware House (79.75mx38m)	3,030.50	1	6.85
8	Empty Bag Storage (20.7mx17.3m)	358.11	1	0.81
9	Liquid Tank + IBC Plant (14.5mx8m)	116.00	1	0.26
10	Transformer Room (10mx9.55m)	95.50	1	0.22
11	Ash Storage (14.55mx5m)	72.75	1	0.16
12	Steam Boiler	219.30	1	0.50
13	Workshop (20mx10m)	200.00	1	0.45
14	Toilet (3mx3m)	9.00	1	0.02
15	Bike Parking (2 nos. x 22mx4m)	176.00	1	0.40
16	Existing Road			
17	New Internal Road	8025.20		18.14
18	Greenery / Drainage / Others	27645.89		62.47
	Total %			100%
	Total Building Area	15702.92 m <sup>2</sup>		
	Total Building Land Measurement	21997.1 m <sup>2</sup>		
	Green Zone % of the whole land	28.61%		

ဇယား (၂) ထုတ်လုပ်မှုစွမ်းရည်

1	Total Production Capacity (1st Phase)	6500	tons/month
2	Total Production Capacity (End Phase)	18000	tons/month

ဇယား (၃) ကုန်ကြမ်းပစ္စည်းစာရင်း To Print

No.	Raw Material List
1	AQUA MIN premix
2	AQUA VIT Premix
3	Barley
4	BLOODMEAL contact-dried
5	BROKEN RICE
6	Brown Rice
7	Calcium propionate 95%
8	CANOLA
9	CHOLINE CHLORID 60 CN
10	Corn A (Local)

11	CORNGLUTEN
12	DDGS
13	DDGS
14	Dry Fish
15	Endox V Dry
16	Fish Meal
17	HYDROLYZED FEATHER MEAL
18	LIME FINE
19	L-LYSINE-HCL 79%
20	Local Pure Corn DDGS
21	Local Rice DDGS
22	LYSINE SULPHATE 70%
23	MEATBONEMEAL
24	METHIONIN 90%
25	METHIONIN 99%
26	MONOCAL.PHOSP 22.7
27	Natuphos E 5000 L
28	PALMKERNEL EXPELLER
29	Peanut Cake
30	PHYZYME XP 5000 L 0-250 sFU
31	POULTRY MEAL
32	Rapeseed Meal
33	RICE BRAN DEOILED
34	RICEBRAN FF Dried
35	SALT-NACL
36	SEA FISH OIL import
37	SOYALECITHINE CRUDE
38	Soybean meal
39	Soybean Oil
40	Sunflower Meal
41	THREONIN 98% powder
42	TRYPTOPHAAN 98%
43	WHEAT 11CP
44	WHEATBRAN MEAL coarse
45	ZINC SULPHATE 350

ဇယား (၄) Aqua Feed Mill ၏ နောက်ဆုံးထုတ်ကုန် ထုတ်လုပ်မှုအစီအစဉ်

စဉ်	နောက်ဆုံးထုတ်ကုန်အမည်	အိတ်အရွယ်အစား (ကီလိုဂရမ်)
1	Power Fingerling Fish Feed	10Kg
2	Power Fingerling Fish Feed	25Kg
3	Power Fingerling Fish Feed	25Kg
4	Power Fingerling Fish Feed	25Kg
5	Fish Starter Feed	25Kg
6	Fish Grower Feed	25Kg
7	Fish Grower Feed	25Kg
8	Fish Finisher Feed 1	40Kg
9	Fish Finisher Feed 1	40Kg
10	Fish Finisher Feed 2	40Kg
11	Fish Finisher Feed 2	40Kg
12	Pangasius Fish Feed	50Kg
13	Fingerling for Snake-head fish	10Kg
14	Fingerling for Snake-head fish	25Kg
15	Fingerling for Snake-head fish	25Kg
16	Starter for Snake-head fish	25Kg
17	Grower for Snake-head fish	25Kg
18	Finisher for Snake-head fish	25Kg
19	Fingerling for Sea bass	25Kg
20	Fingerling for Sea bass	25Kg
21	Starter for Sea bass	25Kg
22	Starter for Sea bass	25Kg
23	Grower for Sea bass	25Kg
24	Grower for Sea bass	25Kg
25	Grower for Sea bass	25Kg
26	Grower for Sea bass	25Kg
27	Shrimp feed (Powder)	25Kg
28	Shrimp feed (Crumble)	25Kg
29	Shrimp feed (Pellet)	25Kg

မှတ်ချက်။ ။ နောက်ဆုံးထုတ်ကုန် အိတ်အရွယ်အစား (၃၅ ကီလိုဂရမ်)

ဇယား (၅) နောက်ဆုံးထုတ်ကုန်များအား အစာကျွေးရန် အဓိကထားသော ငါးအမျိုးအစားများ

အစာကျွေးရန် အဓိကထားသော ငါးအမျိုးအစားများ			
စဉ်	ပတ်ဝန်းကျင်	အင်္ဂလိပ်အမည်	မြန်မာအမည်
1	Fresh water	Rohu	Nga Myit Chin
2	Fresh water	Catla	Nga Thine Gaung Phwa



3	Fresh water	Mrigal	Nga Gyin
4	Fresh water	Common carp	Shwe War Nga Gyin
5	Fresh water	Grass carp	Myetsar
6	Fresh water	Pangasius	Nga Tan
7	Fresh water	Tilapia	Tilapia
8	Fresh water	Stinging catfish	Nga Kyee
9	Fresh water	Walking catfish	Nga Khu
10	Fresh water	Climbing perch	Nga Pyei Ma
11	Fresh water	Butter catfish	Nga Nu Thann
12	Fresh water	Featherback	Nga Phel
13	Fresh water	Giant River Catfish	Nga Gyaung
14	Fresh water	Pacu	Nga Moke
15	Fresh water	Frog	Phar
16	Fresh water	Swamp eel	Nga Shint Ni
17	Fresh water	Eel	Nga Linn Pan
18	Fresh water	Giant Fresh Water Prawn	Yay Cho Pa Zun Htoke Gyee
Next Plan			
1	Sea water	Grouper	Kyauk Nga
2	Sea water	Snapper	Nga Parr Ne
3	Sea water	Pomfret	Nga Moke Phyu
4	Sea water	Giant Tiger Shimp ( Monodon )	Pa Zun Kyarr
5	Sea water	White legs shrimp ( Vannamei )	Pa Zun Phyu

လက်ရှိအချိန်တွင် အဆိုပြုစီမံကိန်းသည် လုပ်ငန်းလည်ပတ်မှုအဆင့်တွင် ရှိနေပါသည်။ ။ သို့ရာတွင်၊ ဆောက်လုပ်ရေးအကြံအစဉ်၊ ဆောက်လုပ်ရေးနှင့် လုပ်ငန်းလည်ပတ်မှုအဆင့်များအတွက် စီမံကိန်းအချိန်ဇယားသည် အစောပိုင်း Scoping Report တွင် ဖော်ပြထားသည့်အတိုင်းဖြစ်ပါသည်။

**ဆောက်လုပ်ရေးအကြံအစဉ်။** ။ သက်ဆိုင်ရာအစိုးရအာဏာပိုင်များထံ ခွင့်ပြုချက် တောင်းခံနေဆဲ ဖြစ်ပါသည်။

**ဆောက်လုပ်ရေးအဆင့်။** ။ ဆောက်လုပ်ရေးအဆင့်သတ်မှတ်ချက်မှာ တစ်နှစ်ဖြစ်ပါသည်။ (ယခု ၂၀၂၁ခုနှစ် အထိ လုပ်ငန်းပြီးစီးမှု ၁၀၀ ရာခိုင်နှုန်းရှိပါသည်။) **မူလအဆင့်** (ပထမခြောက်လတာ တည်ဆောက်မှုအဆင့်)- အခြေခံအုတ်မြစ်ချခြင်း၊ ထုတ်လုပ်မှုမျှော်စင်ဆောက်လုပ်ခြင်း၊ Dosing silo များအား အကောင်အထည်ဖော် ဆောင်ရွက်ခဲ့ပါသည်။ **အလယ်တန်းစားအဆင့်** (ဒုတိယခြောက်လတာ တည်ဆောက်မှုအဆင့်)တွင် သွင်းယူသည့်အဆောက်အအုံ၊ အချင်း ၁၃.၅ မီတာရှိသော (၃ x၃၂၀၀ MT) ဆုံပြောင်းဆီလို၊ အချင်း ၅.၅ မီတာ ရှိသော (၆ x၃၆၀ တန်ဆုံ)လှုံဆီလို၊ ကုန်ကြမ်းပစ္စည်းသိုလှောင်ရုံ၊ ကုန်ချောသိုလှောင်ရုံ၊ အိတ်အလွတ် သိုလှောင်ရုံ၊ အရည်ကန် + IPC ကန်၊ ထရန်ဖော်မာထားခန်း၊ ပြာသိုလှောင်ခန်း၊ ရေနွေးငွေ့ဘိုင်လာအိုး၊ အိမ်သာနှင့် စက်ရုံအတွင်းလမ်းများနှင့် အခြားဆက်စပ် အဆောက်အအုံများကို ဆောက်လုပ်ခဲ့ပါသည်။ **လုပ်ငန်းလည်ပတ်မှုအဆင့်** - စီမံကိန်းရည်ရွယ်ချက်တွင်



ဖော်ပြထားသည့်အတိုင်း Aqua Feed ထုတ်လုပ်ခြင်း၊ တင်သွင်းခြင်း၊ သိုလှောင်ခြင်းနှင့် ဖြန့်ဖြူးခြင်းများ ပါဝင်ပါသည်။

### **စီမံကိန်းအကောင်အထည်ဖော်ခြင်း**

စီမံကိန်း၏ စက်ရေတွင်းနှစ်တွင်းမှ ရေကို ပင်မရေအရင်းအမြစ်အဖြစ် အသုံးပြုသည်။ ရေတွင်းတစ်တွင်းကို တူးဖော်ပြီးဖြစ်ပြီး ၎င်း၏ ရုပ်ပိုင်းဆိုင်ရာ၊ ဓာတုဗေဒနှင့် မိုက်ခရိုဇီဝဗေဒဆိုင်ရာ ခွဲခြမ်းစိတ်ဖြာမှုများအတွက် ရေတွင်းရေကို စမ်းသပ်ထားပြီးဖြစ်ပါသည်။ ပရောဂျက်၏ ရေလိုအပ်ချက်မှာ တစ်နာရီလျှင် ၈ ကုဗမီတာ ဖြစ်သည်။ လျှပ်စစ်ဓာတ်အားအရင်းအမြစ်အတွက် မြောင်းတကာစက်မှုဇုန်သည် လိုအပ်သော လျှပ်စစ် စွမ်းအင်ကို ထောက်ပံ့ပေးပါသည်။ စီမံကိန်းအကောင်အထည်ဖော်ရန်အတွက် ၂၅၀၀ ကီလိုဗို့အမ်ဖီယာ ရှိသော ထရန်စဖော်မာနှစ်လုံးကိုလည်း တပ်ဆင်ခဲ့သည်။

စီမံကိန်းမှ စွန့်ပစ်အမှိုက်များကို အနီးဆုံးသတ်မှတ်ထားသော အမှိုက်ပုံနားသို့ စွန့်ပစ်ရန်အတွက် စည်ပင် သာယာရေးအဖွဲ့မှ တစ်ရက်လျှင် နှစ်ကြိမ်ကောက်ခံပါသည်။ ရေနေအစာထုတ်လုပ်မှုလုပ်ငန်းစဉ်သည် အခြောက်ရောနှောခြင်းလုပ်ငန်းစဉ် (ရေခွေးငွေ့အသုံးပြုမှု)နှင့် စွန့်ပစ်ပစ္စည်းများကို ပြန်လည်ကြိတ်ခွဲပြီး ပြန်လည်အသုံးပြုခြင်းဖြစ်သောကြောင့်၊ စီမံကိန်း၏ အိမ်တွင်းအသုံးပြုမှုနှင့် သန့်ရှင်းရေးမှ စွန့်ပစ်ရည်များ မှလွဲ၍ ထုတ်လုပ်မှုလုပ်ငန်းစဉ်တွင် သိသာထင်ရှားသော အစိုင်အခဲ သို့မဟုတ် အရည်အညစ်အကြေးများ မတွေ့ရပါ။ စပါးခွံအလုံးများကို ဘွိုင်လာအတွက် လောင်စာအဖြစ် အသုံးပြုကြပြီး ထွက်ရှိသောပြာများကို စိုက်ပျိုးရေးအတွက် အသုံးပြုသည်။

မီးဘေးအန္တရာယ်ကြိုတင်ကာကွယ်ရေးကို အဆောက်အဦအတွင်း အရေးပေါ်မီးငြိမ်းသတ်ရေပိုက်များ တပ်ဆင်တည်ဆောက်ခြင်းဖြင့် မီးဘေးအန္တရာယ်ကြိုတင်ကာကွယ်ရေးကို ဆောင်ရွက်လျက်ရှိသည်။ ပရောဂျက် ဝန်ထမ်းများအတွက် သက်ဆိုင်ရာ PPE (ကိုယ်ရေးကိုယ်တာကာကွယ်ရေးပစ္စည်း)ကိုလည်း ဝန်ထမ်းနှင့် စက်ရုံအလုပ်သမားများအတွက် တပ်ဆင်ထားပါသည်။

အရေးပေါ်တုံ့ပြန်ရေးအစီအစဉ်ကို စီမံကိန်းအဆိုပြုတင်သွင်းသူများနှင့် မီးသတ်တပ်ဖွဲ့နှင့် ကယ်ဆယ်ရေး ဝန်ထမ်းများက တာဝန်ယူစည်းရုံးရန် စီစဉ်ထားသည်။

### **ရေနေအစာထုတ်လုပ်ခြင်း**

အဆိုပြုထားသော စီမံကိန်းသည် အထက်ဖော်ပြပါ ဇယား (၅) တွင် ဖော်ပြထားသော ရေချိုငါးများအတွက် ရေထွက်ပစ္စည်းထုတ်လုပ်ရန်ရည်ရွယ်ပြီး အနာဂတ်တွင် ရေနေအစာကြိတ်စက်ရုံသည် ဒေသတွင်းရှိ ငါးမွေးမြူရေးကဏ္ဍ၏ လိုအပ်ချက်အရ ပင်လယ်ငါးများအတွက်ပါ ရေထွက်ပစ္စည်းများ ထုတ်လုပ်ရန် ရည်ရွယ်ထားပါသည်။

ဆီလိုကုန်ကြမ်းများမှကုန်ကြမ်းများကို ကုန်ကြမ်းထည့်သည့်စက်ထဲသို့ ရေနေအစာထုတ်လုပ်ရန် သတ်မှတ်ထားသည့်အလေးချိန်အတိုင်းရရှိရန် ချိန်ပြီးနောက် ကြိတ်ခွဲစက်သို့ ပေးပို့ကာ အဓိကထုတ်ကုန်နှစ်ခု ဖြစ်သော (က) Crumble Mix နှင့် (ခ) အလုံးများ ရရှိအောင် ဆီ (ငါးဆီ/ပဲစိမ်းဆီ)နှင့် ရောစပ်ပြီး ကြိတ်ခွဲရပါသည်။

ကြိတ်ခွဲပြီးနောက်၊ ရောစပ်ထားသောအစာများအား မတူညီသောထုတ်ကုန်များအတွက် ထုခွဲထုတ်စက်သို့ ပေးပို့ပြီး အခြောက်ခံစက်ထဲ ပေးပို့ကာ အအေးခံပြီးနောက် ကုန်ပစ္စည်းများကို ချိန်တွယ်ထုတ်ပိုးပြီး သုံးစွဲသူများထံ မပေးပို့မီ သိုလှောင်ခန်းတွင် သိမ်းဆည်းထားပါသည်။

### **အခြားလုပ်ဆောင်ချက်များ**

ကြိတ်ခွဲစက်ဒီဇိုင်းနှင့် ကြိတ်ခွဲခြင်းဆိုင်ရာပြောင်းလဲမှုများသည် မလွဲမရှောင်သာဖြစ်ပြီး ၎င်းတို့သည် အလွန်လျင်မြန်စွာ ဖွံ့ဖြိုးလာဖွယ်ရှိပါသည်။ ထို့ကြောင့် ယနေ့ခေတ်ရေနေအစာထုတ်လုပ်သည့်ကြိတ်စက်များသည် လုပ်ငန်းတွင် လိုက်လျောညီထွေမှုကို ထိန်းသိမ်းထားရမည်ဖြစ်ပြီး ၎င်းတို့၏ ထုတ်ကုန်များတိုးတက်စေရန် အပြောင်းအလဲများဖြစ်ပေါ်နေကြောင်းကိုလည်း သတိပြုရမည်ဖြစ်ပါသည်။ လက်ရှိအချိန်တွင်မူ သက်ဆိုင်ရာ အာဏာပိုင်များမှ ခွင့်ပြုထားသည့် မြေကွက်အမှတ် ၃၀၉-၃၁၁ မှလွဲ၍ အခြားရွေးချယ်စရာ နှင့် လုပ်ဆောင်ချက်များ မရှိသေးပေ။

**အခြားစီမံကိန်းဒီဇိုင်း။** ■ Extrusion Reliability သည် ရေနေအစာထုတ်လုပ်မှုတွင် စက်ရုံ၏ စွမ်းဆောင်ရည်အပေါ် သက်ရောက်မှု ရှိပါသည်။ သင့်လျော်သော Extrusion နည်းပညာသည် ရေနေအစာထုတ်လုပ်ခြင်းလုပ်ငန်းတွင် အဓိကကျသောညွှန်းကိန်းများဖြစ်သည့် စက်ကိရိယာအားလုံးထိရောက်စွာ စွမ်းဆောင်နိုင်မှုနှင့် အထွက်နှုန်း အတွက် အရေးကြီးပါသည်။ အချောထုတ်ကုန်များ၏ နမူနာကို ထုတ်လုပ်ထားသောရေနေအစာ၏ အရည်အသွေးထိန်းချုပ်ရန်နှင့် အကောင်းဆုံးရလဒ်များရရှိရန်အတွက် Extrusion ယူနစ်ကို လိုအပ်သည့်အခြားချိန်ညှိမှုများ ပြုလုပ်နိုင်ရန်အတွက် ထုတ်လုပ်ထားခြင်းဖြစ်ပါသည်။

**အခြားစီမံကိန်းတပ်ဆင်ခြင်းဒီဇိုင်း။** ■ ကနဦးစီမံကိန်းတပ်ဆင်ခြင်းဒီဇိုင်းမှာ ထုတ်လုပ်မှုလိုင်းနှစ်ခုရှိခဲ့သည်။ သို့သော်လည်း၊ သုံးစွဲသူများ၏ ဝယ်လိုအားတိုးလာခြင်းကြောင့် ထုတ်လုပ်မှုလိုင်းအား ၂၀၂၁ ခုနှစ်၊ နိုဝင်ဘာလတွင် ထုတ်လုပ်မှုလိုင်း လေးခုအထိ တိုးမြှင့်ခဲ့သည်။

**အသိအမှတ်ပြုလက်မှတ်များ ရယူရန် စီမံကိန်း၏အစီအစဉ်များ။** ■ အဆိုပါပရောဂျက်သည် ISO 22000: 2018၊ ISO 45001:2018 နှင့် Global GAP CFM ကဲ့သို့သော နိုင်ငံတကာအသိအမှတ်ပြုလက်မှတ်များရယူရန် စီစဉ်နေပါသည်။

တိရိစ္ဆာန်နှင့် လူသားတို့၏ ကျန်းမာရေးကို သိပ္ပံနည်းကျကောင်းမွန်သော အကာအကွယ်များ ပေးဆောင်မှုတွင် ယေဘုယျအားဖြင့် ကုန်ကျစရိတ်သက်သာပါက သဘာဝဘေးဆိုင်ရာခွဲခြမ်းစိတ်ဖြာခြင်းနှင့် အရေးပါသော ထိန်းချုပ်မှုအမှတ် (HACCP) လုပ်ထုံးလုပ်နည်း၏ အခြေခံမူများသည် ရေနေအစာကြိတ်ခြင်းလုပ်ငန်းတွင် အသုံးပြုနိုင်မည်ဖြစ်သည်။ အရေးပါသော ထိန်းချုပ်မှုအချက်များကို ခွဲခြမ်းစိတ်ဖြာပြီး FAO ၏ ငါးမွေးမြူရေးထုတ်ကုန်များအတွက် သန့်ရှင်းရေးကျင့်ထုံးမူကြမ်း (FAO, 1996)နှင့်အညီ ဖြစ်နိုင်ချေရှိသော လိုက်လျောညီထွေဖြစ်စေသည့် စံနမူနာဖြစ်ရပါမည်။ လက်ရှိကောင်းမွန်သောထုတ်လုပ်မှုအခြေခံမူများ (CGMP)သည် ထုတ်လုပ်မှုတွင် ဟန်ချက်ညီညီလုပ်ဆောင်နိုင်ကြောင်းနှင့် ကမ္ဘာ့တစ်ဝန်း CGMP ကို အသုံးပြုခြင်းကြောင့် အကျိုးရှိပြီး အစာထုတ်လုပ်ရာတွင် ထိရောက်အောင်မြင်ကြောင်း သက်သေပြခဲ့

ပါသည်။ ရလဒ်အနေဖြင့်၊ ဒြပ်ပေါင်းအစာများကြောင့် လူနှင့် တိရစ္ဆာန်များအပေါ် ဆိုးရွားသော ကျန်းမာရေး ဆိုင်ရာသက်ရောက်မှုများမှာ လျစ်လျူရှုနိုင်လောက်သည်အထိ နည်းပါးပါသည်။

**ပတ်ဝန်းကျင်အနေအထား**

ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြေကွက်အမှတ် (၃၀၉-၃၁၁)တွင် တည်ရှိသော ရေနံအစာကြိတ် စက်ရုံသည် မြေဧက (၅.၅၁) ကျယ်ဝန်းပြီး၊ မှော်ဘီမြို့နယ် မြောင်းတကာစက်မှုဇုန်၏ De Heus တိရစ္ဆာန် အစာစက်ရုံနှင့် ကပ်လျက် တည်ဆောက်ထားပါသည်။ မြေမျက်နှာသွင်ပြင်သည် ညီညာပြန့်ပြူး၍ မြေနိမ့် ပိုင်းဖြစ်ပြီး လှိုင်မြစ်ကမ်းနံဘေး ပေ ၇၀၀ ခန့်အကွာတွင် တည်ရှိပါသည်။

လေ့လာမှုဧရိယာသည် လွန်ခဲ့သည့်နှစ်များစွာအတွင်း လူများ၏လုပ်ဆောင်မှုကြောင့် မြို့ပြအဖြစ် သတ်မှတ် ထားပြီးဖြစ်သည်။ ထို့ကြောင့်၊ စီမံကိန်းဧရိယာ၏ သို့မဟုတ် အနီးတဝိုက်ပတ်ဝန်းကျင်တွင် ဒီရေတောများ၊ ထိလွယ်ရှလွယ် သို့မဟုတ် ထိန်းသိမ်းထိုက်သောနေရာများ မရှိကြောင်း ၂၀၁၉ ခုနှစ်၊ မေလမှ ဇွန်လ အတွင်း ကွင်းဆင်းလေ့လာမှုပြုလုပ်ခဲ့ပြီး၊ သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဌာနမှ စီမံကိန်း၏ နယ်ပယ် တိုင်းတာသတ်မှတ်ခြင်းအစီရင်ခံစာကို အတည်ပြုပြီးနောက် ၂၀၂၁ခုနှစ်၊ နိုဝင်ဘာလတွင် ထပ်မံကွင်းဆင်း လေ့လာမှု ပြုလုပ်ခဲ့ပါသည်။ အခြေခံအချက်အလက်များမှာ -

- (က) ဇီဝပတ်ဝန်းကျင်၊
- (ခ) ရုပ်ပတ်ဝန်းကျင်၊
- (ဂ) လူမှုစီးပွားအဆင့်အတန်း၊
- (ဃ) ပြည်သူ့ကျန်းမာရေးနှင့် ပညာရေးအဆင့်အတန်း၊
- (င) လူမှုဝန်ထမ်းပတ်ဝန်းကျင် နှင့်
- (စ) အဆိုပြုစီမံကိန်းတည်ရှိရာ မှော်ဘီမြို့နယ်၏ မျက်စိပသာဒနရှိမှုနှင့် သာယာအဆင်ပြေမှုများ။

**(က) ဇီဝပတ်ဝန်းကျင်။** ။ မြန်မာနိုင်ငံသည် အပူပိုင်းသစ်တောများနှင့် ဇီဝမျိုးစုံမျိုးကွဲပေါများသော စိုက်ပျိုးမြေဖြစ်ပါသည်။ သို့သော်လည်း စီမံကိန်းဧရိယာသည် လွန်ခဲ့သောနှစ်များစွာအတွင်း လူများ၏ လုပ်ဆောင်မှုများဖြင့် ပြောင်းလဲခဲ့ပြီး ယခုအခါ စက်မှုဇုန်နယ်မြေတစ်ခုဖြစ်လာခဲ့ပါသည်။ ထို့ကြောင့် ESIA Aquafeed Mill Factory Project အတွက် နယ်ပယ်တိုင်းတာသတ်မှတ်ခြင်းအစီရင်ခံစာကို အတည်ပြု ပြီးနောက် ESIA Aquafeed Mill Factory Project ကို အတည်ပြုပြီးနောက် ၂၀၁၉ ခုနှစ် မေလတွင် စီမံကိန်းဧရိယာအနီးနှင့် လှိုင်မြစ်တစ်လျှောက်ရှိ သစ်ပင်အနည်းငယ်နှင့် ဒီရေတောများ မရှိကြောင်းကို ၂၀၁၉ ခုနှစ်၊ မေလမှ ဇွန်လအတွင်း ကွင်းဆင်းလေ့လာမှုပြုလုပ်ခဲ့ပြီး၊ သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဌာနမှ စီမံကိန်း၏ နယ်ပယ်တိုင်းတာသတ်မှတ်ခြင်း အစီရင်ခံစာကို အတည်ပြုပြီးနောက် ၂၀၂၁ ခုနှစ်၊ နိုဝင်ဘာလတွင် ထပ်မံကွင်းဆင်းလေ့လာမှုအရ သိရှိရပါသည်။ အဆိုပြုစီမံကိန်းသည် လှိုင်မြစ်မှ ၀.၁၄မိုင် အကွာတွင် တည်ရှိပါသည်။

**(ခ) ရုပ်ပတ်ဝန်းကျင်။** ။ စီမံကိန်းသည် ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ အရှေ့လောင်ဂျီ တွင် ၉၅° ၅၈' ၆.၄" နှင့် မြောက်လတ္တီတွဒ် ၁၇° ၉' ၂၁.၂၄" ကြား၊ ပျမ်းမျှပင်လယ်ရေမျက်နှာပြင် အထက် ၂၇ ပေ (၈.၂ မီတာ)တွင် တည်ရှိ၍ ပူအိုက်စိုစွတ်သောဥတုဖြစ်ပြီး အမြင့်ဆုံးအပူချိန် ၃၉.၃ ဒီဂရီစင်တီဂရိတ်နှင့် အနိမ့်ဆုံးအပူချိန် ၁၀ ဒီဂရီစင်တီဂရိတ်ရှိပါသည်။

(ဂ) လူမှုစီးပွားအဆင့်အတန်း။ ။ စီမံကိန်းဧရိယာသည် လူဦးရေ ၂၀၂,၉၀၄ ဦးရှိသည့် မှော်ဘီမြို့နယ်တွင် တည်ရှိသည်။ ၎င်းတွင် ၁၈ နှစ် အထက်အတွက် ၇၀.၄% နှင့် ၁၈ နှစ်အောက် ၂၉.၆ % ပါဝင်သည်။ အိမ်ထောင်စုအရေအတွက်မှာ ၄၆၉၃၇ ဖြစ်ပြီး၊ မိသားစုတစ်စုတွင် ပျမ်းမျှလူဦးရေ ၄.၃ ဦးပါဝင်သည်ဟု ယူဆပါသည်။ ၂၀၁၉ ခုနှစ်စာရင်းအရ အမျိုးသားနှင့် အမျိုးသမီးအချိုးသည် ၁: ၁.၁ ဖြစ်သည်။

မှော်ဘီမြို့နယ်တွင် မြေအသုံးချမှုမှာ အသားတင်စိုက်ဧရိယာ ၆၃၂၇၂ ဧက၊ စက်မှုမြေ ၄၁၁၅ ဧက၊ မြို့ပြ ၁၁၉၃ ဧကနှင့် အခြားမြေများစသည်တို့ဖြစ်ပါသည်။ အဓိကသီးနှံထွက်ရှိမှုမှာ စပါး(နွေ/မတ်သုံး)၊ မြေပဲ(ဆောင်း)၊ မတ်ပဲ၊ ပဲစိမ်း(ဆောင်း)စသည်တို့ဖြစ်ပြီး၊ ရော်ဘာကို နှစ်ရှည်သီးနှံအဖြစ် စိုက်ပျိုးထားပါသည်။ မွေးမြူရေးလုပ်ငန်းအနေဖြင့် နွား၊ ဆိတ်၊ ဘဲနှင့် ကြက် စသည်တို့တို့ မွေးမြူသည်။

မြောင်းတကာစက်မှုဇုန်အပြင် အခြားစက်ရုံအလုပ်ရုံများနှင့် အိမ်တွင်းစက်မှုဇုန်များလည်း မှော်ဘီမြို့နယ်တွင် ရှိပါသည်။ အလုပ်လုပ်နိုင်သည့်ဦးရေ ၁၄၂၈၃၄ ဦးရှိပြီး၊ အလုပ်သမားဦးရေ ၁၁၉၄၇၃ ဦး၊ အလုပ်လက်မဲ့ဦးရေ ၂၃၃၆၁ ဦးဖြင့် အလုပ်လက်မဲ့နှုန်း ၁၉.၅၅% ဖြစ်သည်။ အများစုမှာ အစိုးရဝန်ဆောင်မှုလုပ်ငန်းများ၊ စက်မှုလုပ်ငန်း၊ စက်ရုံအလုပ်သမားများ၊ မွေးမြူရေး၊ ရောင်းဝယ်ရေးနှင့် စိုက်ပျိုးရေးလုပ်ငန်းများဖြင့် အသက်မွေးဝမ်းကျောင်းပြုကြပါသည်။

(ဃ) ပြည်သူ့ကျန်းမာရေးနှင့် ပညာရေးအဆင့်အတန်း။ ။ မှော်ဘီမြို့နယ်၏ ကျန်းမာရေးကဏ္ဍအနေဖြင့် အစိုးရဆေးရုံ ၃ ရုံ၊ ဆေးခန်း ၅ ခန်းနှင့် ကျန်းမာ ရေးစောင့်ရှောက်မှုဌာန ၃၅ ခုရှိသည်။ အဖြစ်အများဆုံးရောဂါများမှာ ငှက်ဖျား၊ ဝမ်းပျက်ဝမ်းလျှော၊ တီဘီရောဂါ၊ ဝမ်းကိုက်ရောဂါနှင့် အသည်းခြောက်ရောဂါတို့ဖြစ်ပြီး ဆရာဝန်နှင့် လူနာဦးရေအချိုးမှာ ၁:၁၆၉၀၈ ဖြစ်ပါသည်။

ပညာရေးကဏ္ဍအနေဖြင့် မှော်ဘီမြို့နယ်တွင် နည်းပညာကျောင်း တစ်ကျောင်း၊ အထက်တန်းကျောင်း ၁၄ ကျောင်း၊ အလယ်တန်းကျောင်း ၆ ကျောင်းနှင့် မူလတန်းကျောင်း ၁၂၄ ကျောင်းရှိပါသည်။ စိုက်ပျိုးရေး နှင့် အိမ်တွင်းသုံးရေအတွက် အဓိကအရင်းအမြစ်များမှာ မြစ်ရေတင်စီမံကိန်းနှင့် တူးဖော်သည့် စက်ရေတွင်းများမှဖြစ်သည်။ မှော်ဘီမြို့နယ်ရှိပြည်သူများသည် မီးရထား၊ ကုန်းလမ်း နှင့်ရေကြောင်းကို သယ်ယူပို့ဆောင်ရေးအဖြစ် အသုံးပြုကြသည်။

(င) လူမှုဝန်ထမ်းပတ်ဝန်းကျင်။ ။ ပညာရေးနှင့် ကျန်းမာရေးစောင့်ရှောက်မှုအတွက် ရပ်ရွာလူထုကို ဝန်ဆောင်မှုပေးသည့် World Vision ဟုခေါ်သော INGO တစ်ခုရှိသည်။ အမျိုးသမီးရေးရာအဖွဲ့၊ မိခင်နှင့် ကလေးအဖွဲ့၊ မြန်မာနိုင်ငံကြက်ခြေနီအသင်းနှင့် မြန်မာနိုင်ငံမီးသတ်တပ်ဖွဲ့စသည့် အခြားအစိုးရမဟုတ်သည့်အဖွဲ့အစည်းများလည်း ရှိပါသည်။

(စ) မျက်စိပသာဒနရှိမှုနှင့် သာယာအဆင်ပြေမှုများ။ ။ မှော်ဘီမြို့နယ်တွင် ဘော်လုံးအားကစားကွင်းတစ်ကွင်း၊ ရုပ်ရှင်ရုံတစ်ရုံနှင့် အပန်းဖြေကစားကွင်းတစ်ခုရှိသည်။ ထို့ပြင်၊ ဘုရားနှစ်ဆူ၊ ဘုန်းကြီးကျောင်း ၄၅၆ ကျောင်း၊ ဘုရားကျောင်း ၄၀၊ ဗလီ ၇လုံးနှင့် ဟိန္ဒူဘုရားကျောင်း ၂ ကျောင်းရှိပါသည်။

စီမံကိန်းတစ်ခွင် လူမှုပတ်ဝန်းကျင်။ ။ စီမံကိန်းတည်နေရာနှင့် လှိုင်မြစ်ကြားတွင် ကျေးရွာနှစ်ရွာ (က) နှင့် (ခ) ကုန်းကလေးကျေးရွာသည် စီမံကိန်းနှင့် ၂မိုင်ခန့်အကွာတွင် တည်ရှိပြီး ၂၀၁၉ ခုနှစ်အတွင်း ကောက်ယူခဲ့သော အိမ်ထောင်စုလူမှုရေးစစ်တမ်းအရ အဆိုပါကျေးရွာနှစ်ရွာ၏ အခြေခံလူမှုစီးပွားရေး

အခြေအနေသည် မှော်ဘီမြို့နယ်၏ အခြေခံအချက်အလက်လေ့လာချက်တွင် ကိုယ်စားပြုသော်လည်း ကန်ကလေးနှင့် ကုန်းကလေးကျေးရွာများတွင်မူ လျှပ်စစ်မီးမရရှိသေးပါ။

၂၀၁၉ ခုနှစ်၊ ဇွန်လ ၂၉ ရက်နေ့တွင် ကျင်းပပြုလုပ်သော ကနဦးလူထုညှိနှိုင်းအစည်းအဝေးတွင် အဆိုပါ ကျေးရွာများမှ ပါဝင်သူများသည် အဆိုပြုထားသည့်စီမံကိန်းအား ကန့်ကွက်ခြင်းမရှိကြောင်း သိရှိရပါသည်။ စီမံကိန်းသည် ၂၀၂၂ ခုနှစ်၊ ဇန်နဝါရီလကုန်တွင် လူထုညှိနှိုင်းအစည်းအဝေး ထပ်မံကျင်းပရန် ရည်ရွယ်ထားပြီး စီမံကိန်းနှင့်သက်ဆိုင်သူများအစည်းအဝေးအတွက် ကြိုတင်ပြင်ဆင်မှုများကို ဆောင်ရွက်နေဆဲ ဖြစ်ပါသည်။

**အလားအလာရှိသောထိခိုက်မှုများ၊ အန္တရာယ်အကဲဖြတ်မှု၊ အန္တရာယ်စီမံခန့်ခွဲမှုနှင့် လျော့ပါးရေးအစီအမံများ**

ဆောက်လုပ်ရေးနှင့် လုပ်ငန်းလည်ပတ်မှုအဆင့်များအလိုက် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ အကျိုးသက်ရောက်မှုများကို အကဲဖြတ်ခြင်းအား ဂေဟဗေဒ၊ လူမှုစီးပွား သို့မဟုတ် ယဉ်ကျေးမှုဆိုင်ရာ ရှုထောင့်မှ “သိသာထင်ရှားသော” ဖြစ်နိုင်သည့် ဆိုးကျိုးသက်ရောက်မှုများကို ခွဲခြမ်းလေ့လာခဲ့ပါသည်။ ကောင်းမွန်သောအကျိုးသက်ရောက်မှုများကို အစီမံခန့်ခွဲခြင်းဖြင့် ဖော်ပြပြီး အကဲဖြတ်ချင့်ချိန်မှုကို အောက်ပါ အတိုင်း အကျဉ်းချုံးဖော်ပြထားပါသည်။

**ဇယား (၆) ရေနံအစာကြိတ်စက်ရုံစီမံကိန်းအတွက် သက်ရောက်အကဲဖြတ်မှု Matrix အကျဉ်းချုပ်**

ဆောက်လုပ်သည့်ကာလ			စီမံကိန်းလည်ပတ်သည့်ကာလ		
စဉ်	စိစစ်သည့် အဓိကအချက်များ	အဆင့် သတ်မှတ်ချက်	စဉ်	စိစစ်သည့် အဓိကအချက်များ	အဆင့် သတ်မှတ်ချက်
ရုပ်ဖိုနှင့် ဓာတုဗေဒဆိုင်ရာထိခိုက်မှု			ရုပ်ဖိုနှင့် ဓာတုဗေဒဆိုင်ရာ ထိခိုက်မှု		
၁	မျက်နှာပြင်ရေအရည်အသွေး ပြောင်းလဲမှု	နိမ့်	၁	မျက်နှာပြင်ရေအရည်အသွေး ပြောင်းလဲမှု	နိမ့်
၂	မြေအောက်ရေ အရည်အသွေး ပြောင်းလဲမှု	နိမ့်	၂	မြေအောက်ရေ အရည်အသွေး ပြောင်းလဲမှု	နိမ့်
၃	ဒေသအတွင်း ရေစီးရေလာ ပြောင်းလဲမှု	နိမ့်	၃	ဒေသအတွင်း ရေစီးရေလာ ပြောင်းလဲမှု	နိမ့်
၄	ရေတိုက်စားမှုနှင့် အနည်ကျမှု	နိမ့်	၄	ရေတိုက်စားမှုနှင့် အနည်ကျမှု	နိမ့်
၅	လေအရည်အသွေး ပြောင်းလဲမှု	အလယ် အလတ်	၅	လေအရည်အသွေး ပြောင်းလဲမှု	အလယ် အလတ်
၆	ပတ်ဝန်းကျင်အသံညစ်ညမ်းမှု	အလယ် အလတ်	၆	ပတ်ဝန်းကျင်အသံညစ်ညမ်းမှု	အလယ် အလတ်
၇	ရေနံသတ္တဝါ ပြောင်းလဲမှု	နိမ့်	၇	ရေနံသတ္တဝါ ပြောင်းလဲမှု	နိမ့်

၈	ကုန်းနေသတ္တဝါ ပြောင်းလဲမှု	နိမ့်	၈	ကုန်းနေသတ္တဝါ ပြောင်းလဲမှု	နိမ့်
၉	ရောဂါကူးစက်နိုင်မှု အခြေအနေ	နိမ့်	၉	ရောဂါကူးစက်နိုင်မှု အခြေအနေ	အလယ် အလတ်
၁၀	မြေမျက်နှာပြင် ပြောင်းလဲမှု	အလယ် အလတ်	၁၀	မြေမျက်နှာပြင် ပြောင်းလဲမှု	နိမ့်
၁၁	အမွေအနှစ်နေရာ ပြောင်းလဲမှု	နိမ့်	၁၁	အမွေအနှစ်နေရာ ပြောင်းလဲမှု	နိမ့်
၁၂	သဘာဝအလျောက် နေထိုင်ရာဒေသ များ ပြောင်းလဲခြင်း	နိမ့်		သဘာဝအလျောက် နေထိုင်ရာဒေသ များ ပြောင်းလဲခြင်း	နိမ့်
လူမှုစီးပွားရေးနှင့် လူမှုရေးဆိုင်ရာထိခိုက်မှုများ			လူမှုစီးပွားရေးနှင့် လူမှုရေးဆိုင်ရာ ထိခိုက်မှုများ		
၁	ကိုယ်ပိုင်ပစ္စည်းများ ပျက်စီးဆုံးရှုံးခြင်းအရပြောင်းလဲမှု	နိမ့်	၁	ကိုယ်ပိုင်ပစ္စည်းများ ပျက်စီးဆုံးရှုံးခြင်းအရပြောင်းလဲမှု	နိမ့်
၂	ယဉ်ကျေးမှုအမွေအနှစ်များ ပြောင်းလဲမှု	နိမ့်	၂	ယဉ်ကျေးမှုအမွေအနှစ်များ ပြောင်းလဲမှု	နိမ့်
၃	လူအများ ပြောင်းရွှေ့နေထိုင်မှု	နိမ့်	၃	လူအများ ပြောင်းရွှေ့နေထိုင်မှု	နိမ့်
၄	ယာဉ်သွားယာဉ်လာ/ယာဉ်ကြော ပိတ်ဆို့မှု	အလယ် အလတ်	၄	ယာဉ်သွားယာဉ်လာ/ယာဉ်ကြော ပိတ်ဆို့မှု	အလယ် အလတ်
၅	ငါးဖမ်းလုပ်ငန်း ပြောင်းလဲမှု	နိမ့်	၅	ငါးဖမ်းလုပ်ငန်း ပြောင်းလဲမှု	နိမ့်
၆	ဒေသအတွင်း အသက်မွေးဝမ်း ကျောင်းအခွင့်အလမ်း များဝင်ငွေနှင့် လုပ်အားခများပြောင်းလဲခြင်း	အလယ် အလတ်	၆	ဒေသအတွင်း အသက်မွေးဝမ်း ကျောင်းအခွင့်အလမ်း များဝင်ငွေနှင့် လုပ်အားခများပြောင်းလဲခြင်း	အလယ် အလတ်
၇	ဒေသအတွင်း ကုန်သွယ်စီးပွား ဝင်ငွေ /အခွင့်အလမ်း များပြောင်းလဲခြင်း	အလယ် အလတ်	၇	ဒေသအတွင်း ကုန်သွယ်စီးပွား ဝင်ငွေ /အခွင့်အလမ်း များပြောင်းလဲခြင်း	အလယ် အလတ်
၈	မျက်စိပသာဒနရှိမှုများ ပြောင်းလဲခြင်း	အလယ် အလတ်	၈	မျက်စိပသာဒနရှိမှုများ ပြောင်းလဲခြင်း	နိမ့်
၉	လူနေအဆောက်အအုံ/ ဆက်သွယ်ရေးအရင်းအမြစ်များ ပြောင်းလဲခြင်း	နိမ့်	၉	လူနေအဆောက်အအုံ/ ဆက်သွယ်ရေးအရင်းအမြစ်များ ပြောင်းလဲခြင်း	နိမ့်

**အန္တရာယ်အကဲဖြတ်မှုနှင့် အန္တရာယ်စီမံခန့်ခွဲမှု။** ။ ဤအစီရင်ခံစာ၏ တစ်စိတ်တစ်ပိုင်းအနေဖြင့် စီမံကိန်း၏ လုပ်ငန်းလည်ပတ်ဆောင်ရွက်မှုများမှ သိသာထင်ရှားသော ညစ်ညမ်းမှုအန္တရာယ်ဖြစ်နိုင်ခြေအဆင့် (လူသို့မဟုတ် အခြားဇီဝသက်ရှိများကို အန္တရာယ်ဖြစ်စေနိုင်သော ညစ်ညမ်းမှုအဆင့်များ) ကို ဆုံးဖြတ်ရန် ဆောင်ရွက်ခဲ့ပါသည်။ အန္တရာယ်ချင့်ချိန်အကဲဖြတ်မှုတန်ဖိုးကို ဆုံးဖြတ်ရန်အတွက် ရွေးချယ်ထားသော လုပ်ဆောင်ချက်များတွင် ချင့်ချိန်အကဲဖြတ်မှုအဆင့်သတ်မှတ်ချက်စနစ်ကို ကျင့်သုံးထားပါသည်။ ကြိမ်နှုန်း၊



ဖြစ်နိုင်ခြေ၊ သက်ရောက်မှု၊ အကျိုးသက်ရောက်မှု၊ ချုပ်ကိုင်မှု၊ စွန့်ထုတ်မှုအဆိပ်သင့်မှု၊ ဖြစ်ရပ်အာရုံခံနိုင်စွမ်းဆိုင်ရာ ပြောင်းလဲမှုဖြစ်စေနိုင်သော အစိတ်အပိုင်းများအပေါ် အခြေခံ၍ အန္တရာယ်တန်ဖိုးကို “အန္တရာယ်နိမ့်” အဖြစ် နိဂုံးချုပ်ထားပြီး၊ လုပ်ငန်းဆောင်ရွက်မှုများသည် သဘာဝဘေးအန္တရာယ်များသို့မဟုတ် ပြင်းထန်သော ရာသီဥတုဖြစ်ရပ်များကို ဖယ်ထုတ်ပြီး HSE စံနှုန်းများကို လိုက်နာထားပါသည်။

Aqua Feed ထုတ်လုပ်မှုတွင် တွေ့ရှိနိုင်သော ဖြစ်နိုင်ခြေအန္တရာယ်များမှာ ဓာတုညစ်ညမ်းမှု၊ (က) u)mycotoxins နှင့် (ဂ) အကုဇီဝညစ်ညမ်းမှု တို့ဖြစ်ပါသည်။ ဖြစ်နိုင်ခြေရှိသော ချို့ယွင်းချက်များမှာ ဆွေးနွေး နေသော အစာများနှင့် မှိုများပျက်စီးခြင်းတို့ဖြစ်သည်။ ဖြစ်နိုင်ခြေရှိသော ချို့ယွင်းချက်များကို ရှောင်ရှားရန် ဘေးအန္တရာယ်ဆိုင်ရာစီမံခန့်ခွဲမှုများမှာ-

- အစားအစာနှင့် လတ်ဆတ်သော စတော့များကို ဝယ်ယူပြီး ၎င်းတို့၏ သိုလှောင်မှုသက်တမ်း မကုန်ဆုံးမီတွင် ဝယ်ယူပြီး လှည့်ပတ်အသုံးပြုသင့်သည်။
- ပုပ်သိုးခြင်း၊ မှိုကြီးတွယ်ခြင်းနှင့် ညစ်ညမ်းခြင်းတို့ကို ကာကွယ်ရန် အေးပြီး ခြောက်သွေ့သောနေရာများတွင် သိမ်းဆည်းထားသင့်ပါသည်။ ထုတ်လုပ်သူညွှန်ကြားချက်နှင့်အညီ စိုစွတ်သောအစာများကို ကောင်းစွာ အအေးခန်းထဲ၌ ထားသင့်ပါသည်။
- အစားအစာ၏ ပါဝင်ပစ္စည်းများတွင် အန္တရာယ်ကင်းသော ပိုးသတ်ဆေးများ၊ ဓာတုညစ်ညမ်းမှုများ၊ အကုဇီဝအဆိပ်အတောက်များ သို့မဟုတ် အခြားညစ်ညမ်းစေသောအရာများ မပါဝင်သင့်ပါ။
- စက်မှုလုပ်ငန်းဖြင့် ထုတ်လုပ်ထားသော ဖြည့်စွက်စာများနှင့် စက်မှုလုပ်ငန်းဖြင့် ထုတ်လုပ်ထားသော အစားအစာပါဝင်ပစ္စည်းများကို မှန်ကန်စွာ တံဆိပ်ဆက်ထားသင့်ပါသည်။ ၎င်းတို့၏ ဖွဲ့စည်းပေါင်းစပ်မှုသည် တံဆိပ်ပေါ်ရှိ ကြော်ငြာချက်နှင့် ကိုက်ညီရမည်ဖြစ်ပြီး ၎င်းတို့သည် တစ်ကိုယ်ရေ သန့်ရှင်းမှုဖြင့် လက်ခံနိုင်ရမည်။
- ပါဝင်ပစ္စည်းများသည် လက်ခံနိုင်ဖွယ်ရှိရမည်ဖြစ်ပြီး၊ အသုံးပြုပါက လူ့ကျန်းမာရေးကို ထိခိုက်စေနိုင်မည့် အခြားညစ်ညမ်းပစ္စည်းများ၊ ရောဂါပိုးမွှားများ၊ mycotoxins ၊ ပေါင်းသတ်ဆေးများ၊ ပိုးသတ်ဆေးများနှင့် အခြားညစ်ညမ်းပစ္စည်းများအတွက် ပြဌာန်းထားသော စံနှုန်းများနှင့် ကိုက်ညီမှု ရှိရပါသည်။
- မှန်ကန်ကြောင်း အတည်ပြုထားသည့် အရောင်သိပ်သည်းမှုကို အစာတွင်ထည့်သွင်းသင့်ပါသည်။

### သဘာဝပတ်ဝန်းကျင်လျော့ပါးရေးနှင့် စီမံခန့်ခွဲရေးအစီအမံများ

ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်များသည် လျော့ပါးသက်သာစေရေး၊ စောင့်ကြည့်ရေးနှင့် အဖွဲ့အစည်းဆိုင်ရာ စီမံချက်များကို လုပ်ငန်းအကောင်အထည်ဖော် ဆောင်ရွက်နေစဉ်နှင့် လုပ်ငန်းလည်ပတ်နေသည့်ကာလအတွင်း ဆိုးရွားသော သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ထိခိုက်မှုများကို ရှောင်ရှားရန် သို့မဟုတ် ထိန်းချုပ်ရန်နှင့် ဤစီမံချက်များကို အကောင်အထည်ဖော်ရန် လိုအပ်သော လုပ်ဆောင်ချက်များ ဖြစ်ပါသည်။

Aqua Feed ထုတ်လုပ်မှု၏ ကောင်းမွန်သောထုတ်လုပ်မှုအလေ့အကျင့်အတွက် ဤအစီရင်ခံစာ၏ အခန်း ၆တွင် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာကျင့်ထုံးမူကြမ်းနှင့် စက်ရုံတို့ ၅.၆နှင့် ၄.၇ထိန်းသိမ်းမှုဆိုင်ရာ မူကြမ်းကို ဆွေးနွေးထားပါသည်။ စီမံကိန်းအကောင်အထည်ဖော်နေစဉ်အတွင်း အန္တရာယ်များနှင့် လျော့ပါးသက်သာစေရန် ကြိုတင်ကာကွယ်မှုအစီအမံများကို ပေါင်းစပ်ထည့်သွင်းခြင်းအပြင် ပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်၏ ထပ်လောင်းလိုအပ်နိုင်သော ဦးစားပေးအစီအမံများကို အောက်တွင် ဖော်ပြထားပါသည်။

လုပ်ငန်းလည်ပတ်သည့်အဆင့်အတွက် လျော့ပါးသက်သာစေခြင်း

ရှုပ်ထွေးမှုနှင့် ဓာတုဗေဒဆိုင်ရာထိခိုက်မှုများ

စဉ်	ထိခိုက်မှု	အဆင့်သတ်မှတ်ချက်	လျော့ပါးသက်သာစေမည့် စီမံချက်များ	လက်ကျန်သက်ရောက်မှု
၁	မျက်နှာပြင်ရေအရည်အသွေး ပြောင်းလဲမှု	နိမ့်	<b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b> <ul style="list-style-type: none"> <li>- ညစ်ညမ်းသော မုန့်တိုင်းရေများ ဆိုက်ရောက်ခြင်းမှ ကာကွယ်ရန်။</li> <li>- ညစ်ညမ်းသော ပစ္စည်းများ၊ အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများ၊ အဆိပ်အတောက်ဖြစ်စေသော အန္တရာယ်ရှိသောပစ္စည်းများကို သန့်စင်ရန် သို့မဟုတ် ရေထဲတွင် လောင်းချခြင်း၊ ပစ်ချခြင်း မပြုလုပ်ရန်။</li> <li>- အဆီပြန်သော အဝတ်စုတ်များ၊ ဆီစစ်၊ အသုံးပြုထားသောဆီ စသဖြင့် သေးငယ်သော ပြုပြင်ထိန်းသိမ်းမှုပစ္စည်းများကို စုဆောင်း၍ စနစ်တကျစွန့်ပစ်ရန်။</li> <li>- လုပ်ငန်းခွင်ပြင်ပဝန်ဆောင်မှုအတွက် မိုဘိုင်းပစ္စည်းများ။</li> <li>- လုပ်ငန်းခွင်နေရာတွင် ရေနုတ်မြောင်းများ တပ်ဆင်ရန်။</li> </ul>	နိမ့်
၂	မြေအောက်ရေ အရည်အသွေး ပြောင်းလဲမှု	နိမ့်	<b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b> <ul style="list-style-type: none"> <li>- ရေစုပုံသောနေရာများတွင် အဆိပ်အတောက် ဖြစ်စေသော ဒြပ်ပေါင်းများ မတည်ရှိကြောင်း သေချာစေရန်။</li> <li>- ဓာတုဗေဒနည်းအရ ညစ်ညမ်းသောရေများ အား မြေအောက်ရေကို ယိုစိမ့်ပြီး မညစ်ညမ်းစေရန် စီးဆင်းစေခြင်း။</li> </ul>	နိမ့်
၅	လေအရည်အသွေး ပြောင်းလဲမှု	အလယ်အလတ်	<b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b> <ul style="list-style-type: none"> <li>- ယာဉ်အိတ်ဇာများ အပြည့်အဝ လည်ပတ်စေရန်။</li> <li>- ထုတ်လုပ်မှုလုပ်ငန်းစဉ်မှ ထွက်လာသော ဖုန်မှုန့်များ၊ အမှုန်အမွှားများ၊ အနံ့အသက်များ၊ ဓာတ်ငွေ့ သို့မဟုတ် အခိုးအငွေ့များကို စုပ်ယူရန် သက်ဆိုင်ရာညစ်ညမ်းမှုထိန်းချုပ်ရေးစက်များကို အသုံးပြုရန်။</li> <li>- အမှိုက်များ၊ အသီးအရွက်များကို မီးရှို့ခြင်း မပြုလုပ်ရန်။</li> <li>- လေထန်သောနေရာများတွင် မြေဆီလွှာအမှုန် အမွှားများ လွင့်စင်ခြင်းမရှိစေရန်။</li> </ul>	နိမ့်



			<ul style="list-style-type: none"> <li>- ထိတွေ့လေ့ရှိသော အလုပ်နေရာများတွင် ဖုန်မှုန့်များကို လျှော့ချရန်အတွက် မြေကြီးရေ ဖြန်းခြင်းများ ပြုလုပ်ရန်။</li> </ul>	
၆	ပတ်ဝန်းကျင်အသံညစ်ညမ်းမှု	အလယ် အလတ်	<b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b> <ul style="list-style-type: none"> <li>- ယာဉ်အိတ်ဇာများ အပြည့်အဝ လည်ပတ်စေရန်။</li> <li>- ပတ်ဝန်းကျင်အား ဆူညံသံများမှ ကာကွယ်ရန် ညဆိုင်းချိန်အတွင်း ကောင်းမွန်စွာ ထိန်းသိမ်း ထားသောစက်များနှင့် ယာဉ်များကို အသုံးပြုရန်။</li> <li>- စီမံကိန်းနှင့်ပတ်သက်သည့် လမ်းပန်းဆက် သွယ်မှုများကို ရပ်ရွာဒေသများ၌ လျော့ချ အသုံးပြုရန်။</li> <li>- ထုတ်လုပ်မှုစက်များတွင် အသံတိတ်စက်များ ကို အသုံးပြုခြင်း၊ ပစ္စည်းပေးပို့ခြင်း၊ ဂျင်နေရေ တာ သို့မဟုတ် ဘွိုင်လာလုပ်ဆောင်နေစဉ် အတွင်း ဆူညံသံထိန်းချုပ်စက်များ၊ လက်ခံနိုင် သော သတ်မှတ်ချက်အတွင်း ဆူညံသံအဆင့် ကို သေချာစေရန်။</li> <li>- ခြံစည်းရိုးများ၊ အတားအဆီးများ သို့မဟုတ် ဒရန်းများကဲ့သို့သော ဆူညံသံထိန်းချုပ်သည့် နည်းများ အသုံးပြုရန် ကြီးထွားမြန်သစ်ပင် ) (များ စိုက်ပျိုးခြင်း စသည်ဖြင့်</li> <li>- စီမံကိန်းနေရာနှင့် လူနေရပ်ကွက်များအကြား တွင် ဆူညံသံသက်ရောက်မှုကို လျော့ပါးစေ ရန် ကြားခံရန် ဟင်းလင်းနေရာများ၊ ) ကို ထိန်းသိမ်းရန်။ (သစ်ပင်တန်းများ</li> </ul>	နိမ့်
၉	ရောဂါကူးစက်နိုင်မှု အခြေအနေ	အလယ် အလတ်	<b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b> <ul style="list-style-type: none"> <li>- အစားအစာနှင့်အော်ဂဲနစ်စွန့်ပစ်ပစ္စည်းများကို အလုံပိတ်ကွန်တိန်နာများတွင် သိမ်းဆည်းရန်။</li> <li>- ပုံမှန်စွန့်ပစ်ပစ္စည်းစုဆောင်းခြင်းနှင့် စွန့်ပစ်ခြင်း ကို သေချာစေရန်။</li> <li>- နေ့စဉ်လုပ်ငန်းခွင်ကို သန့်ရှင်းပြီး အမှိုက်ကင်း စင်အောင် ထားရန်။</li> <li>- ခြင်ပေါက်ပွားမှုကို ဟန့်တားရန်အတွက် ရေဝပ် သည့်နေရာများ ဖန်တီးခြင်းမှ ရှောင်ကြဉ်ရန်။</li> <li>- တစ်ကိုယ်ရည်သန့်ရှင်းရေး၊ လုပ်ငန်းခွင်ကျန်း မာရေးနှင့် ဘေးကင်းရှင်းရေးကို လုပ်သား များအား အသိပညာပေးခြင်း။</li> <li>- အလုပ်သမားများအတွက် လိုအပ်သလို တစ်ကိုယ်ရည်အကာအကွယ်ပစ္စည်းများ</li> </ul>	နိမ့်

			<p>ဘေးကင်းရေးလက်အိတ်များ၊ နာခေါင်းအုပ်၊ ) အမာခံဦးထုပ်များ၊ ဘွတ်ဖိနပ်များ၊ မျက်မှန်များ ပံ့ပိုးပေးရန်။ (စသည်ဖြင့်</p> <ul style="list-style-type: none"> <li>- အဆိပ်သင့်သောအရည်များနှင့်အခြားအဆိပ် သင့်ပစ္စည်းများကို စနစ်တကျလုံခြုံသောနေရာ များတွင် စုဆောင်းကာ စွန့်ပစ်ရန်အတွက် အလုပ်ပိတ်ပံ့များ ထားရှိရန်။</li> <li>- လုပ်ငန်းခွင်ရှိ အလုပ်သမားများအတွက် လုံလောက်သော အညစ်အကြေးစွန့်ပစ်နေရာ များ ထားရှိပေးရန်။</li> </ul>	
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### လူမှုစီးပွားရေးနှင့် လူမှုရေးဆိုင်ရာထိခိုက်မှုများ

စဉ်	ထိခိုက်မှု	အဆင့် သတ်မှတ်ချက်	လျော့ပါးသက်သာစေမည့် စီမံချက်များ	လက်ကျန် သက်ရောက်မှု
၄	ယာဉ်သွားယာဉ်လာ/ ယာဉ်ကြော ပိတ်ဆို့မှု	အလယ် အလတ်	<p><b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b></p> <ul style="list-style-type: none"> <li>- စက်ရုံသုံးယာဉ်များ၏အမြန်နှုန်းကန့် သတ်ချက်အားလုံးကို လိုက်နာရန်။</li> <li>- ညဘက်အချိန်နှင့် အများပြည်သူ သွား လာမှု အများဆုံး အချိန်တွင် ဖြစ်နိုင် လျှင် လမ်းအသုံးပြုမှုကို ရှောင်ကြဉ်ရန်။</li> <li>- ဖြစ်နိုင်လျှင် လူနေရပ်ကွက်များနှင့် ဝေး ရာတွင် လုပ်ငန်းသုံးသယ်ယူပို့ဆောင် ရေး ပြုလုပ်ရန်။</li> </ul>	နိမ့်
၅	ငါးဖမ်းလုပ်ငန်း ပြောင်းလဲမှု	နိမ့်	<p><b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b></p> <p>မြစ်ချောင်းများတွင် အညစ်အကြေးစွန့် ထုတ်ခြင်း ထိန်းချုပ်ရန်။</p>	နိမ့်
၆	ဒေသအတွင်း အသက်မွေးဝမ်း ကျောင်းအခွင့်အလမ်း များပင်ငွေနှင့် လုပ်အားခများပြောင်းလဲခြင်း	အလယ် အလတ်	<p><b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b></p> <p>ဒေသခံအလုပ်သမားများကို ဦးစားပေးခန့် ထားရန်။</p>	နိမ့်
၇	ဒေသအတွင်း ကုန်သွယ်စီးပွား ပင်ငွေ /အခွင့်အလမ်း များပြောင်းလဲခြင်း	အလယ် အလတ်	<p><b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b></p> <p>ဒေသအတွင်း တင်သွင်းသူများထံမှ ကောင်းမွန်သော ဦးစားပေးအရင်းအမြစ် များနှင့် ဝန်ဆောင်မှုများကို ဦးစားပေး စဉ်းစားပေးရန်။</p>	နိမ့်
၈	မျက်စိပသာဒနရှိမှုများ ပြောင်းလဲခြင်း	နိမ့်	<p><b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b></p> <ul style="list-style-type: none"> <li>- ထိရောက်သော အမှိုက်စီမံခန့်ခွဲမှု အစီအစဉ်များ ထားရှိရန်။</li> <li>- လုပ်ငန်းခွင်နေရာအား သင့်လျော်သော ခြံစည်းရိုးများဖြင့် ကာထားရန်။</li> </ul>	နိမ့်
၉	လူနေအဆောက်အဦ/ ဆက်သွယ်ရေးအရင်းအမြစ်မျ	နိမ့်	<p><b>EMP နှင့် အဓိကလုပ်ဆောင်ရမည့်မှာ -</b></p> <p>လုပ်ငန်းခွင်သို့ လာရောက်တိုးချဲ့ထား သော</p>	နိမ့်

၇: ပြောင်းလဲခြင်း	အများပြည်သူချိတ်ဆက်မှုများကို ခွင့်ပြုရန် စဉ်းစားရန်။	
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## ဖြစ်နိုင်ချေတိုးပွားလာသည့် သက်ရောက်မှုများအကဲဖြတ်ခြင်း

အဓိကအလားအလာရှိသော သက်ရောက်မှုများမှာ-

- အနီးပတ်ဝန်းကျင်ရှိ အခြားစီမံကိန်းများ၏ ဆောက်လုပ်ဆဲကာလနှင့် လုပ်ငန်းလည်ပတ်နေသည့် အချိန်တွင် မြေပေါ်အခြေခံသောစီးဆင်းမှုနှင့် ရေအခြေခံလုပ်ငန်းများကြောင့် ရေအရည်အသွေး ထိခိုက်မှုများ၊
- စီမံကိန်းတည်ဆောက်ခြင်းနှင့် လည်ပတ်ခြင်းမှတစ်ဆင့် စွန့်ပစ်ပစ္စည်းများ ထုတ်လုပ်ခြင်းနှင့် စွန့်ပစ်ခြင်းမှ သက်ရောက်မှုများ၊
- ဤစီမံကိန်းနှင့် အနီးတစ်ဝိုက်ရှိအခြားစီမံကိန်းများ၏ ယာဉ်၊ မီးစက်နှင့် ဘိုလ်လာလည်ပတ်မှုများ၏ သက်ရောက်မှုများ၊
- အသက်မွေးဝမ်းကြောင်းလုပ်ငန်းများအတွက် လုပ်ငန်းခွင်အပေါ် မှီခိုနေရသော ရွှေ့ပြောင်းဒုက္ခသည်များအတွက် လူမှုစီးပွားရေးဆိုင်ရာ သက်ရောက်မှုများနှင့်
- မတော်တဆယိုဖိတ်မှုများ၊ ယိုစိမ့်မှုများ၊ လက်ရှိစီမံကိန်းနှင့် အနီးတစ်ဝိုက်ရှိအခြားစီမံကိန်းများမှ ထုတ်လွှတ်သော ဖုန်မှုန့်များ သို့မဟုတ် အမှုန်အမွှာများမှ လေအရည်အသွေးနှင့် ပြည်သူ့ကျန်းမာရေးကို ထိခိုက်စေခြင်း။

De Heus Aqua Feed Mill ခြံဝင်းအနီးတစ်ဝိုက်တွင် အခြားပရောဂျက်နှစ်ခုသာ ရှိကြောင်းတွေ့ရှိရပါသည်။ (က) De Heus တိရစ္ဆာန်(မွေးမြူရေး)အစာကြိတ်စက်နှင့် (ခ) အထည်အလိပ်စက်ရုံနှင့် (ဂ) အနီးအနားတွင် ဖွံ့ဖြိုးတိုးတက်မှုမရှိသေးသော၊ အသုံးမပြုရသေးသော မြေအချို့များတွေ့ရပြီး၊ ဆူညံသံနှင့်လေထုအရည်အသွေးအဆင့်များသည် သတ်မှတ်ထားသောအချိန်အတိုင်း အတာတစ်ခုအထိ ခွင့်ပြုနိုင်သော ကန့်သတ်ချက်များကို မကြာခဏ ကျော်လွန်တတ်သော်လည်း အထက်ဖော်ပြပါသက်ရောက်မှုများကို သိသာထင်ရှားမှုနည်းသည်ဟု တွက်ဆထားပါသည်။ သို့သော်လည်း၊ စီမံကိန်းအတွက် ကောင်းမွန်သော ကုန်ထုတ်လုပ်မှုအလေ့အကျင့်များနှင့် စက်ရုံထိန်းသိမ်းမှုအစီအစဉ်များကို လိုက်နာပြီး သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအတွက် အနီးနားရှိ စက်ရုံများနှင့် သင့်လျော်သောညှိနှိုင်းဆောင်ရွက်ခြင်းဖြင့် အထက်ဖော်ပြပါသက်ရောက်မှုများအားလုံးကို လျော့ပါးသွားစေနိုင်ပါသည်။

### သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်အနှစ်ချုပ်

အဆိုပြုစီမံကိန်းတင်သွင်းသူ သို့မဟုတ် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှုအစီအစဉ် ပြီးမြောက်အောင် ဆောင်ရွက်မည့်အဖွဲ့အစည်းမှ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်ဖြစ်မြောက်ရေးအဖွဲ့အား ဖွဲ့စည်းရမည် ဖြစ်ပါသည်။

- သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ် လုပ်ဆောင်ချက်များကို သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ အကဲဖြတ်သူမှ စောင့်ကြပ်ကြည့်ရှုရန်ဖြစ်ပါသည်။
- သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ် ဆောင်ရွက်မှုများကို သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲသည့်အရာရှိ (EMO) ထားရှိ၍ ၎င်းမှ စီမံခန့်ခွဲပေးရန်ဖြစ်ပါသည်။

- သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာလုပ်ငန်းခွင်အရာရှိ (ESO) ထားရှိ၍ ၎င်းမှ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲသည့်အရာရှိ (EMO) အား ကူညီဆောင်ရွက်ပေးမည် ဖြစ်ပါသည်။

လေ့လာတွေ့ရှိရသော ပတ်ဝန်းကျင်ထိခိုက်မှုများအတွက် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှုအစီအစဉ်များမှာ အောက်ပါအတိုင်း ဖြစ်ပါသည်။

- ၁။ ရေအရည်အသွေးစီမံခန့်ခွဲမှု၊ မြေအောက်ရေထိန်းသိမ်းမှုနှင့် သန့်ရှင်းသောသောက်သုံးရေ ရရှိရေးအစီအစဉ်
- ၂။ ရေနုတ်မြောင်းပုံစံ စီမံခန့်ခွဲမှုအစီအစဉ်
- ၃။ လေထုအရည်အသွေး စီမံခန့်ခွဲမှုအစီအစဉ်
- ၄။ စွန့်ပစ်အညစ်အကြေးများ စီမံခန့်ခွဲမှုအစီအစဉ်
- ၅။ ယာဉ်လမ်းကြော စီမံခန့်ခွဲမှုအစီအစဉ်
- ၆။ အများပြည်သူများနှင့်တွေ့ဆုံမှု နှင့် ဖွံ့ဖြိုးတိုးတက်စေရေးအစီအစဉ်
- ၇။ လုပ်ငန်းခွင် လုံခြုံရေးနှင့် ကျန်းမာရေးအစီအစဉ်
- ၈။ အရေးပေါ်ကယ်ဆယ်ရေးအစီအစဉ်
- ၉။ အသင်းအဖွဲ့၏လူမှုရေး တာဝန်ခံမှု
- ၁၀။ ပြန်လည်ပြုပြင်မွမ်းမံခြင်း အစီအစဉ်
- ၁၁။ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြပ်ကြည့်ရှုခြင်း အစီအစဉ်

အထက်တွင်ဖော်ပြထားသော သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာစီမံခန့်ခွဲမှုအစီအစဉ်ခွဲများကို အောက်တွင်ဖော်ပြထားသည့်ကဏ္ဍအလိုက် ဤအစီရင်ခံစာ၏ အခန်း (၈)တွင် ထည့်သွင်းဖော်ပြထားပါသည်။

- EMP အစီအစဉ်ခွဲအသီးသီးတို့၏ ရည်ရွယ်ချက်
- သက်ဆိုင်ရာဥပဒေနှင့်ညီညွတ်သော လိုအပ်ချက်များ
- EMP အစီအစဉ်ခွဲများပြီးမြောက်ရေး လုပ်ငန်းစဉ်
- EMP အစီအစဉ်ခွဲများ စီမံခန့်ခွဲသည့် လုပ်ဆောင်ချက်
- EMP အစီအစဉ်ခွဲများအား စောင့်ကြပ်ကြည့်ရှုသည့် အစီအစဉ်
- EMP အစီအစဉ်ခွဲများအား ရည်ညွှန်းဖော်ပြသည့်အချက်များ
- EMP စမ်းသပ်မှုပြုလုပ်သည့် နေရာများ
- စောင့်ကြပ်ကြည့်ရှုမှုပြုလုပ်သည့် အကြိမ်အရေအတွက်
- EMP အစီအစဉ်ခွဲများအတွက် ခွဲဝေချမှတ်ပေးသည့် ခန့်မှန်းကုန်ကျငွေ
- သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ်ခွဲများအတွက် တာဝန်ရှိသည့်ပုဂ္ဂိုလ်များအဖွဲ့

စီမံကိန်း၏ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စီမံခန့်ခွဲမှုအစီအစဉ် ပြီးမြောက်နိုင်ရေးအတွက် နှစ်စဉ်ခန့်မှန်းကုန်ကျစရိတ်မှာ မြန်မာငွေကျပ် (၂၂) သန်းဖြစ်ပါသည်။ သို့သော်၊ စီမံကိန်းကုန်ကျစရိတ်သည် လက်ရှိခန့်မှန်းပမာဏထက်ကျော်လွန်ခဲ့ပါက အဆိုပြုတင်သွင်းသူဖက်မှ လိုအပ်သလို ကုန်ကျခံ မည်ဖြစ်ပါသည်။

### အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် ထုတ်ဖော်ချက်

အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်းနှင့် အသိပညာပေးအစီအစဉ်တွင် အဆင့်(၃)ဆင့်ပါဝင်ပါသည်။

- (၁) အဆိုပြုထားသော လုပ်ငန်းနယ်ပယ်များရှိ အိမ်ထောင်စုနှင့် ရပ်ကွက်အဆင့် (လူမှုစီးပွားရေးစစ်တမ်း) တွင် အလွတ်သဘောတွေ့ဆုံပွဲများ၊

(၂) အလျဉ်းသင့်သလို အစိုးရအဖွဲ့အစည်းများနှင့် NGO အဖွဲ့အစည်းများနှင့် သီးသန့်တွေ့ဆုံဆွေးနွေးမှုများ။

(၃) အစီရင်ခံစာမူကြမ်း တွေ့ရှိချက်များကိုတင်ပြရန်အတွက် အဓိကသက်ဆိုင်သူများအတွက် တရားဝင် အလုပ်ရုံဆွေးနွေးပွဲ၊ ညှိနှိုင်းအစည်းအဝေးများ။

အဆိုပြုထားသောစီမံကိန်းဧရိယာနှင့် အနီးပတ်ဝန်းကျင်တွက် လူများ အခြေချနေထိုင်မှုမရှိသည့်အပြင်၊ ပြန်လည်နေရာချထားရေးအစီအစဉ်အတွက် ပြဿနာမရှိကြောင်း တွေ့ရှိရပါသည်။

**သဘာဝပတ်ဝန်းကျင်နှင့်လူမှုစီးပွားဆိုင်ရာသက်ရောက်မှုများကို ချင့်ချိန်အကဲဖြတ်ခြင်းလုပ်ငန်းများအတွက် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း။** ။ အထက်တွင်ဖော်ပြခဲ့သည့်အတိုင်း သက်ဆိုင်သူများ

အစည်းအဝေး (Pre Public Consultation Meeting) ကို ESIA လုပ်ငန်း၏ နယ်ပယ်တိုင်းတာသည့် အဆင့်တွင် ကျင်းပခဲ့သော်လည်း အဓိကသတင်းပေးအင်တာဗျူး (Key Informant Interviews) များမှအပ အခြားသော လူထုတွေ့ဆုံပွဲ များ ထပ်မံကျင်းပခဲ့ခြင်းမရှိပေ။

အကြောင်းအရင်းမှာ လိုအပ်သည့်သက်ဆိုင်သူများ၏ ပူးပေါင်းပါဝင်မှု ရရှိနိုင်မှုအား ပိုမိုသိရှိလာသော်လည်း၊ အစိုးရဝန်ထမ်းများနှင့် ဒေသခံပြည်သူများကဲ့သို့သော သက်ဆိုင်ရာပြည်သူများကို လိုအပ်သည့် သိပ္ပံနည်း ပညာစက်ကိရိယာများဖြင့် သို့မဟုတ် ထိရောက်စွာ ပါဝင်နိုင်ရန်၊ Zoom ဖြင့် တွေ့ဆုံဆွေးနွေးနိုင်ရန်အတွက် လိုအပ်သောကျွမ်းကျင်မှုများမရှိကြောင်း သိရှိ ရပါသည်။ ထို့ပြင်၊ မြန်မာနိုင်ငံတွင် Covid-19 ရောဂါပျံ့နှံ့မှု အရှိန်အဟုန်ပြင်းထန်လာခြင်းနှင့် ကျန်းမာရေးနှင့် အားကစားဝန်ကြီးဌာန၏ ညွှန်ကြားချက်များကို လိုက်နာ ဆောင်ရွက်ခြင်းဖြင့် ရေနေအစာကြိတ်စက်ရုံစီမံကိန်းတွင် ပါဝင်သူများကို လူကိုယ်တိုင် စုစည်းနိုင်ခြင်း မရှိပေ။

သို့သော်လည်း၊ အစောပိုင်းကောက်ယူထားသော အိမ်ထောင်စု လူမှုစစ်ထမ်းများအရ ရေနေအစာကြိတ် စက်ရုံစီမံကိန်းကို အကောင်အထည်ဖော်ခြင်းနှင့်ပတ်သက်၍ ကန့်ကွက်မှုမရှိကြောင်း ထုတ်ဖော်ပြောကြား ခဲ့ပြီး၊ အဆိုပါပုဂ္ဂိုလ်များမှာ ဤစီမံကိန်းသည် နိုင်ငံနှင့် လူသားတို့၏ အစားအစာအရင်းအမြစ်အဖြစ် မှီခိုအား ထားရသော ငါးနှင့်ဖိစပ်များအပါအဝင် တိရစ္ဆာန်အားလုံး၏ ကျန်းမာရေးအတွက် လိုအပ်ကြောင်း ဆန္ဒရှိကြပါ သည်။

**ထုတ်ဖော်ခြင်း။** ။ EIA လုပ်ထုံးလုပ်နည်း၏ လိုအပ်ချက်များအရ De Heus Myanmar သည် စီမံကိန်းအတွက် အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးညှိနှိုင်းခြင်း အစည်းအဝေးကို ကျင်းပသောအခါ သက်ဆိုင်ရာသတင်းအချက်အလက်များကို သတင်းစာနှစ်စောင် (အင်္ဂလိပ်ဘာသာနှင့် မြန်မာဘာသာ)ဖြင့် ထုတ်ဖော် ပါမည်။ စီမံကိန်းအချက်အလက်များကို De Heus Myanmar ဝတ်ဆိုဒ်တွင် ရရှိနိုင်မည်ဖြစ်ပြီး ဆိုင်းဘုတ် များကို လုပ်ငန်းခွင်ရုံးတွင် ပြသထားမည်ဖြစ်ပါသည်။

### **Grievance Redress Mechanism**

မကျေနပ်ချက်ပြန်လည်ဖြေရှင်းရေးယန္တရား (GRM)ကို စီမံကိန်းပြင်ဆင်မှုနှင့် အကောင်အထည်ဖော်မှုနှင့် ပတ်သက်၍ အကောင်အထည်ဖော်ဆောင်ရွက်နေသည့် အဖွဲ့အစည်းများထံ တိုင်ကြားစာများတင်နိုင်ရန် ရည်ရွယ်ချက်ဖြင့် စီမံကိန်းအတွက် ပြင်ဆင်ထားခြင်းဖြစ်ပါသည်။

## အဆိုပြုထားသောယန္တရား

စီမံကိန်းအဆိုပြုသူ၏ စီမံကိန်းစီမံခန့်ခွဲမှုယူနစ် (Project Management Unit) သည် စီမံကိန်းလူထု တိုင်ကြားချက်ယူနစ် (Project Public Complaint Unit) အား တည်ထောင်နိုင်ရန် ဗဟိုမှတ်တမ်းတင်ခြင်းနှင့် ပေါင်းစပ်ညှိနှိုင်းရေးယူနစ် အဖြစ် အမျိုးသားသဘာဝပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂) နှင့် ADB ၏ SPS (2009) လိုအပ်ချက်အရ ဆောင်ရွက်မည်ဖြစ်ပြီး၊ လူမှုအသိုက်အဝန်း၏ စိုးရိမ်ပူပန်မှုများကို တားဆီးရန်နှင့် ဖြေရှင်းရန်၊ စီမံကိန်းမှ သဘာဝပတ်ဝန်းကျင် နှင့် လူမှုရေးဆိုင်ရာအကျိုးကျေးဇူးများ ရရှိနိုင်ရန် ကူညီပေးရမည်ဖြစ်ပါသည်။ PMU သည် မကျေနပ်ချက်ပြန်လည်ဖြေရှင်းရေးယန္တရား (GRM) ကို ပြည်တွင်းတွင် လူသိရှင်ကြား ထုတ်ပြန် ရမည်ဖြစ်ပြီး၊ သို့မှသာ ရပ်ရွာလူထုအနေဖြင့် ယင်းယန္တရားနှင့် မိမိပါဝင်ရမည့်အချက်များကို အပြည့်အဝသိရှိနားလည်နိုင်မည်ဖြစ်ပါသည်။ PMU တွင် GRM တည်ထောင်ခြင်းနှင့် PMU မှတစ်ဆင့် ၎င်း၏ ကနဦးအကောင်အထည်ဖော်မှုကို စီမံကိန်း၏ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအရာရှိ (EMO) မှ ပံ့ပိုးပေးမည်ဖြစ်ပါသည်။

## GRM လုပ်ထုံးနည်းနှင့် အချိန်ကာလ

မကျေနပ်ချက်ပြန်လည်ဖြေရှင်းရေးယန္တရားအတွက် လုပ်ထုံးလုပ်နည်းနှင့် အချိန်ကာလကို အောက်ပါအတိုင်း ဖော်ပြထားပါသည်။(ပုံ ၂၆ ကိုကြည့်ပါ။)။ အဆင့်များကို flow diagram တွင် မတူညီသောအရောင်များဖြင့် ကိုယ်စားပြုဖော်ပြထားပါသည်။

အဆင့် (၁) - ဆောက်လုပ်ရေးအဆင့် သို့မဟုတ် လုပ်ငန်းဆောင်ရွက်မှုအဆင့်တွင် စိုးရိမ်ပူပန်မှုများ ဖြစ်ပေါ်လာပါက ထိခိုက်ခံရသူသည် ကန်ထရိုက်တာထံသို့ စာဖြင့် သို့မဟုတ် နှုတ်ဖြင့် တိုင်ကြားချက်တစ်စောင်ကို တိုက်ရိုက်တင်ပြရမည်ဖြစ်ပါသည်။ ဖြစ်နိုင်လျှင် ကန်ထရိုက်တာသည် အဆိုပါပြဿနာကို ထိခိုက်ခံရသူနှင့် တိုက်ရိုက်ဖြေရှင်းပေးရမည်ဖြစ်ပါသည်။ ကန်ထရိုက်တာ/အော်ပရေတာမှ တိုင်ကြားချက်ကို တစ်ပတ်အတွင်း ဖြေရှင်းပေးရမည်ဖြစ်ပြီး၊ ဖြေရှင်းပြီးပါက PPCU သို့ ပေးပို့သင့်ပါသည်။

အဆင့် (၂)- သင့်တော်သောဖြေရှင်းချက်မပေးနိုင်ပါက ကန်ထရိုက်တာသည် တိုင်ကြားမှုကို PMU ထံသို့ အလုပ်ချိန် (၅) ရက်အတွင်း ပေးပို့နိုင်ပါသည်။ တိုင်ကြားချက်ကို PMU သို့ တိုက်ရိုက် သို့မဟုတ် GRM ဝင်ခွင့်အချက်များထဲမှတစ်ဆင့် စာဖြင့် သို့မဟုတ် နှုတ်ဖြင့် တိုင်ကြားရန် ဆုံးဖြတ်နိုင်ပါသည်။ PMU သည် ဖြေရှင်းချက်အား စုံစမ်းစစ်ဆေးဖော်ထုတ်ပြီး တိုင်ကြားသူထံ အလုပ်ချိန် (၅)ရက်အတွင်း ရှင်းလင်းစွာ ပြန်လည်ဖြေကြားပေးရမည်။ တံခွန်ကျပ်စီမံခန့်ခွဲမှုအရာရှိသည် ထိခိုက်ခံရသူအား အကြောင်းပြန်ရာတွင် PMU ကို ကူညီပေးပါမည်။ PMU သည် ကန်ထရိုက်တာများ သို့မဟုတ် အဆောက်အအုံများ၏ အော်ပရေတာများသို့ တိုင်ကြားချက်/မကျေနပ်ချက်ကို အချိန်နှင့်တပြေးညီ အကြံပြုချက်ဖြေရှင်းချက်များကို ပေးပို့ပေးမည်ဖြစ်ပါသည်။ ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အတွင်း ကန်ထရိုက်တာများနှင့် လုပ်ငန်းလည်ပတ်နေစဉ်အတွင်း အော်ပရေတာများသည် ညှိနှိုင်းဖြေရှင်းချက်အပေါ် သဘောတူထားသည့်အတိုင်း အကောင်အထည်ဖော်ဆောင်ရွက်ပြီး ရလဒ်အား PPCU သို့ အလုပ်ချိန်(၇)ရက်အတွင်း အစီရင်ခံတင်ပြမည်ဖြစ်ပါသည်။

**မှတ်ချက်။** ။ စီမံကိန်းသည် မြောင်းတဂါစက်မှုအတွင်း တည်ရှိပြီး လွှမ်းမိုးမှုနယ်မြေ၏ (၂-၅)မိုင် အကွာတွင်ရှိသော ကုန်းကလေးကျေးရွာနှင့် ကံကလေးကျေးရွာများရှိ မြင်သာသည့်လူများ အခြေချနေထိုင်မှုကို စောင့်ကြည့်လေ့လာလျက်ရှိပါသည်။ စီမံကိန်းအကောင်အထည်ဖော်မှုကြောင့် ထိခိုက်ခံရ



သူများထံမှ တိုင်ကြားချက်/မကျေနပ်ချက်တစ်စုံတစ်ရာ ရှိလာပါက အထက်ပါလုပ်ထုံးလုပ်နည်းများကို ကန့်သတ်တာ/ ဆောက်လုပ်ရေးကန့်သတ်တာအစား အဆိုပါကိစ္စကို အဓိကထားဖြေရှင်းရန် တာဝန်ရှိသည့် အော်ပရေတာ/ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အရာရှိထံ လျှောက်ထားနိုင်သည်ဟု မှတ်ယူပါသည်။

### ကောက်နှုတ်ချက်များနှင့် အကြံပြုချက်များ

သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုအကဲဖြတ်ချက်မှာ အောက်ပါအတိုင်းဖြစ်ပါသည်။

၁။ ပရောဂျက်ဖွံ့ဖြိုးတိုးတက်ရေးကို တွန်းအားပေးသည့်အနေဖြင့် ၎င်းတို့သည် အလွန်အပျက်သဘောဆောင်သည့် ဇီဝရုပ်ပိုင်းဆိုင်ရာ သက်ရောက်မှုများ မရှိပါ။ သို့သော်၊ ကျန်းမာရေးထိခိုက်မှုအကဲဖြတ်ခြင်းနှင့် ပတ်ဝန်းကျင်စောင့်ကြည့်လေ့လာခြင်းများဖြစ်သည့် စက်ရုံရှိ ဓာတ်ငွေ့ထုတ်လုပ်မှုအချို့သည် TLV (Threshold Limit Value) ထက် မြင့်မားနေကြောင်း တွေ့ရှိရပါသည်။ ၎င်းတို့သည် ၂၄ နာရီအတွင်းရှိ TLV တန်ဖိုး ၂၀  $\mu\text{g}/\text{m}^3$  သတ်မှတ်ချိန်တွင်  $\text{SO}_2$  တန်ဖိုးသည် ၁၁၈.၈၄  $\mu\text{g}/\text{m}^3$  ဖြစ်သည်ပြီး တစ်နှစ်အတွင်းရှိ တစ်နှစ်အတွင်း T TLV တန်ဖိုး ၂၀  $\mu\text{g}/\text{m}^3$  သတ်မှတ်ချိန်တွင်  $\text{NO}_2$  တန်ဖိုးသည် ၄၂.၅၈  $\mu\text{g}/\text{m}^3$  ဖြစ်ပါသည်။  $\text{CO}_2$  နှင့်  $\text{O}_3$  ကိုပင် ရှာဖွေတွေ့ရှိရသည်။ ဓာတ်ငွေ့နှင့် အခိုးငွေ့များ၏ ဇီဝကမ္မလုပ်ဆောင်ချက်သည် လူကျန်းမာရေးကို အထူးသဖြင့် အလုပ်သမားများနှင့် အနီးနားရှိအသိုင်းအဝိုင်းကို ထိခိုက်စေနိုင်သည်။  $\text{CO}_2$  နှင့်  $\text{NO}_2$  သည် လေ၊ အဆုတ်နှင့် သွေးများတွင် အောက်ဆီဂျင်ချို့တဲ့မှုကို ဖြစ်စေသည်။  $\text{SO}_2$  သည် အောက်ပိုင်းရှိ လေပြွန်နှင့် *Brochina* ကို ယားယံစေပြီး၊  $\text{O}_3$  သည် *bronchides* နှင့် *alveolar sacs* များကို ယားယံစေသည်။ ထို့ကြောင့် လေထုညစ်ညမ်းမှုသည် စူးရှသော အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ကူးစက်ရောဂါများ၊ နာတာရှည်လည်ချောင်းနာခြင်း၊ အဆုတ်လေရှူလမ်းကြောင်းဆိုင်ရာရောဂါများ၊ အဆုတ်လေကြောင်းဆိုင်ရာရောဂါများနှင့် *bronchial asthma* ကဲ့သို့သော ဆေးဘက်ဆိုင်ရာအခြေအနေများကို ပိုမိုဆိုးရွားစေသည့် အကြောင်းရင်းတစ်ခုအဖြစ် သိသိသာသာ ပံ့ပိုးပေးပါသည်။

၂။ ထုတ်လွှတ်သော ဖုန်မှုန့်များ၊ အမှုန်အမွှားများ၊ ရေခွေးငွေ့များ ထုတ်လုပ်မှု၊ ရေနေအစာထုတ်လုပ်မှုလုပ်ငန်းစဉ်များမှ အနံ့အသက်ဆိုးများ ထွက်လာနိုင်ခြေများကို မျှော်လင့်ထားသောကြောင့် GMP ကို ထည့်သွင်းစဉ်းစားရန် အကြံပြုထားပြီး ဤအစီရင်ခံစာ၏ အခန်း ၆-၈ တွင် ဆွေးနွေးထားသည့်အတိုင်း၊ ဆိုးရွားသော သက်ရောက်မှုများလျော့ပါးစေရန် ပုံမှန်စက်ရုံထိန်းသိမ်းခြင်းနှင့် ပြုပြင်ခြင်းဖြင့် ပတ်ဝန်းကျင်လေထုအရည်အသွေးကို ထိန်းသိမ်းရန်နှင့် အလွန်အနံ့ဆိုးထွက်ရှိနိုင်ချေကို တားဆီးရန် အတွက် သင့်လျော်သော ဓာတ်ငွေ့ထုတ်လုပ်မှု/ စွန့်ပစ်ပစ္စည်းများကို အသုံးပြုရန်၊ သင့်လျော်သော စက်ကိရိယာများကို အသုံးပြုရန် စောင့်ကြည့်ခြင်းအစီအစဉ်များကို ထည့်သွင်းစဉ်းစားရန် အကြံပြုထားပါသည်။ အနံ့ထိန်းခြင်းဗျူဟာများသည် ကပ်လျက်နေထိုင်သည့် သို့မဟုတ် လူပတ်ဝန်းကျင်ကို အနှောင့်အယှက်အနည်းဆုံးဖြစ်စေရန်အတွက် လေတိုက်သည့်လမ်းကြောင်းများကို ထည့်သွင်းစဉ်းစားသင့်သည်။

၃။ လုပ်ငန်းလည်ပတ်မှုမှ ထွက်လာသော စွန့်ပစ်ပစ္စည်းများကို ပြန်လည်ကြိတ်ခွဲထားပါသည်။ စက်ရုံ၏ သန့်ရှင်းရေးနှင့်ဝန်ထမ်းများ၏ အိမ်တွင်းအရည်အသွေး(အညစ်အကြေး)များမှလွဲ၍ စိုစွတ်သော အမှိုက်များကို မျှော်မှန်းမထားဘဲ လေထုညစ်ညမ်းမှုနှင့် နောက်ဆက်တွဲဆိုးကျိုးများဖြစ်သော BOD/COD မြင့်မားသော စွန့်ပစ်ရည်များကြောင့် အနီးနားရှိရေကြောများ ပျက်စီးစေခြင်းမှကာကွယ်ရန် အကြံပြုထားပါသည်။

၄။ နိုက်ထရိုဂျင်၏ အရေးပါမှု - ရေနံအစားအစာထုတ်လုပ်မှုတွင် ဖော့စဖိတ်အချိုးအစား၊ အစားအစာနှင့်ရေကြား အပြန်အလှန်အကျိုးသက်ရောက်မှုနှင့် အစာထုတ်လုပ်သူ၏ အလုံးစုံပတ်ဝန်းကျင်ဆိုင်ရာ တာဝန်ယူမှုဖြစ်သော ရေနံအစားအစာထုတ်လုပ်ခြင်းအလေ့အထများအတွက် သက်ဆိုင်ရာနိုင်ငံတကာ စံနှုန်းအတိုင်း လိုက်နာရမည်ဖြစ်ပါသည်။

၅။ အချို့သော အကျိုးခံစားခွင့်များသည် ဆောက်လုပ်ရေးကာလနှင့် လုပ်ငန်းလည်ပတ်မှု အဆင့်နှစ်ခုလုံးတွင် ဒေသဆိုင်ရာအလုပ်အကိုင်နှင့် စီးပွားရေးအခွင့်အလမ်းများအတွက် ရရှိမည်။

၆။ Aqua Feed Mill Factory ၏ အခြေခံအဆောက်အအုံများအားလုံး - ဂိုဒေါင်များ၊ ဆီလို့များ၊ ထုတ်လုပ်မှု တာဝါတိုင်များနှင့် အဆောက်အအုံများသည် ပုံမှန်လည်ပတ်နေချိန်နှင့် မီးလောင်ကျွမ်းမှုများနှင့် ပေါက်ကွဲခြင်းများကို ကာကွယ်ရန် သဘောတရားအန္တရာယ်များကို ရှောင်ရှားရန်အတွက် ဖွဲ့စည်းတည်ဆောက်ပုံဆိုင်ရာ ဒီဇိုင်းဆိုင်ရာနှင့် လုပ်ငန်းလည်ပတ်ဆောင်ရွက်မှုဆိုင်ရာ နိုင်ငံတကာစံနှုန်းများနှင့် ကိုက်ညီသင့်ပါသည်။

၇။ စက်မှုဇုန်ဧရိယာအတွင်း တည်ရှိသည့် စီမံကိန်းနေရာသည် ဖြစ်နိုင်ခြေရှိသော ပြန်လည်နေရာချထားရေးပြဿနာများ မရှိသည့်အပြင် လုပ်ငန်းခွင်သို့ လာရောက်လည်ပတ်စဉ် (မေလမှ ဇွန်လ၊ ၂၀၁၉ ခုနှစ် နှင့် ၂၀၂၁ ခုနှစ် ဒီဇင်ဘာလ) တွင် စီမံကိန်းနေရာ၏ ပရဂျက်အတွင်း လူများအခြေချ နေထိုင်ခြင်း မရှိပေ။ သို့သော်လည်း၊ မြောင်းတဝါစက်မှုဇုန်အပြင်ဘက်လှိုင်းမြစ်အနီးတွင် ရွာနှစ်ရွာရှိပါသည်။ စီမံကိန်းပတ်ဝန်းကျင်များသည် NEQEG၊ 2015 ကို လိုက်နာကြောင်း သေချာစေခြင်းဖြင့် သွယ်ဝိုက်သက်ရောက်မှုရှိနိုင်သော လူများနေထိုင်ရာနေရာကို ကာကွယ်ရန် အစပြုခဲ့ပါသည်။

၈။ ဝန်ထမ်းများအတွက် တင်းကျပ်သော ကျန်းမာရေးနှင့် ဘေးကင်းရေးဆိုင်ရာလုပ်ထုံးလုပ်နည်းများကို အကောင်အထည်ဖော်ခြင်းနှင့် ပိုင်နက်ကျူးလွန်မှုများနှင့် ဖျက်ဆီးမှုတို့ကို တားဆီးရန်အတွက် လုံလောက်သော ကာရံခြင်းနှင့် အခြားနေရာလုံခြုံရေးများတပ်ဆင်ခြင်း စသည့်အစီအမံများဖြင့် လုံခြုံရေးဆိုင်ရာစိုးရိမ်ပူပန်မှုများကို ဆောင်ရွက်ထားရပါမည်။ ထိရောက်သောလုပ်ငန်းစဉ်ဘေးကင်းရေးစီမံခန့်ခွဲမှုသည် မတော်တဆမှုများကို လျော့ချပြီး လူ့ကျန်းမာရေး၊ ပတ်ဝန်းကျင်နှင့် ပိုင်ဆိုင်မှုများအပေါ် ဆိုးကျိုးများကို လျော့ချစေပါမည်။

ဖော်ထုတ်တွေ့ရှိထားသည့် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ထိခိုက်မှုများအားလုံးကို အမျိုးသားပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ(၂၀၁၂)၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ(၂၀၁၄)၊ EIA လုပ်ထုံးလုပ်နည်းအသိပေးချက်(၂၀၁၅)၊ ပတ်ဝန်းကျင်အရည်အသွေး (ထုတ်လုပ်မှု)လမ်းညွှန်ချက်များ(၂၀၁၅) နှင့် အော်ပရေတာများမှ သက်ဆိုင်ရာပြည်တွင်းနှင့် နိုင်ငံတကာဒီဇိုင်းကုဒ်များနှင့် ထိရောက်သော ကျန်းမာရေးနှင့် ဘေးကင်းရေးနှင့် ပတ်ဝန်းကျင် (HSE) မူဝါဒကို လိုက်နာခြင်းဖြင့် လျော့ချစေနိုင်ပါသည်။

ပုံမှန်စစ်ဆေးခြင်းနှင့် စာရင်းစစ်သည် EMP ၏ ထိရောက်မှုကို အထောက်အပံ့ပေးမည်ဖြစ်သည်။ အဆောက်အအုံများကို နိုင်ငံတကာစက်မှုလုပ်ငန်းစီမံကိန်းများနှင့်အညီ စနစ်တကျဒီဇိုင်းထုတ်ကာ လည်ပတ်ဆောင်ရွက်စေခြင်းဖြင့် စီမံကိန်း၏ သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာအန္တရာယ်ကို အဆင့်နိမ့်အဖြစ် အကဲဖြတ်ထားပါသည်။ မီးဘေးအန္တရာယ်၊ ပြင်းထန်သောရာသီဥတု သို့မဟုတ် စီမံကိန်းကို ထိခိုက်နိုင်သော သဘာဝဘေးအန္တရာယ်များ (ဆိုင်ကလုန်း၊ ရေကြီးမှု၊ မီးလောင်ကျွမ်းမှု စသည်) ရှိနေပါသည်။



သို့သော် ယင်းတို့သည် အဆောက်အဦများ၏ အသံအင်ဂျင်နီယာဒီဇိုင်း၊ ပရော်ဖရှင်နယ် ဆောက်လုပ်ရေး နည်းပညာများ၊ ဆောက်လုပ်ရေးနှင့် လုပ်ငန်းလည်ပတ်မှုအဆင့်များအတွင်း ပရောဂျက်အား ကြီးကြပ်ခြင်း နှင့် စောင့်ကြည့်ခြင်းများဖြင့် လျော့ပါးသွားသည်ဟု ယူဆရသည်။ ထိရောက်သော လုပ်ငန်းစဉ် ဘေးကင်းရေးစီမံခန့်ခွဲမှုသည် မတော်တဆမှုများကို လျော့ချပြီး လူ့ကျန်းမာရေး၊ ပတ်ဝန်းကျင်နှင့် ပိုင်ဆိုင်မှု များအပေါ် မတော်တဆထိခိုက်မှုများ၏ ဆိုးကျိုးများကို လျော့ချသင့်သည်။

## ESIA (Environmental and Social Impact Assessment)

### On Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

## 2. Introduction

The [FAO](#) (Food & Agriculture Organization of the United Nations) reports that global aquaculture continues to grow. The Aqua Feed culture today supplies more than half of all fish for human consumption, and global fish consumption per capita more than doubled over the last 50 years. It, therefore, comes as no surprise that aquatic feeds became the fastest growing feed sector when compared to other animal feeds and pet food, and is currently growing at approximately 7% per year.

The ultimate goal of aqua feed culture is:

- 1) to produce healthy edible protein;
- 2) to produce edible protein at the lowest possible cost per kilogram<sup>21</sup> with negligible effect on the environment

The environmental and social impact assessment report (ESIA) is being conducted by NEPS Co., Ltd. of Myanmar. The study examines the environmental and social context of the proposed site and then identifies potential impacts on physical environment, socio-economic, cultural heritage and ecological issues based on the activities associated with Aqua Feed Mill Factory Project at Myaung Dagar Industrial Zone, Hmawbi Township of Yangon Region to be implemented by De Heus Myanmar Co. Ltd.

### 2.1 Presentation of the Project Proponent

Aqua Feed Mill Factory Project is being implemented by De Heus Myanmar Ltd., a member of the De Heus Nutrition founded in 1911, which has its roots in the Netherlands. After more than 100 years the company is still owned and managed by the De Heus family and is a partner to the Agricultural Sector for over four generations, extending its professional expertise to various parts of the world, of which Myanmar is one of them. De Heus has grown into an international leading producer and exporté of complete ranges of feeds, concentrates and premixes regarding animal nutrition, including feed for chicken, duck and quail, swine and others (dairy cattle and aqua)<sup>22</sup>

#### 2.1.1 Project Proponent : De Heus Myanmar Limited

Investor for De Heus Myanmar : Mr. Koenraad Jacob De heus

Managing Director : Mr. Jacobus Johannes De Heus

#### 2.1.2 Contact Person : (a) Daw Khin Mi Mi Zin, QA Manager,

Email: [Kimmy.Zin@deheus.com](mailto:Kimmy.Zin@deheus.com)

(b) Daw Wah Wah Kyaw (Scarlet), Sr. QA Officer,

Email: [Scarlet.Kyaw@deheus.com](mailto:Scarlet.Kyaw@deheus.com)

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<sup>21</sup> FCR (Feed Conversion Ratio) and SGR (Specific Growth Rates) are therefore key performance indicators of manufactured aquatic feed and indirectly the technology used to produce them

<sup>22</sup> [www.deheus.com](http://www.deheus.com)

**2.1.3. Contact Numbers** : 09-251848375, 09-797023477, 09-781453123

**2.1.4 Project Location**

Main Office Address : 12/L, Pyae Nyein Thu Condo, Penthouse 6<sup>th</sup> Floor, Pyi Thu Street, 7 Mile, Mayangone Township, Yangon.

Project Site Address : Plot No. 309, 310, 311 Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region.

**2.1.5 Land Acquisition**

The Project Site is 5.51 acres (22,298 m<sup>2</sup>) leased at a rate of 28 USD per square meter, with a total rent of 624,344 USD per annum from U Aung Shwe Tun for the Plot No. 309,310, 311 Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region<sup>23</sup>.

**2.1.6 Project Size**

Size of Project is Medium and it is defined upon the following factors;

Duration	50 Years
Planned Project staff	70 staff
Investment Capital	14.726 Million US Dollars
Leased Land Size / Rent	5.51 acres (22298 sq. meter @ 28. USD per sq. meter), Total rent of 624344. USD per annum (50 years grant for 5.51 acres of project site);
Lessor Name	U Aung Shwe Tun <sup>24</sup>

**2.1.7 Project Aim**

The main objective is to improve a wide range of aqua feed products in their quality and effectiveness to fulfil the requirements of the Fishery Industry of Myanmar with international standardized fish feed in accordance to the Myanmar Companies Law 2017.

The project proponent has established animal feed projects during the past seven years in Myanmar and now an aqua feed mill factory is proposed to fulfill the dire need for nourishing and safe healthy food for today's Aqua culture in Myanmar. The project proponent has constructed an aqua feed mill factory adjacent to its existing animal (livestock) feed mill factory premises at Plot No. 309, 310, 311 Myaung Dagar Industrial Zone, Hmawbi Township of Yangon Region.

**2.2 Presentation of Third Party Organization**

National Engineering & Planning Services (NEPS) is a company incorporated in Myanmar in 1998 specializing in Planning, Design, Construction and Engineering Consultancy Services related to civil engineering works. It has the resources and experience essential for the successful completion of the tasks. NEPS has more than 40 engineers and specialists of various disciplines including geology,

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<sup>23</sup> Appendix C: Land Lease Agreement Aqua Feed Mill Project Area

<sup>24</sup> Appendix C2: "Aqua Feed Mill Factory Land Acquisition Document Extract"

geo- technology, agronomy, hydraulics, hydrology, environmental engineering, geometrics engineering, social economics and remote sensing subjects.

Among the above specialists, 15 key personnel of NEPS have work-experience of more than 30 years and had proven expertise having post graduate trainings in overseas institutes. For flora, terrestrial fauna and aquatic fauna study, some specialists (Retired Professors and Lecturers from the Universities) are affiliated with NEPS to cope with the diversified nature of EIA works. Among other works, NEPS has successfully carried out the environmental works such as a) Environmental and Social Impact Assessment (ESIA), b) Initial Environmental Examination (IEE) and c) Environmental Management Plans (EMP) and other related assignments.

More information about NEPS is available on the website: [www.neps-myanmarengineering.com](http://www.neps-myanmarengineering.com)

### **2.2.1 Identification of Environmental and Social Experts from third party NEPS**

***Table 2.1 ESIA Report Preparers***

Members of ESIA preparation				
Team Leader of the team				
Name (Sur name, Given name)	Registration / License No. by ECD	Organization	Contact Detail	Area of expertise
U Aye Myint	0035	NEPS	01 8562407	Team Leader, ESIA Team, NEPS. Senior Water Resource Engineer, Overall Supervision of ESIA Works, Consultant for Policy and Legal matters.
Member of the team (except the team leader)				
Name (Sur name, Given name)	Registration / License No. by ECD (if registered)	Organization	Contact Detail	Area of expertise
Dr. Khin Maung Swe	0035	NEPS	01 8562407	Biodiversity Expert: Head of Flora and Fauna Survey Team
U Kyaw Win	0035	NEPS	01 8562407	Health Assessment Expert, Waste Management, Risk Analysis along supply chains
U Aye Ko	0035	NEPS	01 8562407	Senior Geologist, Engineering Geology, Geomorphology, Geological formation analysis
U Nyo	0035	NEPS	01 8562407	Soil and Agronomic Expert, Soil and Water Quality Analyses, Socio Economic Survey, Stakeholder Meeting
Daw Khin Khin Cho	0035	NEPS	01 8562407	Senior Engineer Hydrologist, Water Resources Engineer, Climate Change Analysis

Daw Phyu Phyu Aye	0035	NEPS	01 8562407	Senior Engineer Environmentalist, Risk Assessment and Hazard Management, Waste Management
Daw Myat Mon Swe	0035	NEPS	01 8562407	Hazard identification Expert, Pollution Control, Public Consultation Meeting,
Daw Haymar Hnin	0035	NEPS	01 8562407	Engineer Environmentalist, Socio Economic Surveyor, Discussion and explanation of public consultation meeting
Daw Aye Thet Wai	0035	NEPS	01 8562407	GIS Specialist, Maps, Photographs, Satellite Images, Aerial Photographs, Topography condition
Daw Esther Ro Hniang	0035	NEPS	01 8562407	Water Resources Engineer, Environmentalist, Ecology and Biosecurity, Risk Assessment and Hazard Management
Daw May Thinzar Soe	0035	NEPS	01 8562407	Engineer Environmentalist, Socio Economic Surveyor, Risk Assessment and Hazard Management
Daw Khin Thuzar Myint	0035	NEPS	01 8562407	Environmentalist, Socio Economic Surveyor, Stakeholders Meeting
Daw Tin Nwe Nwe Oo	0035	NEPS	01 8562407	Community Development, Socio Economic Surveyor, Stakeholders Meeting
Daw Oo Oo Thu	0035	NEPS	01 8562407	Community Development, Socio Economic Surveyor, Stakeholders Meeting
U Kyaw Zin Tun	0035	NEPS	01 8562407	Community Development, Socio economic surveyor, Stakeholders Meeting
U Akkar	0035	NEPS	01 8562407	Soil and water sampling, Noise and air pollution analysis, socio economic surveyor.

### **2.3 Presentation of Health Expert for Project with Summary Health Impact Assessment**

**U Kyaw Win:** Health Assessment Expert, NEPS has served as a Public Health Engineer since graduation in Civil Engineering and with further studies at the Delft Institute of Technology in the Netherlands for Sanitary Engineering expertise (for one year); had acquired relevant certificate of full attendance and accomplishment in his profession as a Public Health Engineer. Furthermore, he has

various post- graduate Diplomas in Biotechnonology and Management Administration from the Yangon Institute of Technology and the University of Rangoon respectively.

During his younger days, he had served in the government services as a Public Health Engineer and Consultant from the Government Side in various Human Development (HDI) projects such as the CWSS (Community Water Supply and Sanitation), and other Environmental projects in coloboration with WHO, UNDP, UNICEF, UN (Habitat) and has retired as a Deputy Director of the Environmental Sanitation Division in the Department of Health, Naypyidaw.

During Dec 2021, U Kyaw Win, accompanied by other Environmental Engineers of NEPS, carried out a Health Impact Assessment (HIA) of Aqua Feed Mill Factory Project at Myaung Dagar Industrial Zone, Hmawbi Township. The summary notes of the HIA carried out by the NEPS Team is described as follows<sup>25</sup>:

### **Occupational Health Hazards**

(Reference – Appendix F: Environmental Health Impact Assessment Report on Aqua Feed Mill Factory Project, De Heus Myanmar Limited. by (Kyaw Win) Public Health Engineer.

### **Assessment and Findings**

Our observatory findings and reference to the Environmental Quality Monitoring Report on De Heus Myanmar Ltd., by Hexagonal Angel International Consulting Co., Ltd<sup>26</sup>., (during Nov 2021), this report is made and interpreted as follows:

**Location:** 17°9'25.9"N and 95°58'7.89"E: Average air velocity (24 hrs) = 0.48 m/s

**Gaseous Emissions:** Toxic gaseous emission from process, depending on type of raw materials being used in the process. In this factory, there are some toxic gases SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>x</sub> particulates. Some gases are higher than TLV (Threshold Limit Value). They are SO<sub>2</sub> = 118.84 µg/m<sup>3</sup> where TLV = 20 µg/m<sup>3</sup> at 24 hr. NO<sub>2</sub> = 42.58 µg/m<sup>3</sup> where TLV = 40 µg/m<sup>3</sup> in one year. Even CO and O<sub>3</sub> are detected. Physicological action of gases and vapours may affect human health, particularly the workers and nearby community. CO<sub>2</sub> and NO<sub>2</sub> would cause oxygen deficiency in air, lungs and blood. SO<sub>2</sub> irritates lower trachema and brochina. O<sub>3</sub> also irritates bronchides and alveolar sacs. That is why air pollution contributes significantly as a cause of aggravating factor for medical conditions such as acute respiratory infections, chronic bronchitis, chronic construction ventilation diseases, pulmonary emphysema, bronchial asthma and lung cancer (H. Meimann).

**Light and Ventilation:** Each floor of the factory has been installed with 70 ceiling electric bulbs and fluroscent lamps. Light is enough for working because lighting intensity specified is 5 watt / ft<sup>2</sup> in workplace. According to direct observation, not much enhhaust and exhaust fans are there. They rely on air conditioning system for ventilation. Besides, they want to control humidity by this system. Actually, almost 10 ft of fresh air / person / min is required.

**Heat and Humidity:** Air temperature (24 hr) is 20.75°C and relative humidity (24 hr) is 7.85% in the

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<sup>25</sup> Appendix F: HIA (Health Impact Assessment) Report on Aqua Feed Mill Factory Project, Hmawbi TS

<sup>26</sup> Appendix G: Environmental Quality Monitoring Report on De Heus Myanmar Ltd., Nov 2021

working area. They keep daily temperature and humidity records in the room.

**Noise Pollution:** Unwanted sound is defined as noise which is a pollution of the environment. It can affect the human beings and animals too. While visiting the factory, noise is not felt. Probably, it is a maintenance day and only a few forklift machines and operators are working by then. At the industrial area, sound level is standardized 70 dBA by NEQG but average dBA of the factory in 24 hr is 66.19 dBA. Though, sound pressure level (SPL) is not known.  $SPL = 0.002 \mu\text{bar}$  is the TLV for human beings. It is learnt that at 90 dBA for eight days for 45 years, about 10% of the workers exposed will suffer a 10% hearing impairment.

**Burn Accidents:** It was seen that hot water supply pipes were being covered with heat insulating materials and fire extinguishers are already standby in position. This is a good practice example.

**Sanitation:** Toilet facilities are sufficient for the present workers though they are away from working area. For water supply, water quality testing results show not bad.

**Conclusion for HIA:** This type of factory is necessary for our country, which is based on agriculture and livestock husbandry economic one. Only when fish and livestock gain nutritious food, men eating this kind of fish and livestock will grow and develop as the strong and healthy nation; who may become effective productive force for our country. But in future, a well plan of GMP for increased worker population is needed to prepare. At present, it was seen esthetically neat and tidy factory and odour is not felt, surprisingly. Solid wastes are collected by township municipality daily. Formally, this area had been a bamboo-forest (Myaung Dagar) village and now has become a part of Hmawby Township.

### 3. Policy, Legal Framework and Environmental Legislation

Background information of legal aspects on environmental conservation in Myanmar relating to Aqua Feed Manufacturing is found in National Law for Environmental Conservation, enacted in 2012, Foreign Investment Law (2016) and also reference to international guidelines such as a) IFC: “Environmental, Health and Safety Guidelines for Aqua culture”, b) CODEX Alimentarius (FAO/WHO): “Code of Practice for fish and fishery products”, c) ICUN, “Sustainability of Fish Feed in Aquaculture”, etc.

**Feed supply Feeds** used in aquaculture production should comply with the Code of Practice on good animal feeding (CAC/RCP 54-2004).

The following section provides an extracted section concerning regulatory requirements that will be applicable to the Project and national guidelines that are of relevance to the proposed Project.

#### 3.1 Corporate environmental and social policies

The De Heus Myanmar Limited (Project Proponent) will develop an Environmental Policy which includes the company’s commitments to health, safety and environment. This Policy is now preparing.

##### 3.1.1 Policies

Myanmar has developed Goals and Policies to uplift the country’s economy in all aspects. The relevant policies are described in Table 0-1 and the Project Proponent commits to support to meet these goals.

*Table 0-1 Myanmar Relevant Policies*

Policies	Descriptions
The National Environment Policy, 2019	<p>As per Clause 7 in this Policy, there builds on Myanmar’s 1994 National Environmental Policy and reaffirms its core values:</p> <ul style="list-style-type: none"><li>• The wealth of the nation is its people, its cultural heritage, its environment and its natural resources.</li><li>• It is the responsibility of the State and every citizen to preserve our natural resources in the interests of present and future generations.</li><li>• Environmental protection should always be the primary objective in seeking development.</li></ul> <p>In order to meet the visions, the Government of the Republic of the Union of Myanmar adopts the following 23 National Environmental Policy principles as the guiding framework for achieving: a clean environment and healthy, functioning ecosystems; sustainable economic and social development; and the mainstreaming of environmental protection and management:</p> <p><i>The project proponent wishing to implement the project to align with this policy and comply the rules and regulations in order to support this.</i></p>
Myanmar Climate Change Policy, 2019	<p>This is established with the vision to be a climate-resilient, low carbon society that is sustainable, prosperous and inclusive, for the wellbeing of present and future generations.</p> <p>In Clause 12, there clearly set-up a guiding principle for</p> <ul style="list-style-type: none"><li>• Sustainable development</li><li>• Precaution</li><li>• Prevention</li><li>• Environmental integrity</li></ul>



Policies	Descriptions
	<ul style="list-style-type: none"> <li>• Shared responsibility and cooperation</li> <li>• Inclusiveness</li> <li>• Good governance</li> <li>• Climate justice and equity</li> <li>• Gender equality and women's empowerment</li> </ul> <p><i>The project proponent commits to support the Government in order to meet the above-mentioned principles</i></p>
The Constitution of the Republic of the Union of Myanmar, 2008	<p>The Constitution of the Union of Myanmar is the supreme law of the country and has provisions regarding the protection of the environment in Myanmar.</p> <p><i>The Project Proponent commits to comply as these three Articles in the Constitution provide a basis for legalising and institutionalising environmental health impact assessment and social impact assessment.</i></p> <p>There stipulates that:</p> <ul style="list-style-type: none"> <li>• The Union is the ultimate owner of all lands and all natural resources above and below the ground, above and beneath the water and in the atmosphere in the Union; The Union shall enact necessary law to supervise extraction and utilization of State owned natural resources by economics forces (Article 37 (a,b));</li> <li>• The Union shall protect and conserve natural environment (Article 45).</li> <li>• Every citizen has the duty to assist the Union in carrying out the following matters: <ul style="list-style-type: none"> <li>▪ preservation and safeguarding of cultural heritage.</li> <li>▪ environmental conservation.</li> <li>▪ striving for development of human resources.</li> <li>▪ protection and preservation of public property (Article 390).</li> </ul> </li> </ul>

### 3.2 Myanmar Legal Framework

Environmental legislation and arrangements for environmental conservation in Myanmar are developing rapidly. The laws governing for environmental conservation, impact assessment, procedures and relevant section have been explored in section 3.2.1 and section 3.2.2. The Project Proponent will comply all the rules and regulations that have been prescribed in Myanmar with good practices.

#### 3.2.1 Myanmar Legislation Relevant to the Project

Laws related to environmental and social issues and hence relevant to the EIA Study for the proposed Project are included in Table 0-2.

***Table 0-2 Myanmar Legislation and Relevance to Project***

Laws and Regulations	Description
<b>Compliance for Environment</b>	
<i>The Environmental Conservation Law, 2012</i>	
<ul style="list-style-type: none"> <li>▪ Section 7(O) states that the Ministry can manage a proponent to provide compensation for environmental impact and contribute funds.</li> <li>▪ Section 14 states for the requirement of emissions to the environment to meet stipulated environmental quality standards.</li> <li>▪ Section 15 states for the requirement of proponent to provide onsite controlling equipment to</li> </ul>	

Laws and Regulations	Description
	<p>monitor, control, manage, reduce or eliminate pollutants, or if impracticable, arrange environmentally-sound disposal.</p> <ul style="list-style-type: none"> <li>▪ Section 23&amp;24 mentions the need for prior permission from the Ministry for the business that have been categorized for causing impact on the environmental quality and right to issuing permit with terms and conditions relating to environmental conservation after scrutinizing.</li> <li>▪ Section 29 provides that the proponent shall not violate any prohibition contained in the rules, notifications, orders, directives and procedures under the Environmental Conservation Law.</li> </ul>
	<i>The Environmental Conservation Rules, 2014</i>
	<p>The Ministry of Natural Resources and Environmental Conservation, in exercise of power conferred under sub-section (a) of section 42 of the Environmental Conservation Law, issues this rule by No. 50 of 2014 on the date of 5 June 2014.</p>
Section 56	<p>The person who carries out any project, business or activity shall arrange and carry out for conducting the environmental impact assessment for any project, business or activity by a qualified third person or organization accepted by the Ministry.</p>
Section 69	<p>Any person shall not emit, cause to emit, dispose, cause to dispose, pile and cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place which may affect the public directly or indirectly.</p> <p>Any person shall not carry out to damage the ecosystem and the natural environment, which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people.</p>
	<i>EIA Procedure (2015)</i>
	<p>The EIA Procedure sets out the procedures for completing an IEE, EIA and/or EMP in Myanmar. This includes information on project categorisation, responsibilities of project developers and ministries, EIA review, monitoring and auditing, among other issues.</p>
	<p>Section 102 to 105, there prescribed responsibility for adverse impacts, that</p>
	<ul style="list-style-type: none"> <li>▪ The proponent has to bear full legal and financial responsibility for actions and omissions and those of other related to the project proponents.</li> <li>▪ That proponent has responsible to support programs for livelihood restoration and resettlement in consultation with all stakeholders.</li> <li>▪ And the proponent has full responsibility to implement the EMP, the requirements set forth in ECC, Project commitments and conditions when providing services to the Project and inform the Ministry with detailed information as to the propose project's potential adverse impacts.</li> </ul>
	<p>Section 106 to 110, regarding for the monitoring, the project proponent has responsible to undertake comprehensive self-monitoring</p>
	<ul style="list-style-type: none"> <li>▪ to notify and identify in writing to the Ministry for any breaches of its obligations or other performance failures or violations of the ECC and EMP</li> <li>▪ to submit monitoring reports to the Ministry</li> <li>▪ to submit the monitoring report within ten (10) days of completing a monitoring report and the information to be included.</li> </ul>
	<p>Section 113,115, 117, there stipulated, for the purposes of monitoring and inspection, the event of emergency, the proponent has the responsibilities to</p>
	<ul style="list-style-type: none"> <li>▪ grant the ministry and/or its representatives.</li> <li>▪ grant the Ministry access to any places relating to project activities;</li> </ul>
	<i>National Environmental Quality (Emissions) Guidelines (2015)</i>
	<p>The NEQ guidelines set out emission standards for air, noise and effluent discharges for oil and gas terminal operations. The project shall consider emissions standards in its environment impact assessment and environmental management plan.</p>
<b>Compliance for Industrial Development</b>	

Laws and Regulations	Description
	<i>Myanmar Investment Law, 2016, The Pyidaungsu Hluttaw Law No. 40/2016</i>
	<ul style="list-style-type: none"> <li>▪ Section (50)(d), it is stipulated that the investor have to register the land lease contract at the office of Registry of Deeds in accordance with the Registration Act.</li> <li>▪ Section (51), it is mentioned for appointment, replacement, providing for the employment of staff and workers, ensuring to comply the entitlements and rights in the labor laws and rules, settling dispute regarding HR issues.</li> <li>▪ Section (65), regarding for responsibilities of investors, it is prescribed as that the investor has to <ul style="list-style-type: none"> <li>▪ respect and comply with the customs, traditions and traditional culture of the ethnic groups in the Union (a).</li> <li>▪ inform to the Commission if it is found that natural mineral resources or antique objects and treasure trove are not related to the investment permitted(e).</li> <li>▪ not make any significant alteration of topography or elevation of the land on which is entitled to lease or to use, without the approval of the Commission(f).</li> <li>▪ abide by applicable laws, rules, procedures and best standards practiced internationally for investment(g).</li> <li>▪ list and keep proper records of books of account and financial statement(h).</li> <li>▪ pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directive and so forth during the period of suspension of investment for a credible reason(j).</li> <li>▪ shall pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease and death due to the work(k).</li> <li>▪ supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar(l).</li> <li>▪ respect and comply with the labor laws(m).</li> <li>▪ have the right to sue and to be sued in accordance with the laws(n).</li> <li>▪ allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment(p).</li> <li>▪ take in advance permit or endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission (q).</li> </ul> </li> </ul>
	<i>Myanmar Investment Rules, Notification no. 35/2017</i>
	<ul style="list-style-type: none"> <li>▪ Section 202 stated that the investor shall comply with all terms and conditions in the permit and other applicable laws when the investment is carried out.</li> <li>▪ Section 206 stated that if the investor desires to appoint expert foreigner as senior manager, technical and operational expert or advisor according to subsection (a) of the section 51 of the Law, he shall submit the application attached with passport, expertise evidence or degree certificate and summary of biography of such foreigner to the Commission and obtain the approval.</li> </ul>
	<i>The Import and Export Law, 2012</i>
	<ul style="list-style-type: none"> <li>▪ Section 7, states that a person who obtained any license shall not violate the conditions contained in the license.</li> </ul>
	<i>Myanmar YCDC Law 2018</i>
	It has stated that the committee has the right to:
	<ul style="list-style-type: none"> <li>▪ To corporate for the inspection with the concerning authority and</li> </ul>

Laws and Regulations	Description
	<ul style="list-style-type: none"> <li>▪ To stipulate orders for the carriage, storage of chemical and related substances for not harming to public health and life</li> <li>▪ To manage the waste regarding for the hazardous.</li> </ul> <p>There it has been prohibited for disposing chemical and its related substances in areas, which are not being allowed in the City Development area and mentioned offenses and penalties.</p> <ul style="list-style-type: none"> <li>▪ The Project Proponent commits to comply the stipulations and undertake the necessary proceeding as per this law and notification issued by the committee.</li> </ul>
	<i>Factory Act, 1951</i>
	<ul style="list-style-type: none"> <li>• Section 52 states that Where the President is of opinion that any operation carried on in a factory is likely to expose any person employed therein to risk of bodily injury, poisoning or disease, he may make rules applicable to any factory or class of factories in which the operation is carried on- <ul style="list-style-type: none"> <li>• (a) Specifying the operation and declaring it to be dangerous;</li> <li>• (b) Prohibiting or restricting the employment of women , adolescents or children in the operation;</li> <li>• (c) Providing for the periodical medical examination of persons employed or applying to be employed in the operation and prohibiting the employment of persons not certified as fit for such employment;</li> <li>• (d) Providing for the protection of all persons employed in the operation or in its vice and</li> <li>• (e) Prohibiting restricting or controlling the use of any specified materials, or process in connection with the operation.</li> </ul> </li> </ul>
	<i>The Law on Standardization (2014)</i>
	<p>This is for the reducing the technological barriers for the trade and supportive for the development international free trade zone and for the development of Myanmar economy and social, the standardization will utilize for the smoothness of technology transfer and invention. There it empowers to organize the council for setting up the policy, guideline and to implement to practice the national standard in respective production and service.</p>
	<b>Compliance for Safety</b>
	<i>Industrial Use Explosive Substance Law (17/2018)</i>
	<p>The Project Proponent commits not to import, transport, store, make, use, hold, transfer the industrial explosive substances without any approval in accordance with the prohibition (section 19(a)).</p>
	<i>Explosive Substances Act (1908)</i>
	<p>The Project Proponent commits to comply and acknowledges the stipulations (section 4):</p> <ul style="list-style-type: none"> <li>• For any person who unlawfully and maliciously causes, by any explosive substance, an explosion of a nature likely to endanger life or to cause serious injury to property, whether any injury to person or property has been actually caused or not, to be punished with transportation for life or any shorter term, to which a fine may be added, or with imprisonment for a term which may extend ten years, to which a fine may be added.</li> </ul>
	<i>Prevention from Danger of Hazardous Chemical and Associated Material Law (Pyidaungsu Hluttaw Law No 28/2013)</i>
	<ul style="list-style-type: none"> <li>▪ Chapter 7 – “Any person, who wants to do the business of chemical and associated materials, shall apply to the central body for the acquisition of the license, attached with the management plan for the environmental conservation in accord with the stipulations”.</li> <li>▪ Chapter 8 – “20. License holder shall apply to the central supervising body in accord with the stipulation for the relevant chemicals and associated materials using for his chemicals and associated materials businesses for a certificate.</li> <li>▪ “22. The registered certificate holder shall abide by the regulations contained in the registered certificate and shall follow the order and directives issued from time to time by the central supervising body”.</li> </ul>

Laws and Regulations	Description
	<ul style="list-style-type: none"> <li>Section 15 states that a) before works, license holder shall be inspected by the relevant supervising and inspection team for safety and machinery/equipment check and b) The persons who are discharging the duty shall be asked to attend foreign training or preventative trainings conducted by government departments and organisations.</li> <li>Section 16 provides that licence holders shall a) follow the licence regulations, b) follow directives on safe handling and shall ask workers to strictly follow c) shall provide necessary safety equipment and issue free personal protective equipment to workers, d) provide training in occupational safety e) determine the hazard to the environment, people and animals f) provide fit for work medical check-up and keep records g) send permission letter to Department of Township Administration if the chemicals and associated material are permitted to store h) acquire in advance guidance and agreement from fire service department if using inflammable materials or explosives i) transport only the permitted amount of chemicals in accordance with prescriptive stipulations j) obtain approval of central supervising body if transporting chemical and associated material from the permitted region to any other region h) abide and operate in accordance with related environmental laws to avoid impacts and damage to the environment.</li> <li>Section 17 states the licence holder must have insurance in accordance with stipulations in case of compensation is required for losses related to people, animals and environment.</li> <li>Section 23 states the registered certificate holder shall apply again for using chemical which are not in the registered list.</li> </ul> <p>Section 27 states the license holder shall a) classify the hazard level of chemicals and related substances in advance b) show Material Safety Data Sheet and warning signage c) provide safety equipment, personal protective equipment and training on their use d) possess, transport, store, use and discharge chemicals and related materials in accordance with stipulations, e) not import or export chemicals and related materials banned by the central supervising board.</p>
	<p><i>Myanmar Fire Force Law, 2015</i></p> <p>The relevant government department or organization shall obtain the opinion of the Fire Services Department for the purpose of fire precaution and prevention, when laying down plans for construction for town, village and downtown or village development plans.</p> <p>According to Section 25: The factory, workshop, highway bus, airport, jetty, hotel, motel, guest house, collective-owned building, market, worksite or business exposed to fire hazard of the owner or manager shall;</p> <p>(a) Not fail to form the reserve fire brigade</p> <ul style="list-style-type: none"> <li>Not fail to provide materials and apparatuses for fire safety; in conformity with the directive of the Fire Services Department</li> </ul>
	<p><i>Myanmar Insurance Law (1993)</i></p> <p>The Myanmar Insurance is established under this Law as a legal entity having perpetual succession, capable of suing and being sued in its own name. The rules for establishing insurances in the country are established.</p> <ul style="list-style-type: none"> <li>Section 15 states it is compulsory for owners of motor vehicles to have Third Party Liability Insurance with Myanma Insurance</li> <li>Section 16 states it is compulsory for organisations operating as an enterprise which may cause damage to life and property of the public or may pollute the environment to have General Liability Insurance with the Myanma Insurance.</li> </ul>
	<p><i>Motor Vehicle Law (2015)</i></p> <p>This is for reducing environmental pollution caused by motor vehicles and the Department has the right to issue directives, the standards, guidelines for the purposes of importing, manufacturing, assembling, maintaining to be safe in accident and environment conservation.</p>
<b>Compliance concerning for Health</b>	
	<p><i>Public Health Law, 1972</i></p> <p>The project owner will cooperate with the authorized person or organization in line with the section</p>

Laws and Regulations	Description
	<p>3 and 5 of said law.</p> <ul style="list-style-type: none"> <li>• Section 3: The project owner will abide by any instruction or stipulation for public health.</li> <li>• Section 5: The project owner will accept any inspection, anytime, anywhere if it is needed.</li> </ul>
	<i>The Protection and Prevention of Communicable Disease Law, 1995</i>
	<ul style="list-style-type: none"> <li>• Section 3 of Chapter 2 states that the Department of Health will carry out immunisations and health education activities related to communicable diseases</li> <li>• Section 4 of Chapter 2 states that the Department of Health will carry out immunisation or other measures in the event of a Principal Epidemic Disease or a Notifiable Disease occurs, and the public will abide by the measures.</li> <li>• Section 9 of Chapter 5 of this law states that all persons are responsible for reporting an outbreak of a communicable disease to the nearest Health Officer.</li> <li>• Section 11 of Chapter 6 states that Health Officer may undertake investigations and medical examinations to prevent the control the spread of Principal Epidemic Disease.</li> </ul>
	<i>The Control of Smoking and Consumption of Tobacco Product Law, 2006</i>
	<ul style="list-style-type: none"> <li>▪ Chapter (6), Section (9), states that the person-charge has to keep the caption and mark referring that it is a non-smoking area, arrange the specific place where smoking is allowed and keep the caption and mark also referring that it is a specific place where smoking is allowed, supervise and carry out measures so that no one shall smoke at the non-smoking area and accept the inspection when the supervisory body comes to the place for which he is responsible.</li> </ul>
	<i>Occupational Safety and Health, 2019 (not come into force yet)</i>
	The Project Proponent commits to comply for:
	<ul style="list-style-type: none"> <li>• Responsibilities of the employers and the employee</li> <li>• Responsibilities of the manufacturer, traders, installation or deployment, and construction and demolition Information/Notice, investigation and reporting</li> </ul>
<b>Compliance for Cultural Heritage</b>	
	<i>The Protection and Preservation of Ancient Monuments Law (2015)</i>
	<ul style="list-style-type: none"> <li>▪ Section 12 states that a person who finds an ancient monument over one hundred years old under the water or above ground shall promptly inform the relevant Ward or Village-Tract Administrative Office.</li> <li>▪ Section 13 states a procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation.</li> <li>▪ Section 20 states no one shall damage ancient monuments including using machinery which causes vibration and discharging chemical substance.</li> </ul>
	<i>The Protection and Preservation of Antique Objects Law (2015)</i>
	<ul style="list-style-type: none"> <li>▪ Section 12 states that for person who finds any object, which has no owner or custodian, needs to inform the relevant Ward or village-tract administrator if he knows or it seems reasonable to assume that the said object is an antique object.</li> <li>▪ Section 13 states that for a procedure to inform and the responsibility to inspect whether it is a real ancient monument or not and keep or cause to protect as may be necessary in accordance with the stipulation</li> </ul>
<b>Compliance for Conservation of Water Resources</b>	
	<i>Conservation of Water Resources and Rivers Law (2006)</i>
	In Section (11)(a), (19), it outlines prohibitions for the following activities:
	<ul style="list-style-type: none"> <li>▪ No person shall dispose of engine oil, chemical, poisonous material and other materials which may cause environmental damage or dispose of explosives from the bank or from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk.</li> <li>▪ No one shall dispose of any substance into the river creek that may cause damage to</li> </ul>



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	<p>waterway or change of watercourse from the bank or vessel.”</p> <p>The empowerment of this Law is provided to the Ministry of Transport for controlling navigation of vessels in the rivers and creeks as well as communicating with local and foreign government and organizations for conservation of water resources, rivers and creeks. Also, to carry out conservation works for water resources, rivers and creeks, in accordance with the relevant international conventions, regional agreements and bilateral agreements for environmental conservation.</p>
	<i>Underground Water Act, 1930</i>
	<p>The underground water act enacted on the date of 21<sup>st</sup> June in 1930 whereas it is expedient to conserve and protect underground sources of water supply in the Union of Myanmar. This act prohibits sinking of a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer. Township Officer or sub-divisional officer had power to close a license tube after exercising jurisdiction over the local area concerned and the expense of such closure shall be recoverable from the owner of the tube as if it were an arrear of land-revenue.</p>
<b>Compliance for social safeguard</b>	
	<i>The Land Acquisition Act (1894)</i>
	<p>Preliminary Investigation.</p> <p>Section. 4 (1) states that whenever it appears to the President of the Union that land in any locality is needed or is likely to be needed for any public purpose, a notification to that effect, shall be published in the Gazette, and the Collector shall cause public notice of the substance of such notification to be given at convenient places in the said locality.</p>
	<i>The Land Acquisition, resettlement and restoration (2019)</i>
	<p>Enacted to implement to acquire the land for the interest of public based upon the approved National Land Use policy and to protect the environmental and social impacts arising from the land acquisitions. The enforcement date is not confirmed yet. As soon as this law is enforced, the land Acquisition Act (1894) is repealed.</p>
	<i>The Farmland Act 2012</i>
	<p>Section 30, states that it can apply to utilize the farmland for other purpose in the public interest; the central farmland management body and respective region or state government (except paddy land).</p>
	<i>Vacant, Fallow and Virgin Land Management Act 2012, (Pyidaungsu Hluttaw Law No.10 of 2012)</i>
	<ul style="list-style-type: none"> <li>▪ Section 16, states that Person who is granted the right to use the vacant, fallow and virgin lands has to comply the conditions: <ul style="list-style-type: none"> <li>• Land granted will use for the purpose granted and in relation to economic enterprise.</li> <li>• To carry out to be completed within four years from the date of grant according to the purpose granted (can revise by the Central Committee for losing time due to natural disaster and unstable security conditions.</li> <li>• Not to mortgaged, giving, sold, leasing or otherwise transferred or divided without the permission of the Cabinet of the Union Government.</li> <li>• To fully pay the land revenue.</li> <li>• To comply the conditions prescribed by the Central Committee</li> <li>• Prohibit to explore other natural resources below and above ground except the purpose granted.</li> <li>• To surrender the natural resources found in the authorized land and the Government being desirous of extracting the same on a commercial resume the area required therefrom.</li> </ul> </li> <li>▪ Section 19, states that The Central Committee shall resume the area required in the authorized land, if one of the following situations arises: - <ul style="list-style-type: none"> <li>• If ancient culture heritage is found in the authorized land.</li> </ul> </li> </ul>



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	<ul style="list-style-type: none"> <li>• If infrastructure project or Special project are desired to be constructed on the authorized land, in the interest of the State.</li> <li>• Except the permitted minerals, if other natural resources are found in the authorized land which are permitted for production of mining.</li> </ul>
<b>Compliance for Social Security</b>	
<i>Employment and Skill Development Law, 2013</i>	
5. (a) (1) If the employer has appointed the employee to work for an employment, the employment agreement shall be made within 30 days. But it shall not be related with government department and organization for a permanent employment.	
15. The Project Proponent	
(a) shall carry out the training for each work or compounding the work individually or group-wise by opening on-job training, training systematically at worksite, sending outside training and training by using information technology system, for arranging the training program to enhance the employment skill of the workers.	
(b) appointing the youths of 16 years as apprentice, shall arrange the training for technology relating to the employment systematically in accord with the regulations prescribed by the skill development team.	
<i>The Settlement of Labour Dispute Law, 2012</i>	
<p>The Pyidaungsu Hluttaw hereby had enacted this Law for safeguarding the right of workers or having good relationship between employer and workers and making peaceful workplace or obtaining the rights fairly, rightfully and quickly by settling the dispute of employer and worker justly. Section 38 provides that no employer will fail to negotiate and coordinate in respect of a complaint within the prescribed period</p>	
<ul style="list-style-type: none"> <li>• Section 38 provides that no employer will fail to negotiate and coordinate in respect of a complaint within the prescribed period without sufficient cause</li> <li>• Section 39 provides that no employer shall alter the conditions of service of workers involved in disputes prior to investigation by tribunals</li> <li>• Section 40 provides that no party shall strike or lock-out without negotiation, conciliation and arbitration by Arbitration Body.</li> <li>• Section 51 provides that employer if commits acts without sufficient cause, may be liable to pay full compensation to workers as determined by Arbitration Body or Tribunal.</li> </ul>	
<i>The Workmen Compensation Act, 1923 (amended 2005)</i>	
<p>The Workmen's compensation act had been promulgated in 1923, amended in 2005, to provide for the payment by certain classes of employers to their workmen of compensation for injury by accident. There it clearly described for the liability for compensation of employer's, amount of compensation, compensation to be paid when due and penalty for default, method of calculating wages, review, commutation of half-monthly payments, payment of a lump sum amount, distribution of compensation, compensation not to be assigned, attached or charged, notice and claim, power to require from employers statements regarding fatal accidents, reports of fatal accidents and serious bodily injuries, medical examination, contracting, remedies of employer against stranger, compensation to be first charge on assets transferred by employer, special provisions relating to masters and seamen. The amendment law is for revising the monetary amount to update.</p>	
<i>Labour Organization Law, 2011</i>	
<p>This Law was enacted, to protect the rights of the workers, to have good relations among the workers or between the employer and the worker, and to enable to form and carry out the labour organizations systematically and independently.</p>	
<ul style="list-style-type: none"> <li>• Section 17 provides that Labour Organisations are free to organise and negotiate workers' rights if not meeting labour laws.</li> <li>• Section 18 provides that Labour Organisations may demand re-appointment of worker if cause</li> </ul>	

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	<p>of dismissal is related to labour organisation membership or activities or not conform with labour laws.</p> <ul style="list-style-type: none"> <li>• Section 19 provides that Labour Organisations have the right to send representatives to conciliation tribunals.</li> <li>• Section 20 provides that Labour Organisations have the right to participate and discuss workers' rights and interests with government and employers</li> <li>• Section 21 provides that Labour Organisation have the right to participate in collective bargaining in accordance with labour laws.</li> <li>• Section 22 provides that Labour Organisation may take collective actions in accordance with the relevant procedures, regulations and law.</li> </ul>
	<i>Minimum Wages Law, 2013</i>
	<p>This Law was enacted to meet with the essential needs of the workers, and their families, who are working at the commercial, production and service, agricultural and livestock breeding businesses and with the purpose of increasing the capacity of the workers and for the development of competitiveness.</p> <ul style="list-style-type: none"> <li>• Section (12), (a-e), it is stipulated that the employer shall not pay wage less than the minimum wage stipulated, not have the right to deduct any other wage.</li> <li>• Section (13) (a-g), it is stipulated that the employer shall inform rates of minimum wage relating to the business, allow the entry and inspection of the inspection officer, give the sick worker holiday for medical treatment in accord with stipulation and give holiday for the matter of funeral of the family of worker without deducting from the minimum wage.</li> <li>• Section (18), it is stipulated that the right of inspection officer to enter and inspect the workplace and report to the department.</li> </ul>
	<i>Payment of Wages Law, 2016</i>
	<p>Salaries are to be paid at the end of the month or, depending on the size of the employing enterprise, between 5-10 days before the end of the month. The employer is permitted and required to withhold income tax and social security payments. Other deductions, e.g., for absence, may only be withheld in accordance with the law.</p> <ul style="list-style-type: none"> <li>• Section 3: The employer (a) will pay for salary either Myanmar Kyats or Foreign Cash permitted by National Bank of Myanmar. When delivery the salary (b) If the employer needs to pay the other opportunities or advantages, he can pay cash together with other materials according employee's attitude.</li> <li>• Section 4: When the contract finish, employer need to pay the salary (not more than one month) to employees. For the permanent worker, need to pay per monthly. If more than 100 employees, need to pay within the 5 days from the end of month. If fire the employees, need to pay salary within two days after fire. When employee dies due to the accident, need to pay money as an insurance to employee's family within two days.</li> <li>• Section 5: If the employer has difficulties to pay wages on time because of significant events (eg natural disaster), the employer must report to the Department with evidence of payment at later date agreed with the employee.</li> <li>• Section (7): For finishing the contract, employer need to pay the salary (not more than one month) to employees. For the permanent worker, need to pay per monthly. If more than 100 employees, need to pay within the 5 days from the end of month. If fire the employees, need to pay salary within two days after fire. When employee dies due to the accident, need to pay money as an insurance to employee's family within two days.</li> <li>• Section (8): For the employer to report to the Department with evidence of payment at later date agreed with the employee if the employer has difficulties to pay wages on time because of significant events (e.g. natural disaster).</li> <li>• Section 9: When cut the salary due to the employees' absence, total cut salary not more than 50 % of his salary.</li> </ul>

Laws and Regulations	Description
	<ul style="list-style-type: none"> <li>• Section 10: Employer need to approval form the department as a penalty and cannot more than actual ravage rate when cut salary. No cut salary from the employees under 16 ages.</li> <li>• Section 11: Employers shall fine for the following actions or performance failure by the employees- <ul style="list-style-type: none"> <li>(a) Direct damage which is either intentional or due to negligence or due to the failure of the employee concerned with company property to take proper care.</li> <li>(b) A breach of the employment contract or breech of any rules for which a fine had been previously set.</li> </ul> </li> </ul> <p>Section 12: If a worker</p> <p>(a) Encounters any one of the following situations, he/she shall ask directly or via a registered Labor Organization or by the in-house Workplace Coordination Committee to the Employer:</p> <p>(1) Any unreasonable deduction from wages</p> <p>(2) Payment which is not made by the due date.</p> <p>(b) If the Employer takes no action, although asked in accordance with Section 12 Sub-Section (a), the Employee can present this to the Inspector within 6 month from the date of the deduction or from the date of the failure to render payment.</p> <p>Section 13: (a) The Inspector shall issue a decree after reviewing the case presented in accordance with Section 12 Sub-Section (b).</p> <p>(b) Not only the Employee, but also the Employer, has 30 days to appeal to the Chief of Inspector if they are not satisfied with the order.</p> <p>(c) The Chief of Inspector shall decree after reviewing the appeal applied in accordance with Sub-Section (b).</p> <p>(d) The Chief of Inspector's decision will be the final decision.</p> <p>Section 14: If an Employee carries out overtime work, he/she must be allowed the presiding overtime rate as set by the Law.</p>

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*Social Security Law, 2012*

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The Establishments Applied this regulation as guiding body for better social providing for mine workers. The prescriptions most relevant to the project are:

- Section 11(a), The following establishments shall be applied with the provisions for compulsory registration for social security system and benefits contained in this Law if they employ minimum number of workers and above determined by the Ministry of Labour in co-ordination with the Social Security Board:
  - (i) industries which carry out business whether or not they utilize mechanical power or a certain kind of power, businesses of manufacturing, repairing and servicing, or engineering businesses, factories, warehouse- es and establishments;
  - (ii) Government departments, Government organizations and regional administrative organizations which carry out business;
  - (iii) development organizations;
  - (iv) financial organizations;
  - (v) companies, associations, organizations, and their subordinate departments and branch offices which carry out business;
  - (vi) shops, commercial establishments, public entertaining establishments;
  - (vii) Government departments and Government organizations which carry out business or transport businesses owned by regional administrative body, and transport businesses carried out with the permission of such department, body or in joint venture with such department or body;
  - (viii) constructions carried out for a period of one year and above under employment agreement;
  - (ix) businesses carried out with foreign investment or citizen investment or joint ventured

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businesses;

- (x) businesses relating to mining and gem contained in any existing law;
- (xi) businesses relating to petroleum and natural gas contained in any existing law;
- (xii) ports and out-ports contained in any existing law;
- (xiii) businesses and organizations carried out with freight handling workers;
- (xiv) Ministry of Labour and its subordinate departments and organizations;
- (xv) Establishments determined by the Ministry of Labour, from time to time, that they shall be applied with the provisions of compulsory registration for Social Security System and benefits contained in this Law in co-ordination with the Social Security Board and with the approval of the Union Government.

• (b) Any establishment, applicable with the provisions of compulsory registration under sub-section (a) shall continue to apply with this Law even though any of the following situations occurs and such business is continued to carry out:

- (i) carrying out by one and more workers which is less than the stipulated minimum number of workers;
- (ii) Changing the employer or changing the category of business.

• Section 15, (a) The following funds are included in the Social Security Fund:

- (i) health and social care fund;
- (ii) family assistance fund;
- (iii) invalidity benefit, superannuation benefit, and survivors' benefit fund;
- (iv) unemployment benefit fund;
- (v) other social security fund for social security system of compulsory registration and contribution stipulated by the Ministry of Labour, in co-ordination with the Social Security Board, under clause (ii) of sub-section (e) of section 13;
- (vi) other social security fund stipulated that contribution may be paid after voluntary registration under clause (ii) of sub-section (e) of section 13;
- (vii) Social Security Housing Plan fund.

The employers and workers of establishments shall pay contributions after effecting compulsory registration to the fund contained in clauses (i), (iii), (iv) and (v) of sub-section (a).

(c) The contribution for family assistance benefit fund contained in clause (ii) of sub-section (a) shall not be stipulated in particular, but it shall be transferred from health and social care fund in stipulated proportion.

(d) The employers and workers of establishments may pay contribution voluntarily to the funds contained in clauses (vi) and (vii) of sub-section (a).

Section 18 (b), it is stipulated that the employer can deduct contributions to be paid by worker from his wages together with contribution to be paid by him and pay to the social security fund and in such case, he can incur the expense.

Section 48(b), The employers may effect insurance by registering voluntarily for the workers who are not applied to provisions of compulsory registration for employment injury benefit insurance system and by paying stipulated contribution to employment injury benefit insurance fund.

Section 49, (a) The employers and insured of establishments where the employer had registered compulsorily under sub-section (a) of section 48 or where the employer had registered voluntarily under sub-section (b) of section 48 who have paid contribution to employment injury benefit fund shall not apply to the provisions contained in the Workmen's Compensation Act in respect of the employment injury benefit. The insured who has effected insurance for employment injury benefit under sub-sections (a) and (b) of section 48 shall only be entitled to employment injury benefits contained in this Law.

Section 51: The employer (a) shall pay contribution monthly to Employment Injury Benefit Fund at the rates stipulated under section 50. Moreover, he shall also bear the expenses for paying as such; (b) shall pay defaulting fee stipulated under section 88, in addition to the contribution if fails to contribute after effecting insurance for employment injury benefit.

Section 53 (a) The employers and workers shall co-ordinate with the Social Security Board or insurance agency in respect of keeping plans for safety and health in order to prevent employment

Laws and Regulations	Description
	injury, contracting disease and decease owing to occupation and in addition to safety and educational work of the workers and accident at the establishment.
	Section 54 - The employer shall report to the relevant township social security office immediately if a serious employment accident occurs to his insured worker. There shall not be any delay without sufficient cause to report as such. A team of officers and other staff who inspect the establishments, if it is found out the employment injury, death, and contracting disease, shall report to the relevant township social security office in accord with the stipulations.
	Section 75, there it is clearly prescribed for keeping records of work and lists.
	<i>Leaves and Holidays Act, 1951</i>
	Under the Leave and Holidays Act (1951), every employee shall be granted paid public holidays as announced by the Government in the Myanmar Gazette. On average, Myanmar has 26 public holidays per year, depending on the date of the variable holidays. Myanmar law recognizes various types of leave. Leave is governed by the Leave and Holidays Act (1951), but additional rules may apply in accordance with other laws, such as the Social Security Law (2012) for employees contributing to the Social Security Fund.
	<i>Law protecting Ethnic Right, 2015</i>
	This is for the Equal right between the Ethnic living in Myanmar. It enacted that if an ethnic loose the right, he can complain to the Regional or State Government to get the equal chance and find the equal right.
	<ul style="list-style-type: none"> <li>Section 5 of Chapter IV provides that project matters shall be informed, coordinated and undertaken in consultation with ethnic groups if projects are in areas with ethnic groups.</li> </ul>
	The Succeeding laws to protect the right of Myanmar national similar in nature to this are
	<b>1. Monogamy Law (2015):</b> Concerning all those who are living in Myanmar, Myanmar Citizens who live outside of Myanmar, and foreigners who marry Myanmar citizens while living in Myanmar for preventing misconducting marriages.
	<b>2. Buddhist Women Special Marriage Law (2015):</b> Concerning the marriage between Buddhist Woman and other religious man. There prescribed the legal procedure, the conditions to be complied by non-Buddhist husband, the customs for dividing property when divorcing.
	<b>3. Religious Conversion Law (2015):</b> This is enacted for the freedom to convert from one religion to another, or a person without a religion has the freedom to convert to a religion. There prohibited to apply for a religious conversion with an intent to insult, disrespect, destroy, or abuse a religion.
	<b>4. Population Control Healthcare Law (2015);</b> This is for alleviate poverty, provide adequate quality healthcare, and ensure that family planning improves maternal and child health in the country. This Empowers region or state government that concerned with the special zone for healthcare to form region or state population control healthcare group to implementing the task as per the directives of the Ministry and region or state government and the Union Territory Governing body.

### 3.3 International Agreements and Treaty

Relevant international conventions to which Myanmar is a signatory include those related to waste management, biodiversity conservation and labour conventions. The key international conventions of relevance to the Project are included in Table 0-3.

**Table 0-3 International Conventions of Relevance to the Project**

Legislation	Relevance	Ratification Status (in Myanmar)	Project Compliance
<b>Environmental</b>			
Vienna Convention for the Protection of the Ozone	Not relevant to the Project as the Project will	Accession 16 <sup>th</sup> Sep 1998 (Vienna) &	The Project commits not to

Legislation	Relevance	Ratification Status (in Myanmar)	Project Compliance
Layer 1988 and Montreal Protocol on Substances that Deplete the Ozone Layer 1989	not use any ozone depleting substances.	Accession 24 <sup>th</sup> Nov 1993 (Montreal)	utilize ozone depleting substances.
Convention on Biological Diversity 1992	The Project will not be undertaken in habitats for biodiversity.	Ratified 25 <sup>th</sup> Nov 1994	The Project commits to comply as per Myanmar's
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	The Project may generate hazardous wastes.	Entered into force 6 <sup>th</sup> April 2015	The Project commits to comply as per Myanmar's
United Nations Framework Convention on Climate Change 1992 (UNFCCC) and Kyoto Protocol 1997	The Project will form part of Myanmar's total emissions output.	Entered in force 23 <sup>rd</sup> Feb 1995 (UNFCCC) and 16 <sup>th</sup> Feb 2005 (Kyoto Protocol)	The Project commits to comply as per Myanmar's
Asia Least Cost Greenhouse Gas (GHG) Abatement Strategy (ALGAS) 1998	The Project will produce air emissions from the vessels.	1998	The Project commits to comply as per Myanmar's

### **3.4 Proponent's contractual and other commitments**

The Project Proponent will comply with the Myanmar Environmental Conservation Law, Environmental Conservation Rules, Environmental Quality (Emission) Standards and all applicable international standards those do not contradict with Myanmar regulation.

The Project commits to comply, undertake the following:

- The Project Proponent will comply with commitments, mitigation measures and management plans stated in this EIA report.
- The Project Proponent is responsible for its actions and omissions and those of its contractors, Sub-contractors, officers, employees, agents, representatives, and consultants employed, hired, or authorized by the company acting for or on behalf of the Project.
- Fully implement the EMP, all Project commitments, and conditions, and is liable to ensure that all contractors and subcontractors of the Project comply fully with all applicable Laws, the Rules, this Procedure, the EMP, Project commitments and conditions when providing services to the Project.
- Be responsible for, and shall fully and effectively implement, all requirements set forth in the ECC, applicable Laws, the Rules, this Procedure, and standards.
- Timely notify and identify in writing to the Ministry, providing detailed information as to the proposed Project's potential Adverse Impacts.
- Respect and comply with the customs, traditions, and traditional culture of the ethnic groups in the Union.



- Abide by the terms and conditions, stipulations of special licenses, permits, and business operation certificates issued to them, including the rules, notifications, orders, and directives and procedures issued by the MIC and the applicable laws, terms and conditions of contract and tax obligations.
- Carry out in accordance with the stipulations of the relevant department if it is, by the nature of business or by other need, required to obtain any license or permit from the relevant Union Ministry government departments and governmental organizations, or to carry out registration.
- Immediately inform the Commission if it is found that natural mineral resources or antique objects and treasure trove not related to the investment permitted above and under the land on which the investor is entitled to lease or use and not included in the original contracts.
- To inform the village administrative office and the Department of Historical Research if any historical thing is found during the project operations.
- Abide by the applicable laws, rules, procedures and best standards practiced internationally for this investment so as not to cause damage, pollution, and loss to the natural and social environment and not to cause damage to cultural heritage.
- Close and discontinue the investment only after payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce.
- Pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directives and so forth during the period of suspension of investment for a credible reason.
- Pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease and death due to the work.
- Supervise foreign experts, supervisors and their families, who employ in its investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar.
- Respect and comply with the labour laws.
- Have the right to sue and to be sued in accordance with the laws.
- Pay effective compensation for loss incurred to the victim, if there is damage to the natural environment and socioeconomic losses caused by logging or extraction of natural resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a Permit or an Endorsement.
- Ensure equal rights for local workers and avoid salary bias, i.e., ensure that local and foreign workers have the same salary at the same level.
- Ensure that all foreign employees apply for the proper work permit and visa through the Myanmar Investment Commission (MIC).
- Provide rights and benefits including but not limited to, leave, holidays, overtime pay, compensation and social security. Most of the relevant particulars are in the Myanmar Companies Act.
- Settle disputes, within the law, between workers, employers, consulting experts or any other personnel involved in the business operation.



**De Heus' five principal ingredients of responsible feeding 5 areas of attention regarding responsible feeding<sup>27</sup>:**

1. Allow healthy animals / fish to produce optimally
2. Purchasing with a focus on sustainability
3. Environment- friendly production and logistics
4. Valuable contribution to society
5. Committed and driven employees

The commitment letters of Project Developer and Third-Party Organization is attached in Appendix F1 of this report.

### **3.5 Institutional Framework**

In Myanmar, matters pertaining to Health, Safety and Environment (HSE) requirements are generally under the jurisdiction of the ministries and state-owned enterprises. Key ministries and agencies that have jurisdiction over HSE matters in industrial operations (including Aqua Feed Mill Factory works) are included in Table 0-4.

***Table 0-4 Key Ministries and Agencies Involved in HSE***

<b>Ministry/Agency</b>	<b>Responsibility</b>
Ministry of Natural Resources and Environmental Conservation (MONREC)	The Environmental Conservation Department (ECD) of MONREC has ultimate responsibility in the review and approval, or otherwise, of submissions under the IEE/EIA process.
Myanmar Investment Commission (MIC)	MIC is a government agency responsible for coordinating with ministries (such as the MOEE) and other state entities to facilitate foreign investment in Myanmar. The MIC is also responsible for granting MIC permits which enable foreign investors to carry out business activities under the Myanmar Investment Law (2016).
Ministry of Industry (MOI)	Responsible for managing manufacturing industries according to engineering norms and relevant national code of industrial practice for professional ethic and industrial development in Myanmar.
Ministry of Transport and Communications (MOTC)	Responsible for managing the development of transport and communication and has various departments under this ministry which deals with various types of transport including road, air, water navigation to meet relevant national standards for communication and transport in Myanmar.

### **3.6 Project's Environmental and Social Standards**

MONREC has established environmental quality standards, the National Environmental Quality Emission Guidelines (2015) (NEQEG). The NEQEG provide the basis for regulation and control of noise and air emissions and effluent discharges from projects in order to prevent pollution and protect

<sup>27</sup> <https://www.deheus.com/about-de-heus/corporate-social-responsibility>

the environment and public health. The NEQEG is similar to that recommended by the IFC General EHS Guidelines for Aquaculture.

The Project Proponent will implement the project by complying as per NEQEG for all phases (construction, operation, disclosure, and post-disclosure) where applicable. a) IFC Environmental, Health and Safety Guidelines for Aquaculture; b) CODEX Alimentarius (FAO/WHO): “Code of Practice for fish and fishery products”; c) ICUN, “Sustainability of Fish Feed in Aquaculture”; d) Code of Practice on good animal feeding (CAC/RCP 54-2004), etc. will also take the reference for meeting international best practice.

### 3.6.1 Effluent Discharge

Effluent and storm water flows should be managed so as to achieve the following effluent levels.

**Table 0-5 NEQEG on Effluent Discharge Levels**

Parameter	Unit	Guideline Value
Biological oxygen demand	mg/l	30
Chemical oxygen demand	mg/l	250
Oil and grease	mg/l	10
pH	S.U. <sup>a</sup>	6-9
Total coliform bacteria	100 ml	400
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

<sup>a</sup>Standard unit

### 3.6.2 Air and Noise Emission

The principal sources of air emission are fugitive dust from earth works and materials handling and transport facilities. Prevention and control of air emissions should be sufficient to achieve the general air emission guideline for ambient air quality. The air and noise emission parameters are described in Table 3-6 and 3-7 respectively.

**Table 0-6 NEQEG Air Emissions Parameters**

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Dichloromethane	24-hour	3,000
Nitrogen dioxide	1-year	40
	1-hour	200
Ozone	8-hour daily maximum	100
Particulate matter $\text{PM}_{10}$ <sup>a</sup>	1-year	20
	24-hour	50
Particulate matter $\text{PM}_{2.5}$ <sup>b</sup>	1-year	10
	24-hour	25
Sulphur dioxide	24-hour	20
	10-minute	500

a  $\text{PM}_{10}$  = Particulate matter 10 micrometres or less in diameter

b  $\text{PM}_{2.5}$  = Particulate matter 2.5 micrometres or less in diameter

**Table 0-7 NEQEG Noise Level Parameters**

Receptor	One-hour LAeq (dBA) <sup>a</sup>	
	Daytime 07:00 – 22:00 (10:00 - 22:00 for Public holidays)	Night-time 22:00 – 07:00 (22:00 - 10:00 for Public holidays)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

<sup>a</sup> Equivalent continuous sound level in decibels

### **3.6.3 Guidelines and Standards for Project Related Activities**

IFC General EHS Guidelines for Ports, Harbours and Terminals (2007) and Myanmar National Environmental Quality Emission Guideline (2015) are main references throughout all phases of the Projects. But regarding for other related activities, the Project Proponent will consider and comply to meet the undermentioned guidelines and standards.

- 1) Effluent Standards for Work Camps, Sanitary Facilities, Domestic Wastewater, Landfills (Pollution Prevention and abatement handbook. 1998. The World Bank)
- 2) Drinking water Quality Standards (National drinking water quality standards.2014. Ministry of Health, Myanmar)
- 3) Ambient water quality standards for the protection of aquatic life (Myanmar National Environmental Quality (Emission) Guidelines, December 2015)
- 4) Ambient Noise standards Noise Management (General EHS Guideline.2007. International Finance Corporation, Guidelines for Community Noise. 1999. World Health Organization) Social Guidelines.

## **4. Project Description and Alternatives**

### **4.1 Project Background and Project Plan**

#### **4.1.1 Project Background:**

Construction Start Date : 15/10/2018 since piling;  
Construction Completion : 100%, currently it is in operational phase (Nov 2021)  
Construction Finished Date : 20/12/2019;  
Pre-run Production Start Date : 20/11/2019;  
Actual Running Date : 29/11/2019

**4.1.2 Infrastructure Components<sup>28</sup>:** Intake Building, Production Tower, Dosing Silo, Corn Silo (3x 3200 MT) Diameter 13.5M, Wheat Silo (6x 360 tons) Diameter 5.5M, Raw Material Warehouse, Finished Product Warehouse, Empty Bag Storage, Liquid Tank and IBC Plant, Transformer Room, Ash Storage, Steam Boiler, Toilets, and Internal Roads.

The total building area is 15,702.92 sqM and the total building land measurement is 21,997.1 sqM. Green zone % of the whole premises is 28.61%, where landscaping and shady trees will be planted.

**Table 4.1: Project Infrastructure Components**

ITEMS	SYMBOL	DIMENSION (m)		QUANTITY	BUILDING AREA (m²)	No. FLOOR	FLOOR AREA (m2)	SUM. FLOOR AREA (m²)	BUILDING RATIO (%)
		LENGTH	WIDTH						
I. BUILDING ITEMS					8578.91		4214.52	12793.43	19.39
I.1. EXISTING ITEMS									
I.2. NEW ITEMS CONSTRUCTION					8578.91		4214.52	12793.43	19.39
INTAKE BUILDING	N1			1	235.00	1	-	235.00	0.53
PRODUCTION TOWER	N2	25.45	20.70	1	526.82	9	4,215	4,741.34	1.19
DOSING SILOS	N3	20.70	8.55	1	176.99	1	-	176.99	0.40
CORN SILOS (3X2000TONS), D13.50m	N4			3	429.20	1	-	429.20	0.97
WHEAT SILOS (6X360TONS), D5.50m	N5			6	142.50	1	-	142.50	0.32
RAW MATERIAL WAREHOUSE	N6	79.75	35.00	1	2791.25	1	-	2,791.25	6.31
FINISHED PRODUCTS WAREHOUSE	N7	79.75	38.00	1	3030.50	1	-	3,030.50	6.85
EMPTY BAGS STORAGE	N8	20.70	17.30	1	358.11	1	-	358.11	0.81
LIQUID TANK + IBC PLANT	N9	14.50	8.00	1	116.00	1	-	116.00	0.26
TRAFO	N10	10.00	9.55	1	95.50	1	-	95.50	0.22
ASH STORAGE	N11	14.55	5.00	1	72.75	1	-	72.75	0.16
STEAM BOILER	N12			1	219.30	1	-	219.30	0.50
TOILET WORKSHOP	N13	20.00	10.00	1	200.00	1	-	200.00	0.45
TOILET	N14	3.00	3.00	1	9.00	1	-	9.00	0.02
BIKE PARKING	N15	22.00	4.00	2	176.00	1	-	176.00	0.40
II. INTERNAL ROAD, YARD					8025.20			0.00	18.14
EXISTING ROAD	R								
NEW INTERNAL ROAD	R1				8025.20				18.14
(others INF.)									
III. GREENERY					27645.89				62.48
GREENERY	GR				27645.89		-	-	62.48
					44250.00			0.00	100.00

## 4.2 Project Development and Implementation

### 4.2.1 Production Capacity:

Phase 1 : 6,500 MT/month  
Phase 2 : 16,000 MT/month

<sup>28</sup> Figure 7: Layout Plan of Aqua Feed Mill Factory Project

**4.2.2 Raw Material to be used:** (1) AQUA MIN premix, (2) AQUA VIT Premix, (3) Barley, (4) BLOODMEAL contact-dried, (5) BROKEN RICE, (6) Brown Rice, (7) Calcium propionate 95%, (8) CANOLA, (9) CHOLINE CHLORID 60 CN, (10) Corn A (Local), (11) CORNGLUTEN, (12) DDGS, (13) DDGS, (14) Dry Fish, (15) Endox V Dry, (16) Fish Meal, (17) HYDROLYZED FEATHER MEAL, (18) LIME FINE, (19) L-LYSINE-HCL 79%, (20) Local Pure Corn DDGS, (21) Local Rice DDGS, (22) LYSINE SULPHATE 70%, (23) MEATBONEMEAL, (24) METHIONIN 90%, (25) METHIONIN 99%, (26) MONOCAL.PHOSP 22.7, (27) Natuphos E 5000 L, (28) PALMKERNEL EXPELLER, (29) Peanut Cake, (30) PHYZYME XP 5000 L 0-250 sFU, (31) POULTRY MEAL, (32) Rapeseed Meal, (33) RICE BRAN DEOILED, (34) RICEBRAN FF Dried, (35) SALT-NACL, (36) SEA FISHOIL import, (37) SOYALECITHINE CRUDE, (38) Soybean meal, (39) Soybean Oil, (40) Sunflower Meal, (41) THREONIN 98% powder, (42) TRYPTOPHAAN 98%, (43) WHEAT 11CP, (44) WHEATBRAN MEAL coarse, (45) ZINC SULPHATE 350.

**4.2.3 End Products from Aqua Mill:** Each finished product packing bag size is 35 kg. The finished products include:

1. Power Fingerling Fish Feed, bag size 10kg;
2. Power Fingerling Fish Feed, bage size 25 kg;
3. Fish Starter Feed, bag size 25 kg;
4. Fish Grower Feed, bag size 25 kg;
5. Fish Finisher Feed 1, bag size 40 kg;
6. Fish Finisher Feed 2, bage size 40 kg;
7. Pangasius Fish Feed, bag size 50 kg;
8. Fingerling for Snake-head fish, bag size 10kg;
9. Fingerling for Snake-head fish, bag size 25 kg;
10. Starter for Snake-head fish, bag size 25 kg;
11. Grower for Snake-head fish, bag size 25 kg;
12. Finisher for Snake-head fish, bag size 25 kg;
13. Fingerline for Sea bass, bag size 25 kg;
14. Starter for Sea bass, bag size 25 kg;
15. Grower for Sea bass, bag size 25 kg;
16. Shrimp Feed (Powder), bag size 25 kg;
17. Shrimp Feed (Crumble), bag size 25 kg;
18. Shrimp Feed (Pelled), bag size 25 kg.

**4.2.4 Kinds of Fish focused to feed:**

Fresh water fish such as: Rohu (NgaMyitChin), Catla (NgaThineGaungPhwa), Mrigal (NgaGyin), Common Carp (Myetsar), Pangasius (NgaTan), Tilapia (Tilapia), Stinging Catfish (NgaKyee), Walking Catfish (NgaKhu), Climbing Perch (NgaPyeiMa), Butter Catfish (NgaNuThann), Featherback (NgaPhel), Giant River Catfish (NgaGyaung), Pacu (NgaMoke), Frog (Phar), Swamp Eel (NgaShintNi), Eel (NgaLinnPan), and Giant Fresh Water Prawn (YayChoPaZunHtokeGyee).

#### **4.2.5 Future plan:**

Sea Water fish such as: Grouper (KyaukNga), Snapper (NgaParrNe), Pomfret (NagMokePhyu), Giant Tiger Shrimp (Monodon) {PaZunKyarr}, and White Legs Shrimp (Vannamei) {PaZunPhyu}

#### **4.2.6 Project Aim:**

The main objective is to improve a wide range of Aqua Feed Products in Myanmar and to make our people have access to safe and nutritious food for Fish culture in the Fishery Sector.

Futhermore, economic status of our Country will be increased. According to the Myanmar Companies Law 2017, the project proponent established its Manufacturing of Fish Feed and other Animal Feed Product in Myanmar to enhance the health and production of animals and agricultural products according to international norms and standards. For construction phase, job opportunities will occur for local people. Some raw materials will be imported and majority from local markets will be used.

#### **4.3 Aqua Feed Processing**

Aqua feed processing technology equipment / machinery are available in various models and with optimal accessories to offer the optimum solution for a specific production needs:

- **Hammer mills:** capable of several size reduction jobs including grinding, shredding and fluffling;
- **Air and dust filters:** efficient and reliable air and dust filtrate for products amd plants;
- **Weighing systems:** Precise and fast weighing of raw materials;
- **Mixer:** for optimum mixing of feed ingredient;
- **Extruder Aqua feed:** for the production of high quality extruded aquafeed pallets;
- **Combi – zone dryer:** optimum drying of the extruded feed pallet;
- **Conditioners:** Designed to simultaneously blend and condition the infeed to a pallet mill;
- **Cooler:** preventing the pellets from decay and making the palltes ready or storage.

Moreover, Aquafeed Mill is being equipped with various pollution control machines such as Intake Bag Filer, Boiler Bag Filter, Hamer Bag Filter, Pulverizer Bag Filter, and All-Sport Filter machines to capture potential odour emmision, fugitive dust, fine particles, vapor / gas during the production process to ensure a clean and healthy environment for its workers for optimal occupational health.<sup>29</sup>

#### **4.3.1 Process Stage<sup>30</sup>:**

Raw Materials, which are stored in the Raw Storage Silo are sent to the Production Intake building.

The following steps are the production stages of the Aqua Feed Mill process:

- 1) Raw Material Receiver: Stage1: Receiving, Stage 2: Intake; Stage 3: Weighing;
- 2) Batching and Mixing;
- 3) Grinding and Pre conditioning;
- 4) Extrusion
- 5) Drying;
- 6) Screening
- 7) Enrobing (Coating) and Cooling;
- 8) Finish Product Storage (Silo);

<sup>29</sup> Table 2.2: List of pollution control machines used in production process of Aquafeed

<sup>30</sup> Figure 5 and Figure 6: Process Flow Chart and Diagram of Aqua Feed Mill Factory



9) Weighing and Packaging.

10) Ware house and delivery

Extrusion Reliability affects factory performance in the Aquafeed Production. Appropriate Extrusion Technology is used for overall equipment effectiveness<sup>31</sup> and yield efficiency<sup>32</sup>, which are key factory performance indicators in the aquafeed processing. Samplings of the finished products are made for quality control of the Aquafeed produced and adjustment to the Extrusion unit is duly made for optimum results.<sup>33</sup>

#### **4.3.2 Pollution Control during Production Process**

During the production process, conservation of the environment is strictly adhered to, by incorporating the following list of pollution control Machinery to capture potential odour emissions, fugitive dust, and particulate matter and to maintain a friendly and safe environment for its production team members and the environs of the project site.

**Table 4.2: List of Pollution Control Machinery utilized in Aqua Feed Mill Factory Project**

<b>No</b>	<b>Machine name</b>	<b>Machine code</b>	<b>Specifications(D*L)</b>	<b>Qty;</b>	<b>Unit</b>	<b>Frequency</b>
1	10 Intake Bag filter	10RP01-FI01&02	150mm*2500mm	40	Pcs	Weekly
2	Boiler Bag filter	520BO01-FI01	150mm*5550mm	106	Pcs	1T/3M
3	Hammer Bag filter	50HM01-FI01	160mm*4210mm	48	Pcs	Monthly
4	Pulverizer Bag filter	100PU01-FI01	150mm*2800mm	48	Pcs	1T/3M
5	15 Intake Bag filter	15RP01-FI01	150mm*2500mm	20	Pcs	Weekly
6	All spot filter	All spot filter	145mm*1450mm	4	Pcs	Weekly

#### **4.4 Description of Project Size and Phase:**

Size of Project is Medium and it is defined upon the following factors

Duration	50 Years
Production Capacity	6500 tons/month during First Phase of Project with increased production to 16,000 MT/month by end Phase.

The project Timeline for Pre-Construction, Construction and Operation stages are as follows;

**4.4.1 For Pre-Construction stage;** requesting for permission from relevant government authorities.

There is no estimated waste to be discharged during pre construction stage.

**4.4.2 For Construction stage:** The estimated time frame for construction stage is one year. At Primary stage (first six months of construction stage): Laying of Foundations, construction of Production Tower, Dosing Silo will be implemented.

<sup>31</sup> An indicator of runtime loss

<sup>32</sup> An indicator of material loss

<sup>33</sup> [www.aquafeed.com](http://www.aquafeed.com)



At Secondary stage (second six months of construction stage): Construction of Intake Building, Corn Silo (3x3200 MT) dia 13.5 m, Wheat Silo (6x360 tons) Dia 5.5m, Raw Material Warehouse, Finished Product Warehouse, Empty bag Storage, Liquid Tank + IBC Plant, Transformer Room, Ash Storage, Steam Boiler, Toilets and internal Roads and other appurtenant structures will be constructed.

#### **4.4.3 For Operation stage:**

Manufacturing, Importing, Storing and Distribution of Aqua Feed as described in project purpose.

#### **4.5 Project Components:**

- Intake Building
- Production Tower
- Dosing Silo
- Corn Silo (3x3200 MT) dia 13.5M
- Wheat Silo (6x360 tons) dia 5.5M
- Raw Material Ware house
- Finished Product Ware house
- Empty Bag Storage
- Liquid Tank + IBC Plant
- Transformer Room
- Ash Storage
- Steam Boiler
- Toilets
- Internal Road
- Total building Area = 15,702.92 sqM
- Total Building Land Measurement = 21,997.1 sqM
- Green Zone % of whole area = 28.61%

**4.5.1 Water Supply and Electricity:** For this proposed project, water from tube wells will be used as main water source. Electricity is being provided by the Myaung Dagar Industrial Zone. The project proponent aims to install a stand by transformer of suitable capacity with authorization form Ministry of Electricity and Energy.

**4.5.2 Solid Waste Management:** For solid waste management, the Local Municipality collects the project's solid waste twice a day and disposed it to the designated landfill site.

**4.5.3 Wastewater Treatment Plant:** For wastewater treatment process, the project will utilize a Bio Septic tank for the treatment of Project's wastewater and the treated water will be duly tested for safe disposal into the drains and nearest water body. Recyclable waste will be reused by the project.

#### **4.6 Description of the Selected Alternative by Project Phase**

Slight alterations in Project design have been made for improvement and practically of the project implementation. During the past early stages of the pre-construction and construction stages, the Aquafeed production process chart has 12 stages of steps (Fig 8).

However, now that Aquafeed is in its operational phase, additional steps (step 13) has been added to the previous process chart (Fig 8 vs Fig 10); the specific inclusion being step 11: that means weighing after coating process before bagging the finished product (FP); although initially in Fig 8, after step 8: Drying, there is a weigh scale, to which the dried product is being weighed.

#### **4.7 Comparison and Selection of the preferred Alternative**

**Project Alternative:** Need for other alternative of initial project design has to be identified after consultation meeting. However, there is no alternative project site at present, except this existing location at Plot No. 309 - 310, 311 which has been legally allowed to the company by the relevant government authorities.

**Project design alternative:** Extrusion Reliability affects factory performance in the Aquafeed Production. Appropriate Extrusion Technology is vital for overall equipment effectiveness<sup>34</sup> and yield efficiency<sup>35</sup>, which are key factory performance indicators in the aquafeed processing. Sampling of the finished products are made for quality control of the Aquafeed produced and alternate adjustment to the Extrusion unit is duly made for optimum results.

**Alternative Project installation design:** Initial project design had been two production lines. However, due to increase in end-user demand, the production line has been duly increased to four production lines as of Nov 2021.

**Project plans for acquiring certification:** The project is planning for acquisition of international certificates such as ISO 22000: 2018, ISO 45001: 2018, and Global GAP CFM, etc.

The principles of the Hazard Analysis and Critical Control Point (HACCP) procedure may have application in the aquaculture feed milling if they are generally cost effective in terms of providing scientifically sound protection to animal and human health. Critical control points will have to be identified and in this regard FAO's Draft Code of Hygienic Practice for the Products of Aquaculture (FAO, 1996) provide a model for possible adaptation. Current Good Manufacturing Principles (CGMP) are represented in the balance of procedures and it is the use of CGMP employed worldwide which has proven successful in production of wholesome and effective feeds. As a result, adverse health impacts on humans or animals from compound feeds has been negligible.<sup>36</sup>

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<sup>34</sup> An indicator of runtime loss

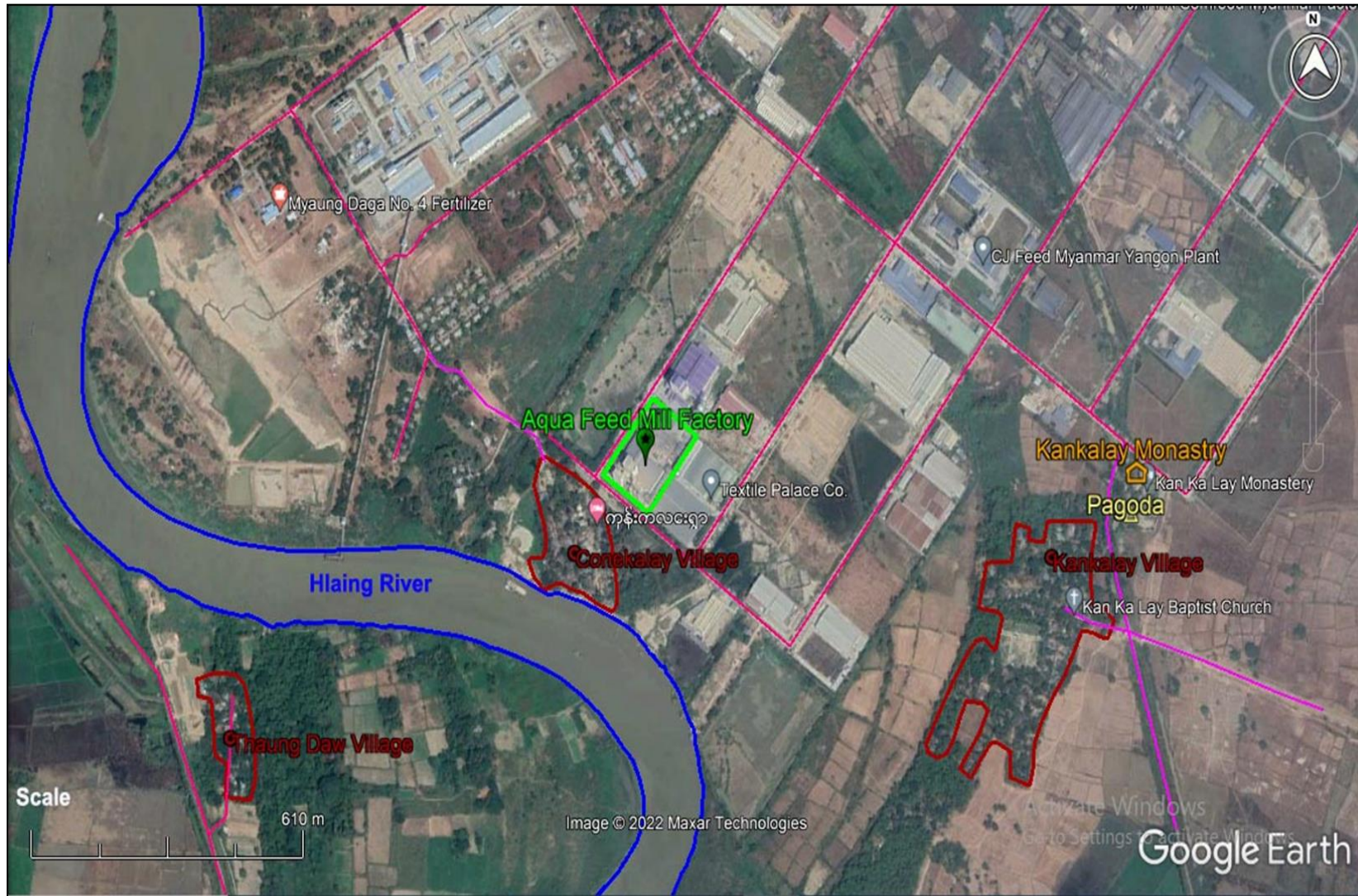
<sup>35</sup> An indicator of material loss

<sup>36</sup> Stephen-Hassard Q.D. "Draft Technical Guidelines for Good Aquaculture Feed Manufacturing Practice" <http://om.ciheam.org/article.php?IDPDF=99600015>

[illegible]

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**Figure 2: Satellite Image of Aqua Feed Mill Factory Project Area Location**



Figure 3: Location of Project Area in Hmawbi Township







*Figure 5: Plan Overview of Project Area in Hmawbi Township, 2021*



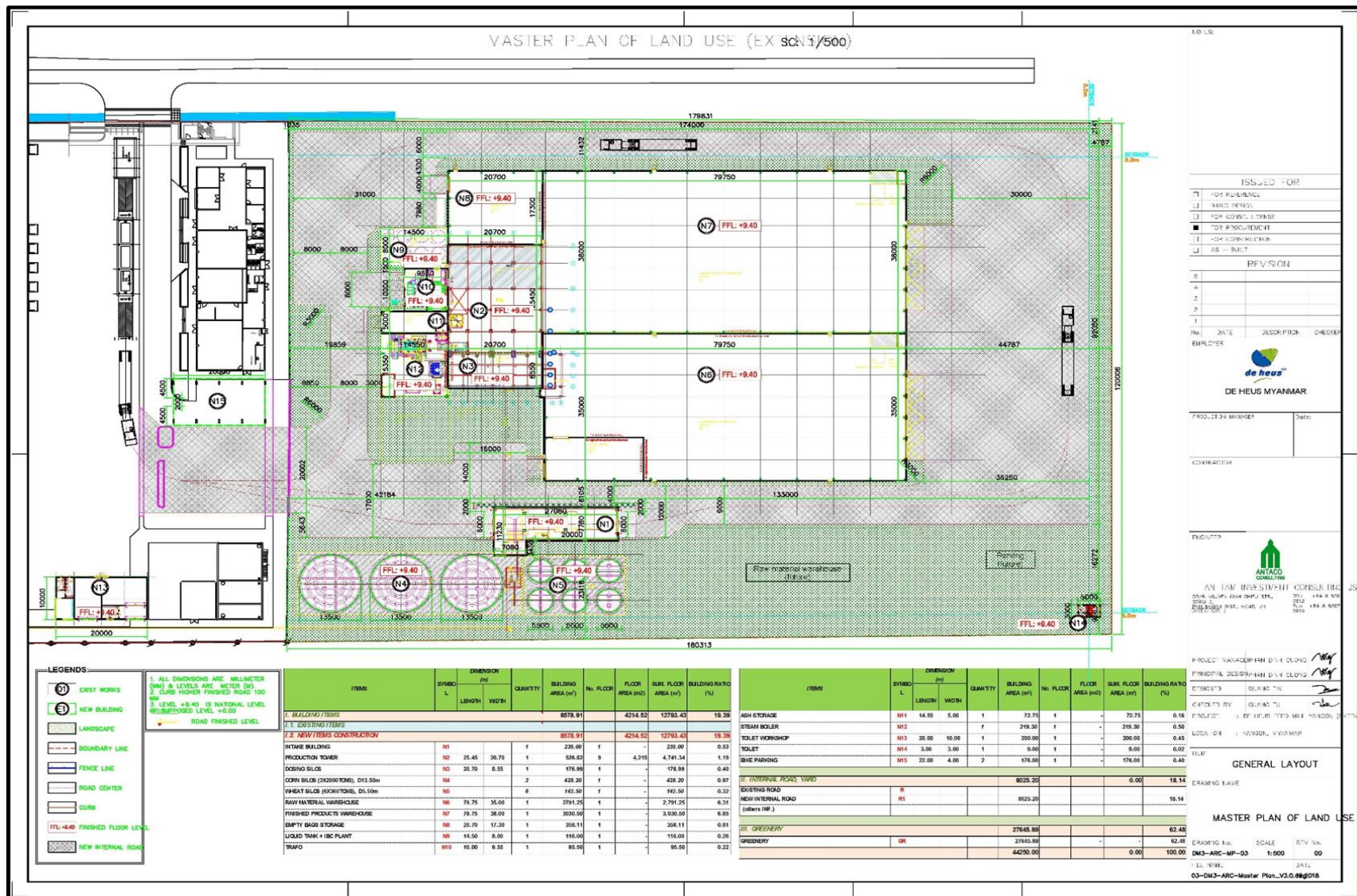
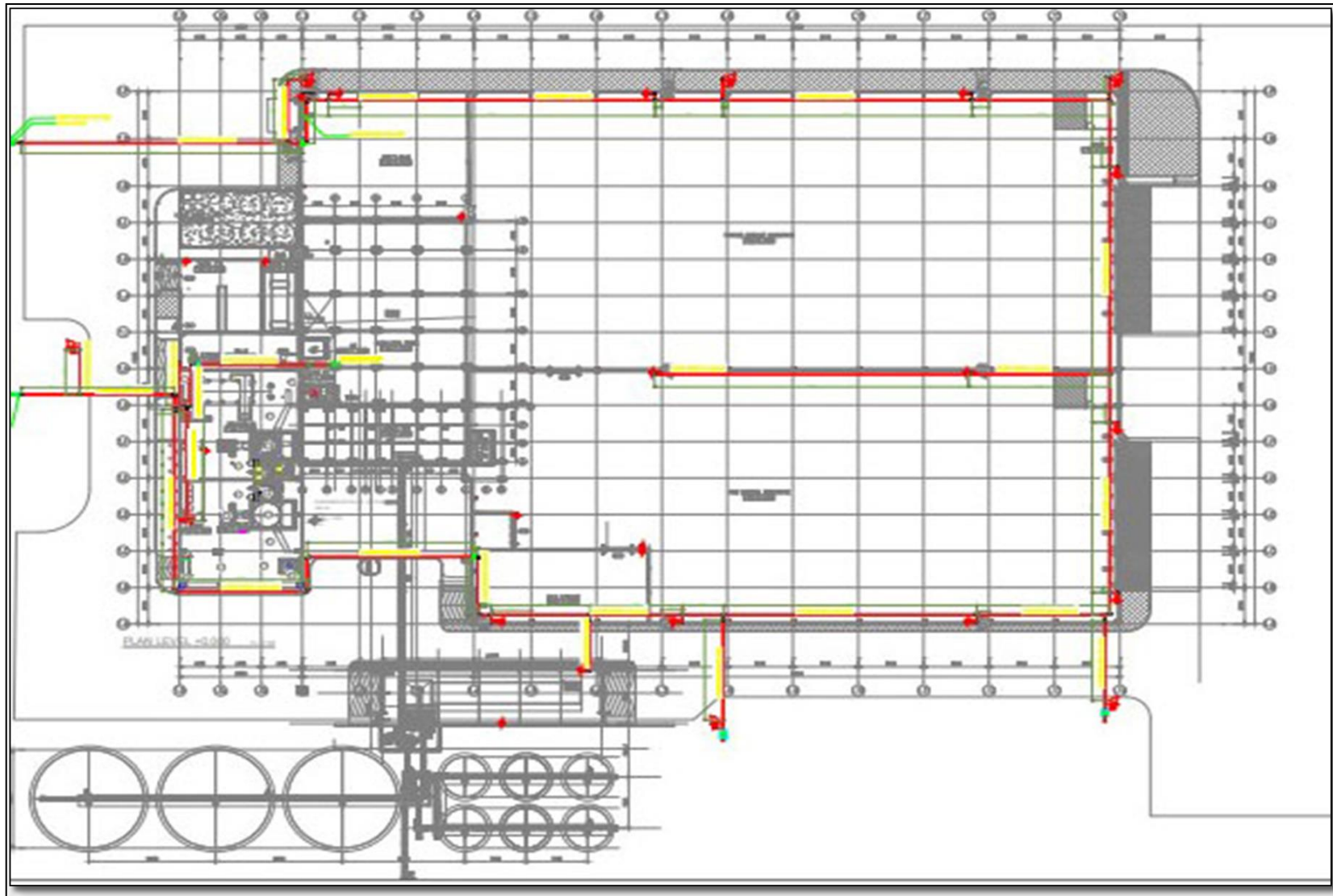


Figure 6: Layout and Land Use Plan of Aqua Feed Mill Factory



*Figure 7: Master Plan of Fire Fighting System, Aqua Feed Mill Factory, Myaung Dagar Industrial Zkone, Hmawbi Township*

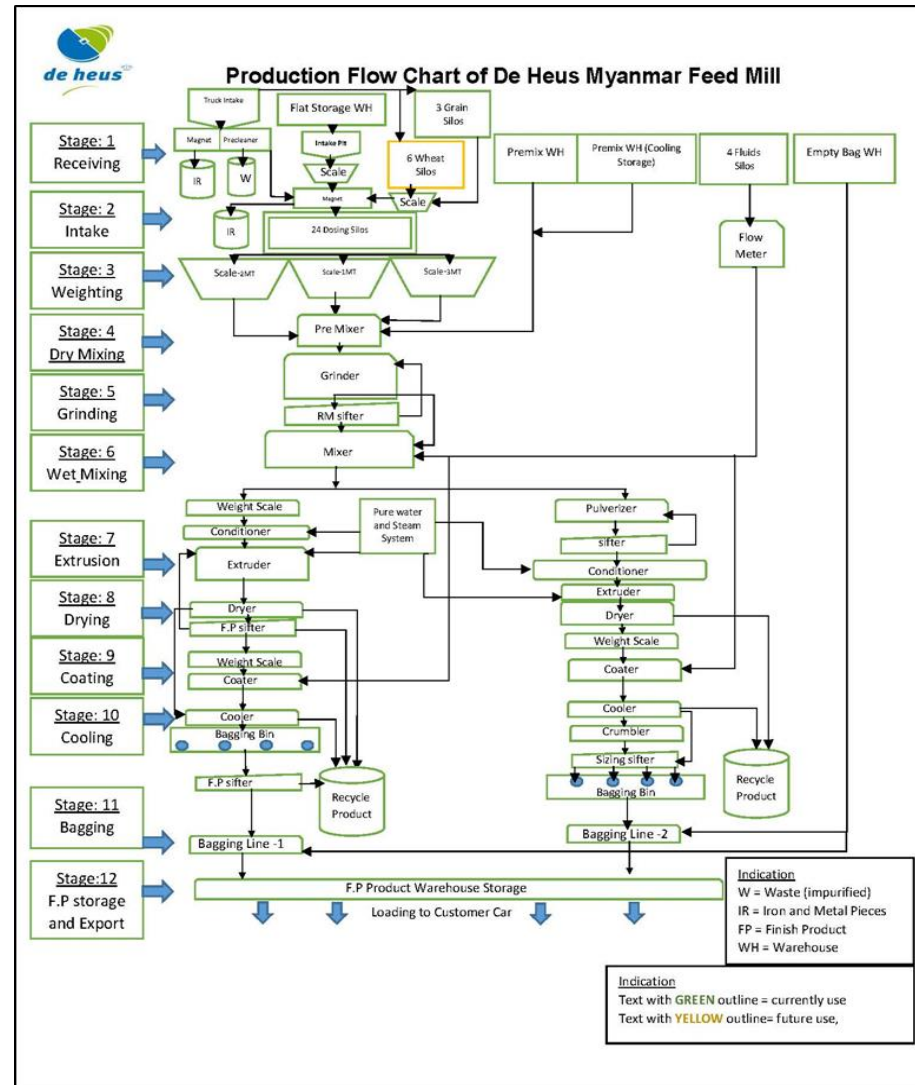
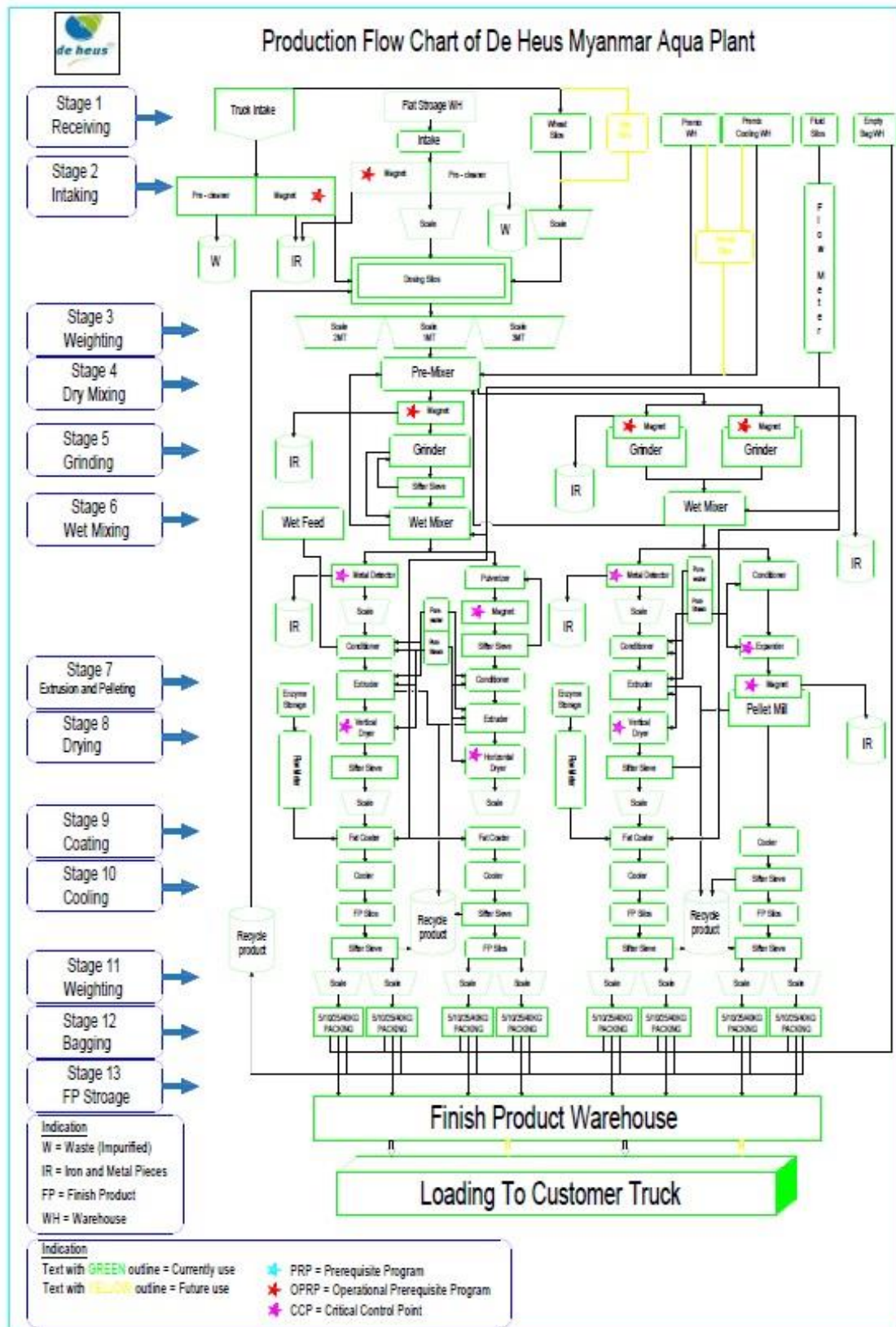


Figure 8: General Process Flow Chart of Aqua Feed Mill Factory Project (2019)



		Proposed Personal Protective Equipment for Aqua plant																								
				Eye protection		Body protection			Foot protection		Head Protection					Respiratory protection			Head Protection		Full Protection	Ear Protection				
No	Location	Attention to:	Hazards	Safety glasses	Face shield	Lab Coat	Reflected vis	Apron	Slit Apron	Lab-shoe	Slipper	Safety Shoe	Cotton Hand glove	Chemical Resistant glove	Plastic	Anti-cut	Heat Resistant cap	Mask N-95 dust mask	Cartridge Respirator or P-3	Bump cap	Hard helmet	Hair Cap	Body harness for Work	Ear Plug	Ear Muff	Remark
1	Warehouse Raw, FG area	Staff Forklift Op;	Hit by forklift hazards						ok			ok									ok					
2	Boiler Area	Operator	Hot surface, steam, carbon dust						ok			ok						ok	ok		ok					
3	Liquid tank area	All	Slippery hazards						ok			ok	ok								ok					
4	Production Tower	All	dust, trip hazards, hitting column and						ok			ok	ok						ok		ok			ok		Ear plug for extruder area
6	Hand add area	Mixer	Chemical dust						ok			ok	ok						ok							
7	Premix Room area	Mixer	Chemical dust						ok			ok	ok						ok		ok					
8	Workshop	All	Fumes, sparks, molten	ok	ok				ok			ok	ok					ok	ok		ok					Grinding, Drilling, Welding
11	Intake area	Staff	Dust, sharp						ok			ok							ok		ok					
12	Silo Area	All	Dust						ok			ok	ok						ok							Cleaning
13	Laboratory	All	Chemical spill, slippery hazards	ok		ok					ok		ok	ok					ok							
14	Canteen (Kitchen)	All	hygiene, hot oil, slippery hazards					ok	ok		ok				ok							ok				
15	Security	All					ok		ok			ok								ok						

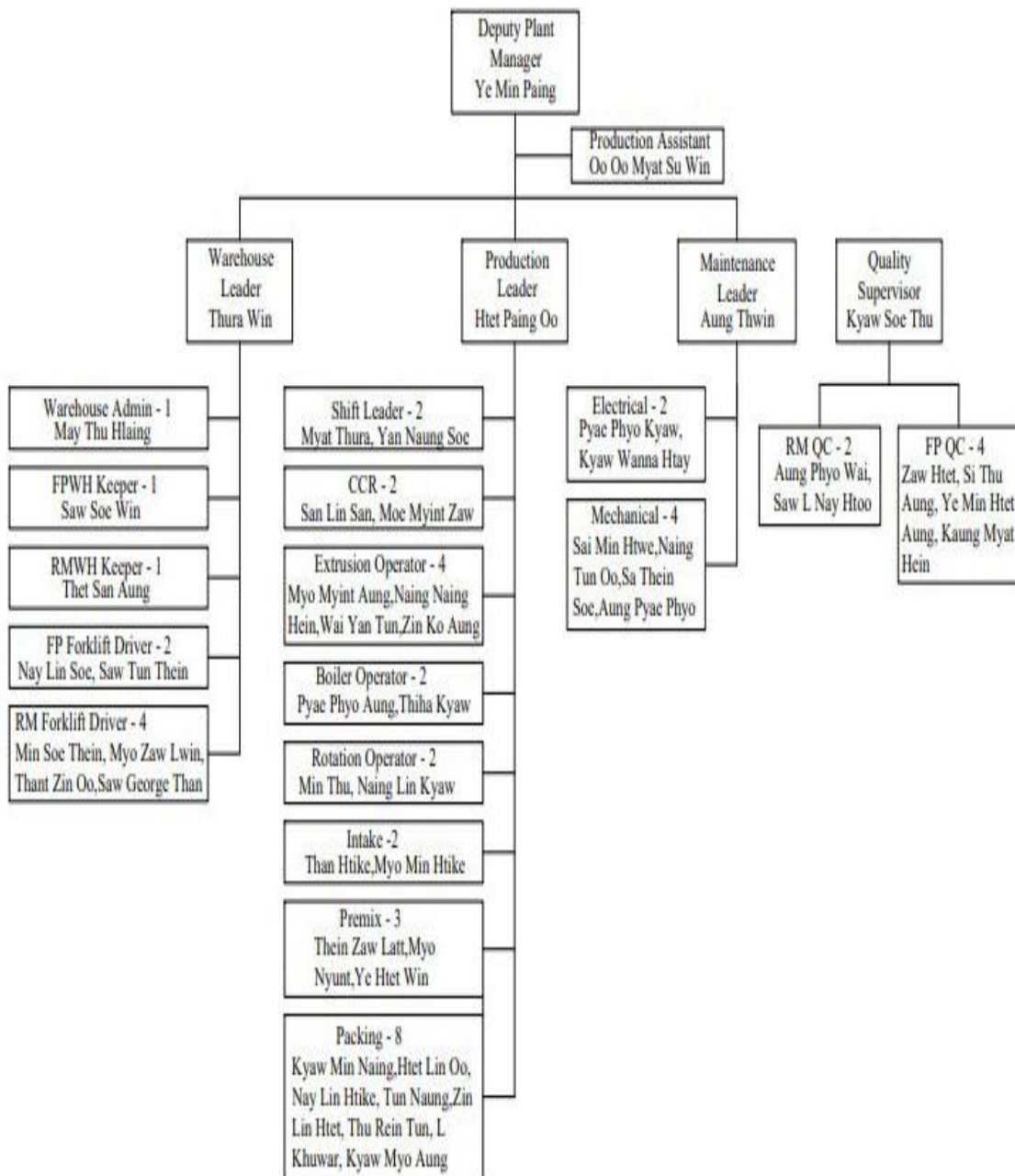
Figure 9: Proposed PPE (Personal Protective Equipment) for Aqua Feed Mill Factory Staff



**Figure 10: Production Flow Chart of De Heus Aqua Feed Mill Process<sup>37</sup>**

<sup>37</sup> Update Process Chart of Aquafeed Mill, Nov 2021

## Aqua Feed Mill Organization Chart



**Figure 11: Organization Chart of Aqua Feed Mill (Production Team Members)**



## Soil Map of Yangon Region

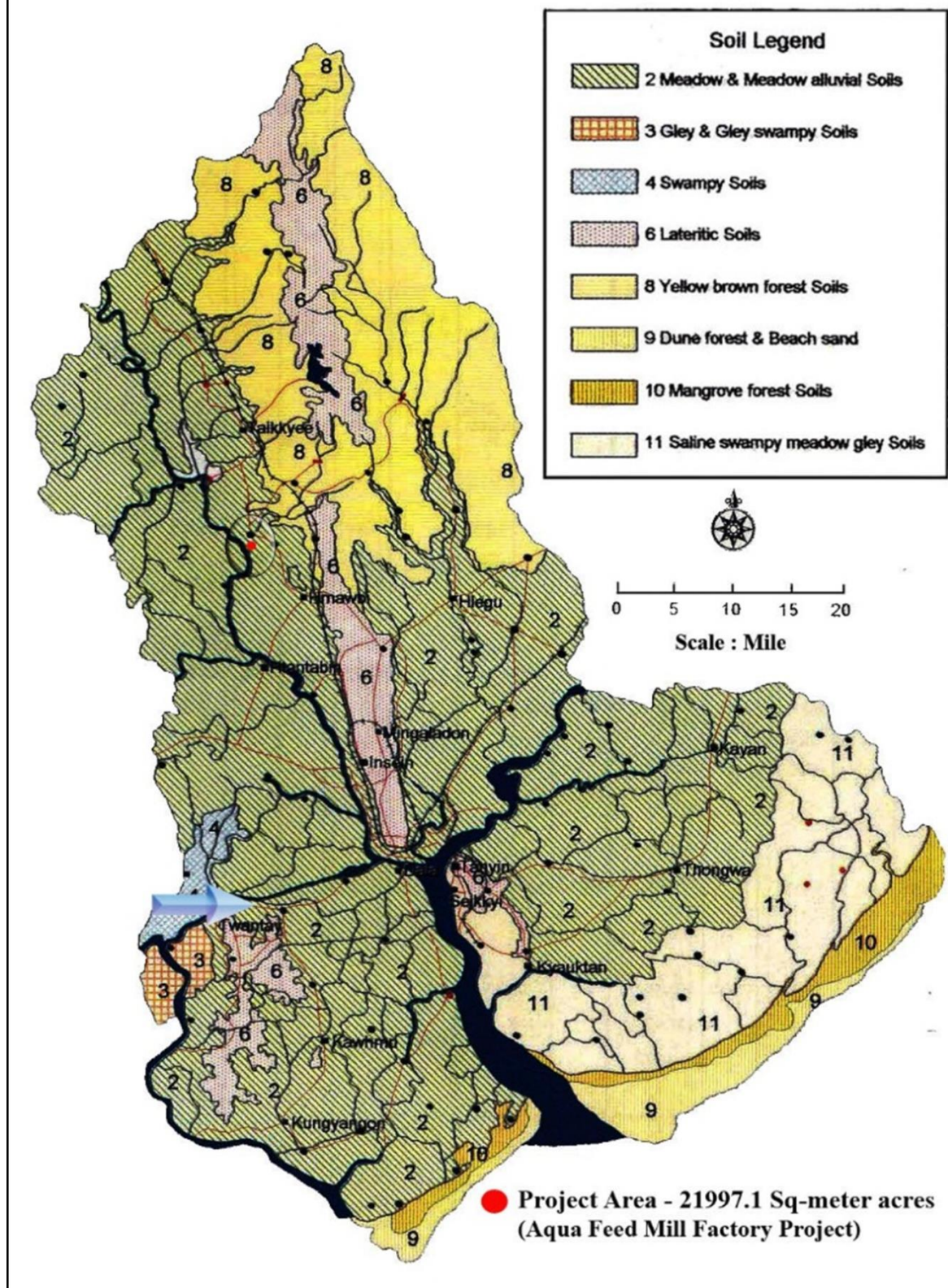
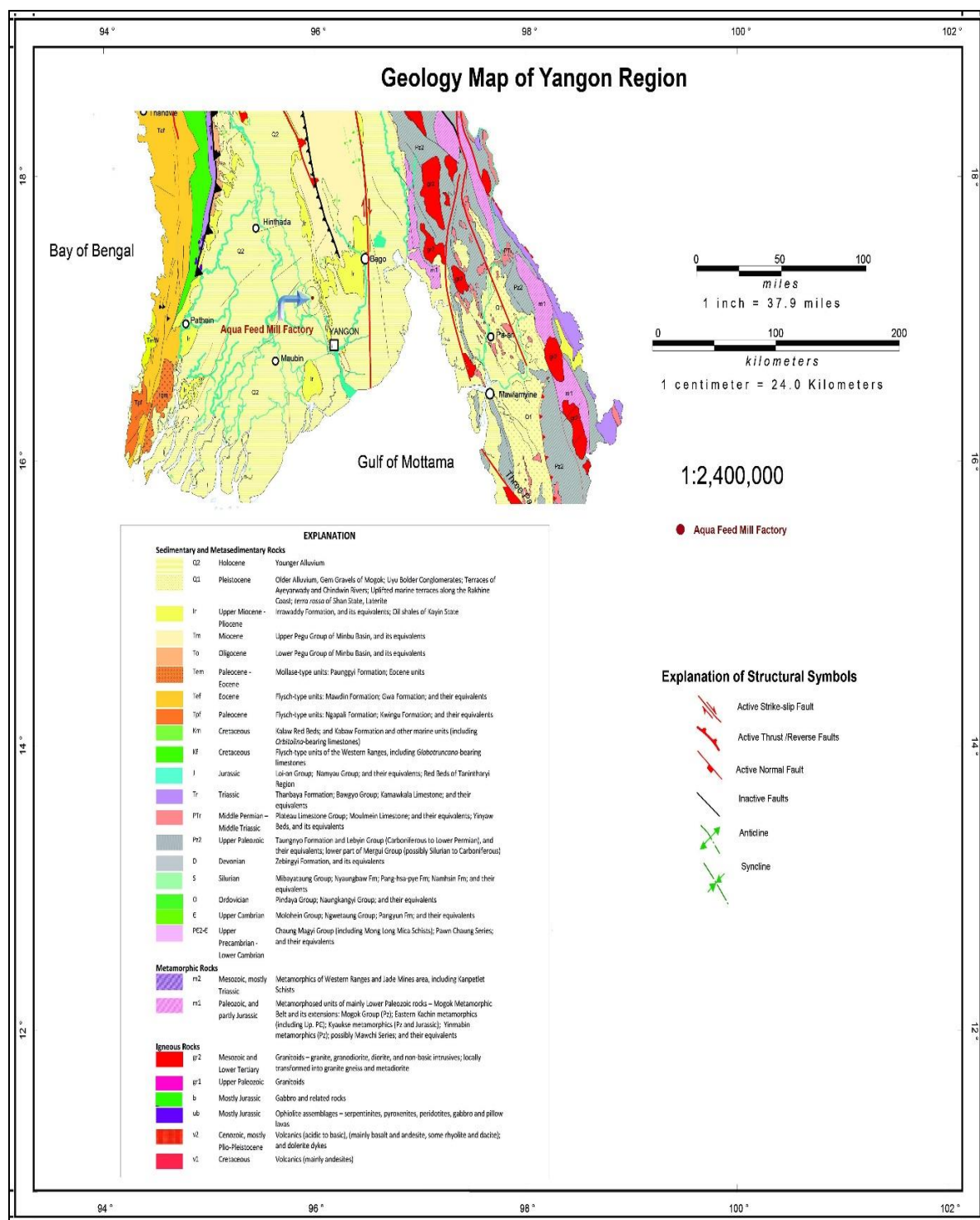


Figure 12: Soil Map of Project Area





**Figure 13: Geology Map of Project Site**

## 5. Description of the Environment

The De Heus Factory premise occupies 10 acres of land at Plot No.309-311 in the Myaung Dagar Industrial Zone Area (Figures 1- 3). The plant land is flat and low lying and located at 0.22 km away from the bank of the Hlaing River.

The specific project area (5.5 acres of De Heus Project Premises) is located at Hmawbi Township of Yangon Region, which is lying at Longitude 95° 58' 6.4" E and Latitude 17° 9' 21.24" N; at 27 ft (8.2 m) above mean sea level; having subtropical climate; hot and humid weather. There is no fisheries human settlement inside and near the proposed project area as the site is located in Myaung Dagar Industrial Zone area; which is established as an industrial development area.

The soil of the project site is Meadow and Meadow Alluvial Soil. Previously, this type of soil is used for growing paddy. The texture of these soils is clay, clay loan, silty clay and silty clay loan. The infiltration rate is slow to very slow. It is very sticky and very plastic when wet and very hard when dry. However, the specific study area has already been urbanized with human activities over the past many years. Therefore, no mangroves nor sensitive or conservation worthy habitats in or surrounding environment of the project area are observed and confirmed during the updated baseline study in Nov 2021.

### 5.1 Setting the Study Limits

As the project site is being located in the Industrial Zone area, there is no more native flora and fauna observed in the environs. However, the study limits for the Baseline Data was updated for:

- A. Biological Components:
- B. Physical Components
- C. Infrastructure and Services
- D. Socio Economic Components,
- E. Public Health Components
- F. Cultural Components
- G. Visual Components and Amenity of the Hmawbi Township, where the project site is being located as described in the following pages of this Report.

### 5.2 Biological Components

Myanmar is an agricultural land with many tropical forests and biodiversity. However, the specific study area of the project has already been urbanized with human activities over the past many years. Therefore, only a few trees and no mangroves species in the vicinity of the project area and along the Hlaing River are observed during the baseline study in May 2019 and updated in Oct 2021 that no legally protected area exists in the environs of the project site.

**Forest Status at Hmawbi Township:** There is no forest status in Hmawbi Township nor any legally protected area in the region.

### 5.3 Physical Components

#### 5.3.1 Climate and Hydrology

The project area is located at Hmawbi Township of Yangon Region; having subtropical climate; hot and humid weather with with Recorded maximum temperature of 39.3°C and Recorded minimum temperature of 10.0°C.

Hmawbi Climate and hydrological data were collected from Department of Hydrology and Meteorology for the environmental impact assessment of this Project. The data was analyzed based on the available rainfall, temperature, relative humidity, and wind speed in the study area.

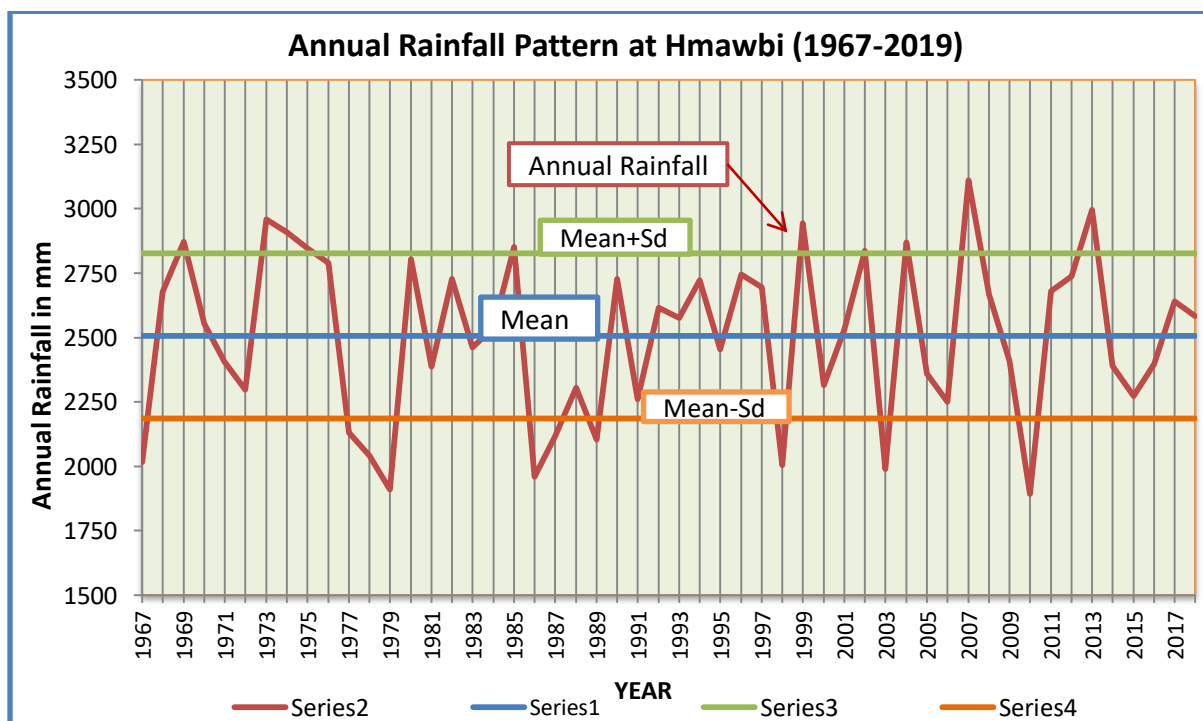
### 5.3.2 Rainfall and Temperature

**Table 5.1 Mean Monthly Rainfall in mm at Hmawbi (1967-2018 Average))**

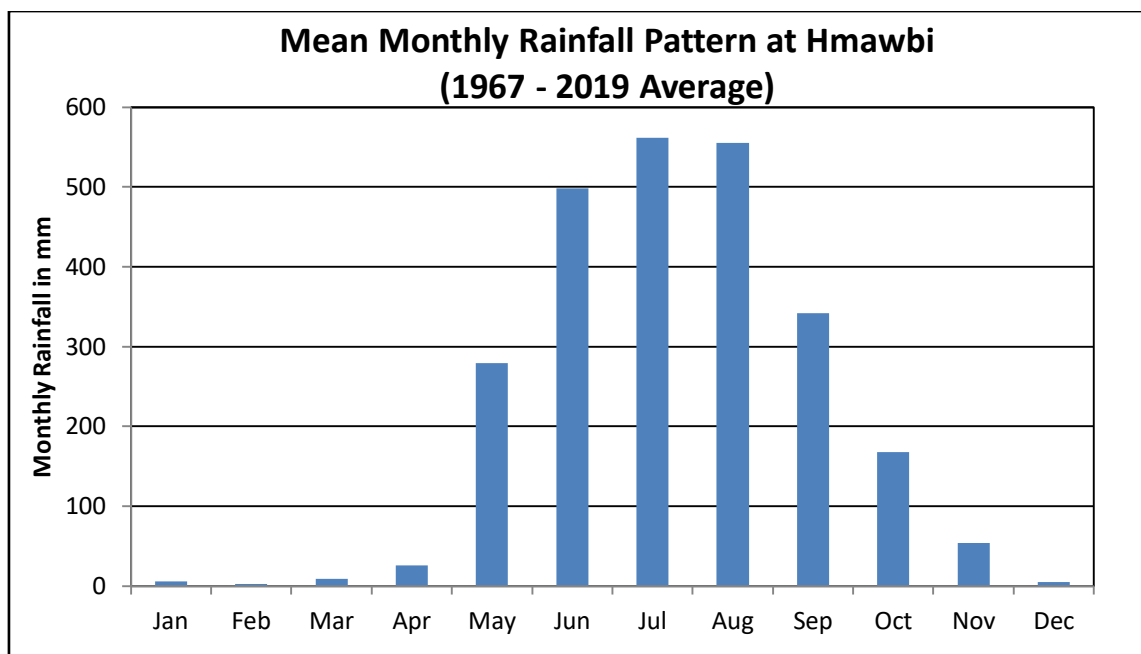
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	6	2	9	26	280	498	562	555	342	168	54	5	2507

**Table 5.2 Monthly Rainfall in millimeter at Hmawbi (Mean Year, Wet Year, Dry Year)**

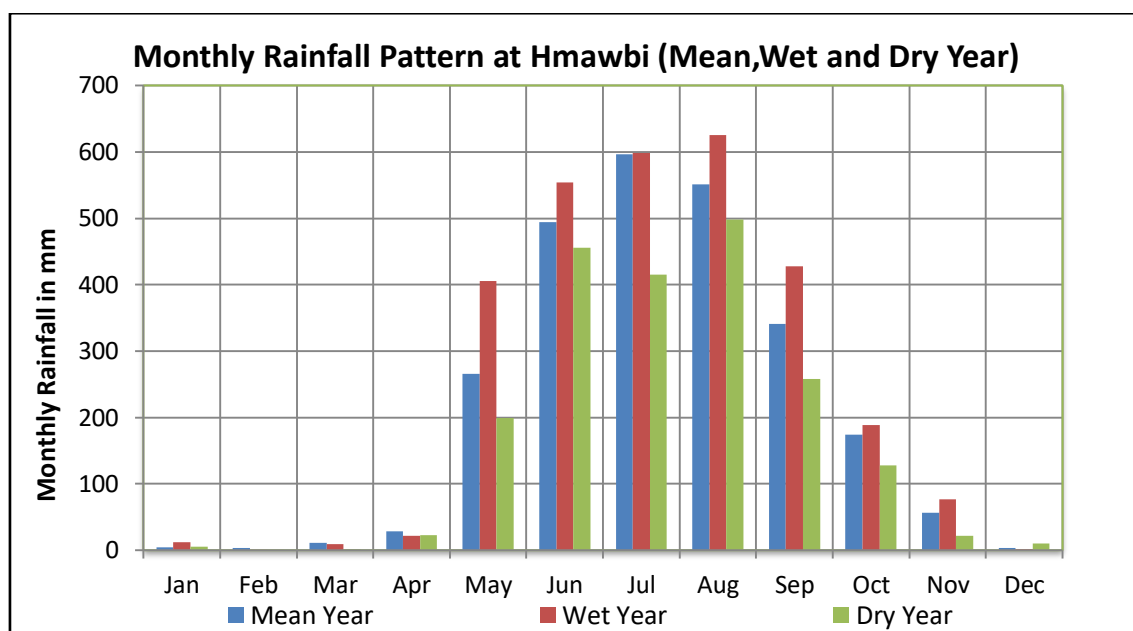
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Year	5	3	12	28	266	494	597	551	341	174	56	4	2531
Wet Year	12	1	9	22	405	554	598	625	427	188	77	2	2920
Dry Year	6	1	2	22	199	456	415	498	258	128	22	11	2017



**Figure 14: Annual Rainfall Pattern at Hmawbi (1967-2019)**



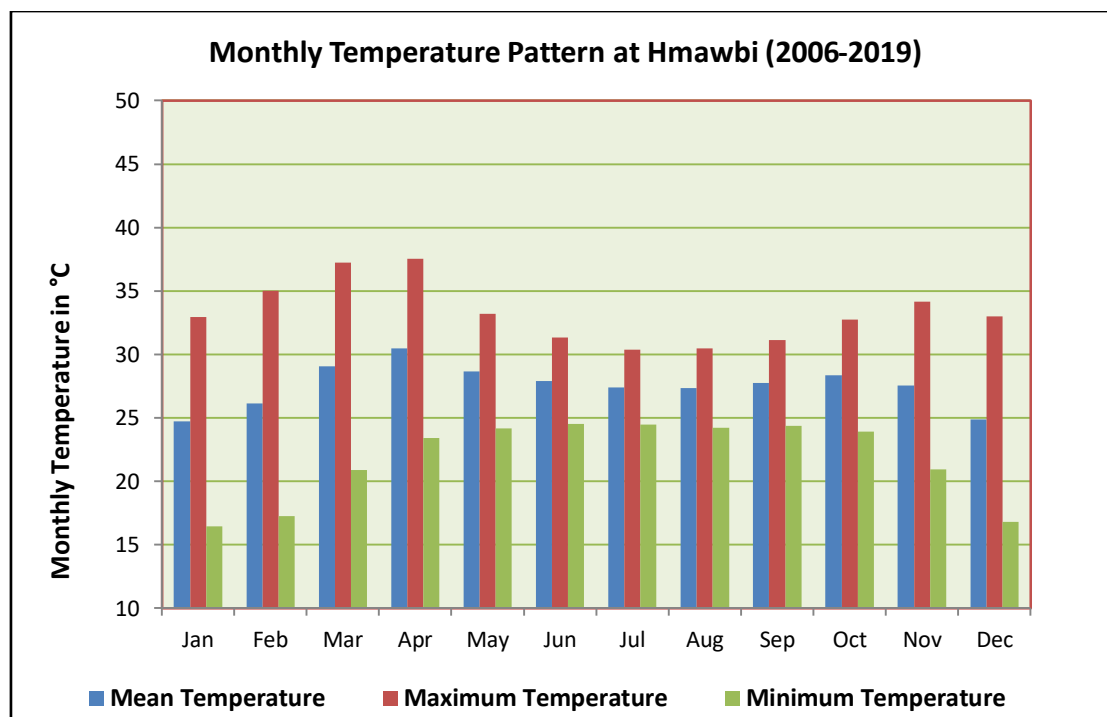
*Figure 15 Mean Monthly Rainfall Pattern at Hmawbi (1967-2019)*



*Figure 16 Monthly Rainfall Pattern at Hmawbi (Mean, Wet and Dry Year)*

**Table 5.3 Monthly Mean, Maximum and Minimum Temperature at Hmawbi in °C**

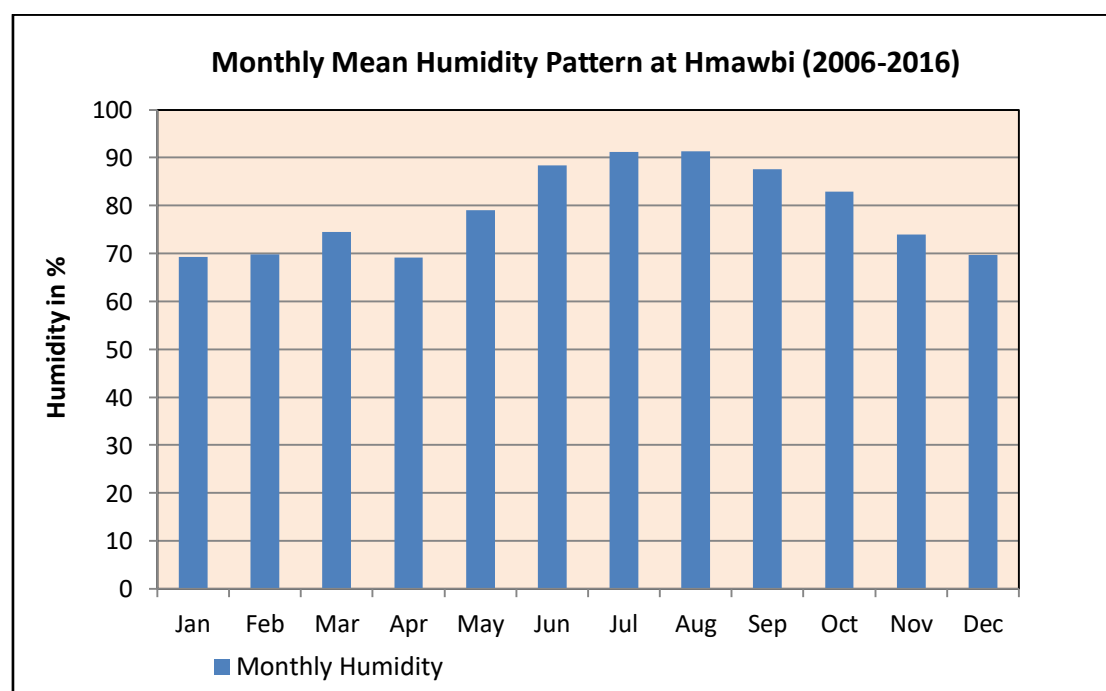
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	24.7	26.1	29.1	30.5	28.7	27.9	27.4	27.3	27.8	28.4	27.6	24.9	27.5
Maximum	32.9	35.0	37.3	37.6	33.2	31.3	30.4	30.5	31.1	32.8	34.2	33.0	33.3
Minimum	16.5	17.2	20.9	23.4	24.2	24.5	24.5	24.2	24.4	23.9	20.9	16.8	21.8



*Figure 17 Monthly Mean, Maximum and Minimum Temperature Pattern at Hmawbi*

*Table 5.4 Monthly Mean Relative Humidity at Hmawbi in % (9:30 hrs) (2006-2016)*

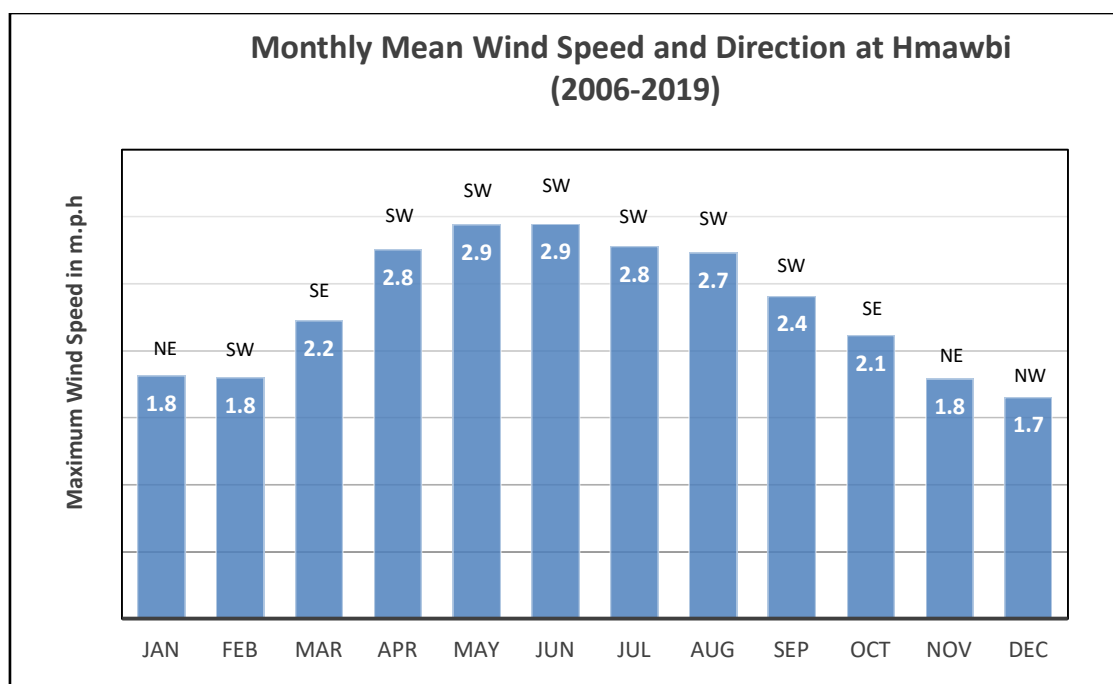
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	69	70	74	69	79	88	91	91	88	83	74	70	79



*Figure 18 Monthly Humidity Pattern at Hmawbi (2006=2016)*

**Table 5.5 Monthly Mean Wind Speed (m.p.h) and Direction at Hmawbi (2006-2019)**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	1.8	1.8	2.2	2.8	2.9	2.9	2.8	2.7	2.4	2.1	1.8	1.7
Direction	NE	SW	SE	SW	SW	SW	SW	SW	SW	SE	NE	NW



**Figure 19 Monthly Mean Wind Speed and Direction Pattern at Hmawbi (2006-2019)**

Source: Meteorological and Hydrological Department

### 5.3.3 Natural Disasters

There are no natural disasters in the area of Hmawbi Township.

### 5.3.4 Geology

The regional geological study has been made in an area which includes ridges and deltaic lands, lying south of the Bago Yoma. This area is in a north to south trending synclinal basin containing a thick Tertiary-Quaternary deposits. Hmawbi area is covered by younger alluvium and underlines. Irrawaddy Formation bed. This layer between is unconformity. These sediments include clays, silts, sands and predominantly fine to coarse gravels<sup>38</sup>.

### Soil Condition and Water Quality of Project Area

**5.3.5 Soil of Project Area:** The soil types and the soil characteristics of representative soils in the project area are available in details respectively. According to soil types and soil characteristics of Myanmar, Ministry of Agriculture and Irrigation, March 2004, the soils of the project area are Meadow and Meadow alluvial soils which are prominent.

### 5.3.6 Meadow soil

<sup>38</sup> Figure 8: Geological Map of Project Area

These are meadow soils with neutral reaction, whereas some have the alluvial reaction. Although they are different in plant nutrition, they can be used for pulses and vegetables. Meadow soils of the lower Myanmar have yellow brown colour with acid to neutral soil reaction, the meadow soil which occur near the river plains with occasional tidal flood are non-carbonate. They usually contain large amount of salts. They contain more plant nutrient than Meadow soils of upper Myanmar. Regardless of the more content of iron, these soils can be utilized for rice and vegetables.

### 5.3.7 Meadow Alluvial soils

These can be found in the flood plains. They have the texture of silty clay loam and they can be utilized for ground nut, sesame, sunflower, jute, sugarcane and vegetable in addition to paddy cultivation. They have the neutral soil reaction and are rich in available plant nutrients.

Although these soils are suitable for paddy, vegetable, ground nut, sesame, sunflower, jute, sugarcane, pulses and corn, these are covered with sands for construction of the factories and mills at present. These areas have been already demarcated for Myaungdakar Industrial Zone in Hmawbi Township, Yangon Region,

### 5.3.8 Domestic Water Quality

The domestic water quality of Aqua Feed Mill Factory Project was tested on 10 Nov 2021 and the water quality conforms to the WHO Guideline value and is chemically potable. The physico-chemical parameters tested and its results are depicted below in Fig 20. The detailed analysis of the environmental monitoring report is attached in Appendix G of this Report.

No.	Parameter	Result	Unit	Method	WHO Guideline Value	Remark
1	Ammonia	1.42	mg/L	Nessler Method	NA	-
2	Arsenic	Nil	mg/L	Hach Test Kits	0.01 mg/L	-
3	Calcium	0.80	mg/L	EDTA Titrimetric Method	150 mg/L	Under the Guideline
4	Chloride	4.96	mg/L	Argentometric Method	250 mg/L	Under the Guideline
5	Color	Nil	PUC	Hanna (HI 97727) Color of Water Photometer	15 PUC	Under the Guideline
6	Conductivity	42	μS/cm	Hanna (HI 991300) pH, EC, TDS and temperature meter	2500 μS/cm	Under the Guideline
7	Dissolved Oxygen	5.17	mg/L	Hanna (HI 98193) DO and BOD meter	6 mg/L	Under the Guideline
8	Magnesium	0.49	mg/L	EDTA Titrimetric Method	100 mg/L	Under the Guideline
9	Manganese	<0.006	mg/L	1-(2 Pyridylazo)-2- Naphol (PAN) Method	0.4 mg/L	Under the Guideline



10	pH	6.53	-	Hanna (HI 2211)- pH & Temperature Meter	6.5 – 8.5	Within the Guideline
11	Salinity	8.96	mg/L	Argentometric Method	NA	-
12	Sulfate	<2	mg/L	USEPA SulfavVer 4 Method	250 mg/L	Under the Guideline
13	Temperature	24.8	°C	Hanna (HI 2211)- pH & Temperature Meter	25 °C	-
14	Total Dissolved Solids	28	ppm	Hanna (HI 991 300)- pH, EC, TDS and Temperature meter	1000 mg/L	Under the Guideline
15	Total Hardness	4.00	mg/L	EDTA Titrimetric Method	mg/L	Under the Guideline
16	Turbidity	Nil	NTU	Milwaukee (MI 415) – Turbidity Meter	5 NTU	-

\*WHO Guideline Value

NA = Not Available

**Figure 20: Domestic Water Quality Results of Aqua Feed Mill Factory Project, 10 Nov 2021**

### 5.3.9 Air and Noise Quality

Air and noise quality of the Aqua Feed Mill Project was monitored on 10 Nov 2021 and the test results are as described below in Figure 15. PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> exceeds the allowable guideline values according to the National Environmental Quality (Emission) Guideline, 2015. It was observed that many trucks and cargo vehicles on the nearby road and internal road may have contributed to the excess Sulphur dioxide and particulate matter. Monitoring of vehicles to be in good exhaust condition and peak hour traffic management will help to keep the environs to comply with the guideline values. Mitigation measures and its EMP are discussed in detail in the following chapters of this Report.

### Air Quality Sampling Result

No.	Parameter	Analyzed Period	Result	Unit	Average Period		WHO Guideline Value	NEQG* Guideline Value	Remark
1	Particulate Matter PM <sub>10</sub>	24-hr	66.92	µg/m <sup>3</sup> µg/m <sup>3</sup>	1 24	Year Hour	-	*20 µg/m <sup>3</sup> *50 µg/m <sup>3</sup>	Above the guideline
2	Particulate Matter PM <sub>2.5</sub>	24-hr	54.11	µg/m <sup>3</sup> µg/m <sup>3</sup>	1 24	Year Hour	25 µg/m <sup>3</sup>	*10 µg/m <sup>3</sup> *25 µg/m <sup>3</sup>	Above the guideline
3	Total Suspended Particulate (TSP)	24-hr	92.3	µg/m <sup>3</sup>	24 Hours		NG	NG	-
4	Sulphur Dioxide (SO <sub>2</sub> )	24-hr	118.84	µg/m <sup>3</sup> µg/m <sup>3</sup>	10 24	Mins Hours	8 ppb	* 500 µg/m <sup>3</sup> * 20 µg/m <sup>3</sup>	Above the guideline
5	Nitrogen Dioxide (NO <sub>2</sub> )	1-hr	42.58	µg/m <sup>3</sup> µg/m <sup>3</sup>	1 1	Year Hour	21 ppb	*40 µg/m <sup>3</sup> *200 µg/m <sup>3</sup>	Under the guideline
6	Carbon Monoxide (CO)	24-hr	0.3	ppm	24 Hours		9 ppm	*150 µg/m <sup>3</sup>	Under the guideline
7	Ozone (O <sub>3</sub> )	8-hr	43.24	µg/m <sup>3</sup>	8 Hours		NG	100 µg/m <sup>3</sup>	Under the guideline
8	Relative Humidity	24-hr	70.85	%	24 Hours		NG	NG	-
9	Temperature	24-hr	30.75	°C	24 Hours		NG	NG	-
10	Air Pressure	24-hr	1011.66	hPa	24 Hours		NG	NG	-
11	Wind Direction	24-hr	204.83	degree	24 Hours		NG	NG	-
12	Wind Speed	24-hr	0.48	m/s	24 Hours		NG	NG	-

\*National Environmental Quality (Emission) Guidelines (2015)

NG=No Guideline

**Figure 21: Air Quality Monitoring Results of Aqua Feed Mill Factory Project, 10 Nov 2021<sup>39</sup>**

**Noise Level:** Although the average noise results does not exceed the guideline value, the maximum dBA (82.2) is above the guideline of 70 dBA for commercial / industrial area. It is analyzed that the noise from the operation of the Boiler at the distance may have contributed to exceed the allowable

<sup>39</sup> Appendix G: Environmental Monitoring Report (Air, Noise, Water Quality)

limit for industrial area. It is also observed that both the Boiler and Generator nearby were running at the same time during monitoring.

No.	Measurement Place	Current activity during monitoring	Noise Level (dBA)			NEQG1 standard	
			Day Time			Residential, Institutional, educational	Industrial, commercial
			Minimum dBA	Maximum dBA	Average dBA		
1	Area between the two production factories	Boiler is operating at the distance	60.2	82.2	66.19	55	70

<sup>1</sup>National Environmental Quality (Emission) Guidelines, 29 Dec 2016

\*Average equivalent for one hour

\*\*Average maximum for one hour

**Figure 22: Noise Level at Aqua Feed Mill Factory Project, 10 Nov 2021**

## 5.4 Infrastructure and Services

### 5.4.1 Water Supply System

For water supply, tube wells are drilled in Hmawbi Township and its villages. The water samples were collected from Aqua Feed Mill Project, De Heus Myanmar Limited. The National Drinking Water Standard and the World Health Organization (WHO) Drinking Water Standard is used as a guideline reference.

**Table 5.6: Ground water quality of Tubewell at Project Site**

Sr. No.	Sample No.	Location	GPS Value
1	AFM No.1	Tube well water of De Heus Myanmar Limited	17°09'27.83"N 95°59'13.52"E
2	AFM No.2	Tube well water of De Heus Myanmar Limited	17°09'25.44"N 95°58'12.00"E
3	AFM No.3	Tube well water at Konekalay Village	17°09'16.46"N 95°58'03.52"E
4	AFM No.4	Surface water of Hlaing River near Konekalay Village	17°09'14.43"N 95°57'56.68"E

### 5.4.2 Drinking Water Quality

The analyzed results are shown in the following table.

**Table 5.7: Analyzed results of water quality**

Characteristics	Drinking Water Standards World Health Organization (WHO)		AFM No.1	AFM No.2	AFM No.3	Remark
	Highest Desirable	Maximum Permissible				
Phsico-chemical	Level	Level				
Turbidity (J.T.U)	5	25.0	105	65	95	Chemically

						potable
Colour(Pt-scale)	5	50.0				
pH	7-8.5	6.5-9.2	6.98	7.10	7.10	
Total solids	500	1500	0.92	0.56	0.80	
Total hardness	100	500	44.00	62	77	
Chloride	200	600	10.64	12.55	14.54	
Sulphide (as So <sub>4</sub> )	200	400	0.48	0.48	0.48	
Fluoride (as F)	1	1.5	-	-	-	
Nitrates (as No <sub>3</sub> )	45	45	-	-	-	
Calcium (as Ca)	75	200	11.22	8.82	12.83	
Magnesium	30	150	3.90	9.76	9.27	
Iron (as Fe)	0.1	1	0.45	0.70	0.04	
Manganese (as Mn)	0.05	0.5	0.000005	0.000	0.000	
Copper	0.05	1	0.000016	0.000053	0.000005	
Zinc	5	15	0.000009	0.000	0.000002	
Phenlic Compounds	0.001	0.002	-	-	-	
Detergents, anionic	0.2	1	-	-	-	
Mineral oil	0.01	0.30	-	-	-	
Arsenic	0.05	0.05	0.000002	0.000	0.000	
Chromium (as Cr <sup>6+</sup> )	-	0.01	0.000005	0.000001	0.000002	
Cyanide	-	0.05	<0.01	<0.01	<0.01	
Lead	-	0.1	0.000001	0.000001	0.000001	
Selenium	-	0.01				
Cadmium	-	0.01	0.000002	0.000	0.000	
Mercury	-	0.001	0.000	0.000	0.000	
PCBS (µg/ L)	-	0.2	-	-	-	
Gross alfa activity(Pci/L)	-	3	-	-	-	
Gross beta activity(Pci/L)	-	30	-	-	-	
EC(µmhos/cm)	-	250-750	1392	126	226	

P.K, Goel, water pollution, Causes, effects and controls

Note: all the values are in mg/l expect pH, otherwise stated.

NTU is a measure of light scattered by a formazin polymer.

Approximately, 1 NTU is equal to 1 JTU.

#### **Sampling Sites:**

Sample AFM No.1 - Tube well water at De Heus Myanmar limited, 300ft (4.6.2019)

Sample AFM No.2 - Tube well water at De Heus Myanmar Limited, 300ft (25.6.2019)

Sample AFM No.3 –Tube well water at Konekalay, Depth 40ft (13.6.2019)

According to analyzed results show that these water samples are chemically potable, water except turbidity. The turbidity in water is actually unsatisfactory. Therefore it is necessary to set up the sedimentation process.

**Table 5.8: Water Quality of Hlaing River (General Guideline)**

Sr. No	Parameter	Unit	Guideline Value	AFM No.4 (Hlaing River)
1	5-days Biological Oxygen Demand	mg/l	50	7.4
2	Arsenic	mg/l	0.1	0.000
3	Chemical Oxygen Demand	mg/l	250	18.4
4	Chromium (total)	mg/l	0.5	0.000004
5	Copper	mg/l	0.5	0.000116
6	Cyanide(total)	mg/l	1	<0.01
7	Iron	mg/l	3.5	0.45
8	Lead	mg/l	0.1	0.000001
9	Mercury	mg/l	0.01	0.000
10	Nickel	mg/l	0.5	0.000001
11	Total suspended solids	mg/l	50	7.28
12	Zinc	mg/l	2	0.000

**Sampling Site:** Sample AFM No.4- Surface water of Hlaing River near Konekalay village (24.6.2019)

According to the analyzed data, the result exists under the guideline limit.73.19.2

#### 5.4.3 Sewerage System

Generally, Hmawbi Township utilizes septic tank system for sanitation facilities. For wastewater treatment, the proposed project will use a bio septic tank with adequate capacity will be installed for safe disposal of the effluent to the nearby water body.

#### 5.4.4 Dam, Weir, Pump Irrigation Projects and Irrigable Area

There are no dams in Hmawbi Township.

#### 5.4.5 Pump Irrigation Projects in Hmawbi Township

**Table 5.9: Pump Irrigation Projects in Hmawbi Township**

Sr.No	Township	Name of Project	Irrigation Area	Marks
1	Hmawbi	Kan Kalay (Am)	450	-
2	Hmawbi	Myaung Takar	215	-
	<b>Total</b>		<b>665</b>	-

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 5.4.6 Embankments and Sluice in Hmawbi Township

**Table 5.10: Embankments and Sluice in Hmawbi Township**

Sr. No	Township	Embankments and Sluice			Preventing River/Creek	Acres
		Name	Types	Length		
1	Hmawbi	Dun Tan Pae	Flood Prevention	17 miles	Hlaing River	7100

2	Hmawbi	Tayet Chaung	Flood Prevention	5.3 miles	Hlaing River	2540
	<b>Total</b>					<b>9640</b>

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 5.4.7 Transportation

##### (a) Airway

There is no airway in Hmawbi Township.

##### (b) Waterway

*Table 5.11: Waterway in Hmawbi Township*

Sr. No.	Name of Waterway	Township		Mile	Number of Harbour	
		From	To		Harbour	Other
1	Hlaing River	Myit Kyo	Yay Por Tae	18	-	-

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

##### (c) Railway in Hmawbi Township

*Table 5.12: Railway in Hmawbi Township*

Sr. No.	Name of Railway	Township		Mile	Number of Railway Station	
		From	To		Big	Small
1	Yangon-Pyay	Moe Kyo Pyit	Phoo Gyi	29	1	3

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

##### d) Roads in Hmawbi Township

*Table 5.13: Roads in Hmawbi Township*

Sr. No.	Road	Types of Road	Mile
1	Hmawbi-Htan Ta Pin	Asphalt	5 miles 2 furlong
2	Shwe Mya Yar Kone-Phoo Gyi- Yin Kwal Taung Lan	Asphalt	7 miles 1 furlong
3	Yay Twin Kone- Myo Chaung Lan	Asphalt	2 miles 5 furlong
4	Yangon- Pyay	Asphalt	22 miles 3 furlong
5	No (4) Road	Asphalt	6 miles 4 furlong

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

##### (e) Bus Terminal

*Table 5.14: Bus Terminal in Hmawbi Township*



Sr. No.	Township	Bus Terminal	Bus Routes	Type of Bus	Numbers of Bus
1	Hmawbi	No(37)	GTU - Sulay	YBS	38
2	Hmawbi	No(41) No(41) No (90)	Hmawbi Market -Thakhin Mya Park	City Bus Mini Bus Express	37 41 40
3	Hmawbi	No(91)	Insein Park - Hmawbi Market	Mini Bus	35
4	Hmawbi	No (96)	GTU - Hlawgar	YBS	8
<b>Total</b>				<b>4</b>	<b>159</b>

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 5.4.8 Bridges

##### (f) Bridges over 180 ft

*Table 5.15: Bridges over 180 ft in Hmawbi Township*

Sr. No.	Township	Bridge Name	Length (ft)	Type	Year	Types of Vehicle that can pass
1	Hmawbi	Myo Chaung	1940	R.C.C	15.1.1999	Cars

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

##### (g) Bridge under 180 ft

*Table 5.16: Bridges under 180ft in Hmawbi Township*

Sr. No	Name of Bridges(between 50ft and 180ft)	Length	Type	Year	Types of Vehicle that can pass	No of bridges under 50ft
1	Hmawbi Market Bridge	60	R.C.C	1980	Cars	113
2	Myoung Bridge Chaung Wa Bridge	112	R.C.C	1980	Cars	

#### 4.5.9 Hotel and Tourism Enterprise

*Table 5.17: Hotel, Motel, Guest House in Hmawbi Township*

Sr. No.	Township	Number of Motel	Government/ Private	Number of Rooms	Number of Guest House
1	Hmawbi	IR	Private	23	-
2	Hmawbi	-	-	-	13

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 4.5.10 Market and Supermarkets

*Table 5.18 Markets in Hmawbi Township*

Sr. No.	Name of Market	Numbers of Shop	Location	Government/ Private
1	Myo Ma Market	876	No (3) Quarter	Government
2	Myaung Takar Market	94	Myaung Takar	Government
3	Warr Net Chaung Market	93	War Net Chaung	Government

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 4.5.11 Banks in Hmawbi Township

*Table 5.19 Banks in Hmawbi Township*

Sr. No.	Township	Names of Banks	Location	Government/ Private
1	Hmawbi	Myanmar Economic Bank	Tat Kyi Kone	Government
2	Hmawbi	Myanmar Agriculture Bank	Quarter (1)	Government
3	Hmawbi	AYA	Quarter (4)	Private
4	Hmawbi	CB	Quarter(2)	Private
5	Hmawbi	KBZ	Quarter (3)	Private
6	Hmawbi	GTB	Quarter (4)	Private

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 4.5.12 Stores and Shops in Hmawbi Township

*Table 5.20 Stores and Shops in Hmawbi Township*

Sr. No.	Types of Shops	Number
1	Store	20
2	Goldsmith	4
3	Electronic Accessories	16
4	Phone/ Phone Accessories	17
5	Book Shops	1
6	Pharmacy	10
7	Restaurant	31
8	Tea Shop	39
9	Hardware Shop	94
10	Agricultural Shop	3
11	Construction Shop	14
12	Service Center	1
13	Rice Shop	10
14	Clothing Shop	15
15	Nirvana	3
	<b>Total</b>	<b>278</b>

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 4.5.13 Municipal Enterprise

*Table 5.21 Market Enterprise*

Sr. No.	Name of Market	Number of Room	Government/ Private	Location
1	Myo Ma Market	876	Government	Yangon-Pyay Road, Quarter (3) Hmawbi Township.
2	Myaung Dakar Market	93	Government	Yangon- Pyay Road, Myaung Dakar San Pya Village
3	War Net Chaung Market	94	Government	War Net Chaung Village
	<b>Total</b>	<b>1063</b>		

Source: [www.yangon.gov.mm](http://www.yangon.gov.mm)

#### 4.5.14 Energy and Electricity Supply

##### (a) Petro, Diesel Stations

*Table 5.22: Energy and Electricity Supply*

Sr. No	Shop Names	Government/ Private	Selling per Year		
			Petrol	Diesel	Total
1	Taw Win	Private	335384	568444	904828
2	Shwe Zin Yaw	Private	-	4015	4015
3	Top Point	Private	4660	3718	8378
4	Max	Private	470914	524804	995718
5	Star High	Private	143608	84104	227712
6	Min Mahar	Private	-	37953	37953
7	Kyaw San	Private	76348	136893	213241
8	PT Power	Private	248820.311	144076	392896.363
	<b>Total</b>		<b>1279734</b>	<b>1504007</b>	<b>2783741</b>

##### (b) Natural Gas Station

*Table 5.23: Natural Gas Station in Hmawbi Township*

Sr.No	Name	Government/ Private	Selling Cubic feet per year
1	042/ Htauk Kyant	Government	341000000

### 5.5 Socio-Economic Component and Public Administration<sup>40</sup>

#### 5.5.1 Population

The project area is in Hmawbi Township, which has a population of 202904 in 2019. This includes 70.4% for above 18 years and 29.6% under 18 years. The number of household is 46937 and on the assumption that one family comprises of 4.3 members in average. The ratio of male and female is 1:1.1 and the rate of population increase is 4.96% as of 2019 September. The ethnicity data is as described below:

<sup>40</sup> Hmawbi Township Administrative Report, 2019

**Table 5.24: Ethnicity Data, Hmawbi Township**

Ethnicity/ Township	Kachin	Kayah	Kayin	Chin	Mon	Bamar	Rakhine	Shan	Other	Total
Hmawbi	388	2120	17524	1605	340	17524	981	2198	-	202904
%	0.19	1.04	8.63	0.79	0.16	86.83	0.48	1.08	-	21.03

**Table 5.25: Hmawbi Township Urban and Rural Household Status**

Sr. No.	Description	Number of Houses	Household	Number of Quarter	Village tract	Villages
1	Urban	5925	5959	4	-	-
2	Rual	38062	40978	-	39	195
	<b>Total</b>	<b>43987</b>	<b>46937</b>	<b>4</b>	<b>39</b>	<b>195</b>

**Table 5.26: Hmawbi Township Male and Female Population (Male 47.91%, Female 52.09%)**

Sr. No	Description	Above 18 years of Age			Below 18 years of Age			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Urban	20215	10092	20307	2832	3213	6045	13047	13305	26352
2	Rural	57410	65117	122527	26756	27269	54025	84166	92386	176552
	<b>Total</b>	<b>67625</b>	<b>75209</b>	<b>142834</b>	<b>29588</b>	<b>30482</b>	<b>60070</b>	<b>97213</b>	<b>105691</b>	<b>202904</b>
	<b>%</b>	<b>47.35</b>	<b>52.65</b>	<b>70.39</b>	<b>49.26</b>	<b>50.74</b>	<b>29.61</b>	<b>47.91</b>	<b>52.09</b>	<b>100</b>

#### 5.5.2 Land Use Statistics

**Table 5.27: Land Utilization in Hmawbi Township**

Sr. No.	Description	Area (acres)	Percentage
<b>1</b>	<b>Net Sown Area</b>	<b>63272</b>	<b>53.79</b>
	(1) Paddy Land	1544	
	(2) Upland	-	
	(3) Alluvial Land	-	
	(4) Garden Land	-	
	(5) Hilly Upland	-	
<b>2</b>	<b>Unsown Land</b>	<b>-</b>	<b>-</b>
	(1) Paddy Land	-	
	(2) Upland	-	
	(3) Alluvial Land	-	
	(4) Garden Land	-	
	(5) Hilly Upland	-	
<b>3</b>	<b>Pasture Land</b>	<b>5695</b>	<b>4.85</b>
<b>4</b>	<b>Industrial Land</b>	<b>4115</b>	<b>3.50</b>

5	Urban	1193	1.02
6	Rural	3450	2.93
6	Reserved and Protected Area	630	0.56
7	Jungle Land	-	-
8	Bare Land	4621	3.94
9	Uncultivable Land	33099	28.14
TOTAL		117619	100

### 5.5.3 Agricultural Production

#### (a) Ten Major Crop Productions

*Table 5.28: major crop production*

Sr.No	Crop	2018-2019			
		Sown	Harvested	Yield per acre	Yield (Basket)
1	Paddy (Summer)	3219	3219	81.2	-
2	Paddy (Moonsoon)	45436	45436	88.1	310927
3	Groundnut (Winter)	285	285	63.31	-
4	Sesame (Moonsoon)	-	-	-	-
5	Sesame (Winter)	-	-	-	-
6	Sunflower	-	-	-	-
7	Black gram	1530	390	14.92	5820
8	Green gram (Moonsoon)	-	-	-	-
	Green gram (Winter)	68	68	12.18	242
9	Pigeon	-	-	-	-
10	Cotton	-	-	-	-
11	Sugarcane	-	-	-	-
12	Removing Seed Corn	-	-	-	-

#### (b) Long term crop production at Hmawbi Township

*Table 5.29: Long term crop production in Hmawbi Township*

Sr.No	Crop	Sown	Harvested	Yield per acre	Yield (basket)
1	Rubber	2253	-	-	-
	Total	2253	-	-	-

### 5.5.4 Livestock Breeding Status

*Table 5.30: Livestock Breeding Zone*

Sr. No	Zone Name	Types and numbers of animals							
		Buffalo	Beef	Sheep	Goat	Pork	Chicken	Duck	Quail

1	Nyaung Na Pin Livestock breeding zone(1)	-	96	-	150	-	684200	10000	-
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#### 5.5.5 Township Livestock Breeding

*Table 5.31: Township Livestock Breeding*

Sr. No	Year	Buffalo	Beef	Pork	Sheep/Goat	Chicken	Duck	Quail
1	2018 - 2019	5446	14710	41166	1361	1665251	42010	754900

#### 5.5.6 Meat Production at Hmawbi Township

*Table 5.32: Meat Production at Hmawbi Township*

Sr. No	Year	Buffalo	Beef	Pork	Sheep/Goat	Chicken	Duck	Quail
1	2018 - 2019	57305	151110	443840	12264	3140825	151475	-

#### 5.5.7 Eggs productions at Hmawbi Township

*Table 5.33: Eggs Production at Hmawbi Township*

Sr. No	Township	Year	Chicken	Duck	Quail
1	Hmawbi	2018 - 2019	61198455	4551550	-
	<b>Total</b>		<b>61198455</b>	<b>4551550</b>	<b>-</b>

#### 5.5.8 Dairy Production in Hmawbi Township

*Table 5.34: Dairy Production at Hmawbi Township*

Sr.No	Township	Year	Number of Cow	Production (Viss)
1	Hmawbi	2018 - 2019	3795	1186615
	<b>Total</b>		<b>3795</b>	<b>1186615</b>

#### 5.5.9 Fish and Prawn at Hmawbi Township

*Table 5.35: Fish and Prawn at Hmawbi Township*

Sr. No	Year	Fish			Prawn		
		Number of pond	Acre	Production	Number of pond	Acre	Production
1	2018 - 2019	68	330.98	13.18	-	-	-

#### 5.5.10 Industries

##### (a) Industrial Zone

*Table 5.36: Industrial Zone, Hmawbi Township*

Sr. No	Name of Zone	Name of Factory	Products
1	Myaung Dakar Industrial Zone	Threat and Clothig Factory	Textiles
2	Myaung Dakar Industrial Zone	Metal and Mineral Industry	Alluminum pot
3	Myaung Dakar Industrial Zone	Food Industry	Noddle/ Biscuit
4	Myaung Dakar Industrial Zone	Chemical and other similar factory	Candle



5	Myaung Dakar Industrial Zone	Paper and printing services	Books
6	Myaung Dakar Industrial Zone	Wood and Ceramic Factory	Tables/ Chairs
7	Myaung Dakar Industrial Zone	General Factory	-

**(b) Factories in Hmawbi Township**

*Table 5.37: Factories in Hmawbi Township*

Sr. No	Name of Factory	Types	Government/ Private	Labour Strength
1	Yangon Crown	Iron Melting and Iron filigree	Private	401
2	Aung Universal	Iron Melting and Iron filigree	Private	166
3	Soe Moe Khaing	Iron Melting and Iron filigree	Private	210
4	999	Iron Melting and Iron filigree	Private	129
5	Shwe Baho	Iron Melting and Iron filigree	Private	38
6	Yaxin	Iron Melting and Iron filigree	Private	242
7	Yaxin (2)	Iron Melting and Iron filigree	Private	78
8	Sky Men	Iron Melting and Iron filigree	Private	54
9	Han Steel Power	Iron Melting and Iron filigree	Private	99
10	Cung Ling Phone	Iron Melting and Iron filigree	Private	286
11	Myanmar Typical	Iron Melting and Iron filigree	Private	278
12	Yangon Maxtay	Iron Melting and Iron filigree	Private	241
13	IK	Iron Melting and Iron filigree	Private	82
14	Sunshine	Iron Melting and Iron filigree	Private	15
15	Wai Phyo Aung	Iron Melting and Iron filigree	Private	5
16	666	Temporary Closed	Private	12
17	Myanmar Sumbell	Iron Melting and Iron filigree	Private	95
18	Myanmar Smelting	Iron Melting and Iron filigree	Private	185
19	Ba An	Iron Melting and Iron filigree	Private	68
20	Gado Sky Man	Iron Melting and Iron filigree	Private	66
21	Win Star	Iron Melting and Iron filigree	Private	20
22	Myanmar Giant Metal	Iron Melting and	Private	108

		Iron filigree		
23	Aluminum Structure	Iron Melting and Iron filigree	Private	44
24	Khin Maung Nyunt Steel Product Galvanizing	Iron Melting and Iron filigree	Private	39
25	U Khin Than	Iron Melting and Pouring	Private	5
26	U Aung Kyaw Oo	Iron Melting and Pouring	Private	8
27	U Maung Ba	Iron Melting and Pouring	Private	2
28	U Ong Than	Iron Melting and Pouring	Private	3
29	U Aung Naing	Iron Melting and Pouring	Private	18
30	U Moe Kyaw	Iron Melting and Pouring	Private	8
31	Daw Tin Tin Myint	Iron Melting and Pouring	Private	2
32	U Kyaw Thu	Iron Melting and Pouring	Private	7
33	U Aung Thein	Iron Melting and Pouring	Private	4
34	C –J Feed	Animal Feeds	Private	124
35	Japfa	Animal Feeds	Private	300
36	Deheus	Animal Feeds	Private	87
37	Myit Da Chan	Animal Feeds	Private	55
38	Belga	Peeps	Private	29
39	Phin Shin	Plastic	Private	5
40	Popular	Plastic	Private	56
41	Tiger Asia	Plastic	Private	51
42	Recycles	Plastic	Private	21
43	Dahua	Plastic	Private	162
44	Follow Me	Fan	Private	12
45	Shwe Sin Tun	Fan	Private	46
46	U Sit Nyein Tun	Fan	Private	9
47	Textile Place	Sewing	Private	1823
48	A & C	Sewing	Private	1017
49	Ton Gyin HK	Sewing	Private	419
50	Myanmar Ta Kaung	Sewing	Private	345
51	San Hee	Tissue	Private	37
52	V- Top	Doll Factory	Private	36
53	Z- Men	Sewing	Private	50
54	Daw Phyu Phyu Win	Piping	Private	7
55	U Khin Soe	Piping	Private	4
56	U Than Lwin	Battery	Private	3
57	Daw Tin Tin Khin	Plate	Private	6
58	Nuri Chemical	Liquid Soap Oil	Private	13
59	TK	Battery	Private	5
	<b>Total</b>			<b>8060</b>

**(c) Workshops in Hmawbi Township**

*Table 5.38: Workshops in Hmawbi Township*

Sr. No	Name of Workshop	Types	Government/ Private	Labour Strength
1	MANI Yangon Limited	Yarn	Private	194
2	Kido Yangon Co., Ltd	Jakin	Private	1610
3	Wan He Garment Factory		Private	4253

4	Japfa Comfeed Myanmar	Eggs	Private	141
5	Japfa Comfeed Myanmar	Peeps	Private	117
6	Bolly Hongkong Co., Ltd	Footwear	Private	485
7	Lotte MGS Beverage Co., Ltd	Purified Water/ Soft Drink	Private	169
8	Coca Cola Pinya Beverage Myanmar Co., Ltd	Purified Water/ Soft Drink	Private	1269
9	Khein KEN Myanmar Limited	Beer	Private	109
10	Myanmar Wide	Garment	Private	1150
11	Myanmar Hua Yue Garment	Garment	Private	423
12	Su Yu Ei Co., Ltd	Garment	Private	1041
13	Myanmar SMC	Garment	Private	580
14	Gold Empire Myanmar Co., Ltd	Lens, Cameras, Bags	Private	792
15	CNM Garment Factory	Garment	Private	315
16	Natural Clay	Porcelain and Earthware	Private	180
17	J C B	Box (paper)	Private	255
18	Kaung Htet Livestocks and Feed Mill	Animal Feeds	Private	117
19	New General Industry	Plastic	Private	163
20	Loi Hein Co., Ltd Alpine Drinking Water	Purified Water/ Soft Drink	Private	522
21	Textile Place Co., Ltd	Garment	Private	1641
<b>Total</b>				<b>15526</b>

**(d) Cottage Industries in Hmawbi Township**

*Table 5.39: Cottage Industries in Hmawbi Township*

Sr.No	Types	Number	Labour Strength
1	Sewing	130	150
2	Gold Smith	15	50
3	Black Smith	-	-
4	Food	30	40
5	Jute Rope	-	-
<b>Total</b>		<b>175</b>	<b>240</b>

**5.5.11 Economy**

The Gross Domestic Product (GDP) structure of Hmawbi Township, Yangon Township is as shown in the following table:

**(a) Income per Capita**

**Table 5.40: Gross Domestic Product (GDP) of Hmawbi Township**

Sr. No.	Sector	Plan 2017-2018	Plan 2018-2019	GDP, 2018-2019 (Million Kyat)		
				Value	Implement	Progress (%)
1	Product Value	274356.7	205722.6	2057222.6	79.2	8.6
2	Services Value	66445.0	74328.6	74328.6	80.7	14.9
3	Trade Value	112067.2	83341.3	83341.3	77.7	3.5
4	GDP	452868.9	363392.5	363392.5	79.1	8.6

**(b) Per Capita Income in Hmawbi Township**

**Table 5.41: Per Capita Income in Hmawbi Township**

Sr. No.	Township	2016-2017	2017-2018	2018-2019
1	Hmawbi	1560999	1781819	-

**(c) Livelihoods**

**Table 5.42: Unemployment Rate**

Sr. No.	Township	Number of Persons who can work	Number of Workers	Unemployed persons	Unemployment rate (%)
1	Hmawbi	142834	119473	23361	19.55 %

**(d) Vocational Activities**

The livelihood status at Hmawbi Township is as shown in below table:

**Table 5.43: Livelihood of Hmawbi Township**

Sr. No	Government staff	Services	Agriculture	Livestock Breeding	Sales	Industrial	Fishery	Merchant	Other	Total
1	2329	-	40000	35000	14000	10000	100	8000	33361	142834

**5.6 Public Health and Educational Component**

**5.6.1 Health Status**

**(a) Hospitals**

**Table 5.44: Hospitals and Health care centers in Hmawbi Township**

Sr. No.	Hospital	Government/ Private	Numbers of Beds
1	Hmawbi Hospital	Government	50
2	Phoo Gyi Cottage Hospital	Government	16
3	War Net Chaung Cottage Hospital	Government	16

**(b) Healthcare Hospitals and Clinics**

**Table 5.45: Hospital in Hmawbi Township**

Sr. No.	Hospital	Government/ Private	Type of Diseases
1.	Township Health Department	Government	General

2	Sub Department (1)	Government	General
3	Sub Department(2)	Government	General

(c) Clinics

*Table 5.46: Clinic in Hmawbi Township*

Sr. No	Township	Clinics			Rural Health Department	Sub- rural health Department
		Government	Private	Total		
1	Hmawbi	5	-	5	5	30

(d) Common Disease

*Table 5.47: Common diseases that affect inhabitants at Hmawbi Township*

Sr. No	Township	Type of Disease									
		Malaria		Diarrhea		Tuberculosis		Dysentery		Liver Syros's	
		Cause	Death	Cause	Death	Cause	Death	Cause	Death	Cause	Death
1.	Hmawbi	4	-	1111	-	361	-	100	-	-	-

(e) HIV/AIDS Disease cause/death affect inhabitants in Hmawbi Township

*Table 5.48: HIV/ AIDS Disease cause/ death affect inhabitants in Hmawbi Township*

Sr. No.	2017 - 2018		2018 - 2019	
	Cause	Death	Cause	Death
1	13	-	128	3

(f) Healthcare Personnel

*Table 5.49: Health Care Personnel at Hmawbi Township*

Sr. No	Township	Population	Doctor's Care		Nurse Health Care		Assistant Health officer	Assistant Health Officer/ Patient
			Doctor	Rate of Doctor/ Patient	Nurse	Rate of Nurse/ Patient		
1	Hmawbi	202904	12	1:16908	27	1:7514	6	1:33817

(g) Health Index

*Table 5.50: Birth Rate and Mortality Rate of Mother and Child, Hmawbi Township*

Township	Number of Mothers	Number of Childs	Rate per 1000 Person			
			Birth Rate	Mortality rate of mother	Mortality rate of baby	Rate of miscarriage
Hmawbi	4346	4097	17	1.0	4.0	5.2

(h) Population Rate and Male/ Female Ratio

*Table 5.51: Population rate and male/ female ratio between 2018 and 2019*

Sr. No.	Population (Recent year)	Population (Current)	Additional Population	Addition Rate	Male/ Female Ratio		
					Male	Female	Ratio

1	194160	202904	8744	4.96	97213	105691	1:1.1
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### 5.6.2 Educational Status

*Table 5.52: School Status of Hmawbi Township*

Sr. No.	Hmawbi Township	Higher Education	High School	Sub-High School	Middle School	Sub-Middle School	Pre-Primary School	Primary School	Post Primary School	Monastic Education
		University								
1	Number of Institution	1	10	4	3	3	-	95	28	8
2	Number of Students	3077	18734	3407	1147	2117	-	15076	9110	1773
3	Number of Teachers	224	471	119	34	54	-	306	269	71
4	Teacher and Student Ratio	1:13	1:39	1:28	1:33	1:39	-	1:49	1:33	1:24

### 5.7 Social, Religious and Cultural Environment

#### 5.7.1 Social Organizations

There are some NGOs (Non-Governmental Organizations) and Social Organization established within the Hmawbi Township.

#### INGOs (International Non-Governmental Organization) and NGOs at Hmawbi Township

*Table 5.53: INGO*

Sr. No.	Name of INGO	Office/ Location	Enterprise
1	World Vision	Quarter (2)	Education/ Health

#### NGO

*Table 5.54: NGO*

Sr. No.	Women's Organization	Women and Children Organization	Myanmar Veterans' Organization	Myanmar Red Cross Society	Myanmar Fire Brigade	Total
1	24560	40003	2400	300	1120	68383

### 5.8 Visual Components and Amenities

#### 5.8.1 Sports and Recreation Centers:

*Table 5.55: Sports and Recreation Centers in Hmawbi Township*

Sr.No.	Sports						Recreation		
	Football	Volleyball	Basketball	Tennis	Golf	Other	Cinema	Park	Other
1	1	-	-	-	-	-	1	1	-

#### 5.8.2 Language and Religion

The most common language used is Bahmaand other ethnic languages such as Chin, Kayin, Kachin, Shan, Mon and Rakhine are also spoken within the respective ethnic groups in Hmawbi Township.

#### 5.8.3 Religious Activities

*Table 5.56: Religion at Hmawbi Township*

Sr. No	Description	Buddhist	Christian	Hindu	Islam	Other	Total
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1	Hmawbi	185700	14247	656	2301	-	202904
<b>% Percentage</b>		91.52	7.02	0.32	1.14	-	100

### 5.8.3 Foreigners Living

*Table 5.57: Foreigner Living in Hmawbi Township*

Sr. No.	Foreigner	Living Person	Number of Person in Urban	Percentage
1	Chinese	307	202904	0.15
2	India	2221	202904	1.09
3	Pakistan	30	202904	0.01
4	Bangladesh	535	202904	0.26
5	Other	30	202904	0.01
	<b>Total</b>	<b>3123</b>	202904	<b>1.53</b>

### 5.8.4 Religious Buildings

*Table 5.58: Number of Pagodas, Monasteries, Monks, Nuns*

Sr. No.	Township	Pagoda	Monastery	No. of the Sangha			
				Monk	Novice	Nun	Total
1	Hmawbi	2	456	2776	2256	740	5032

*Table 5.59: Number of Other Religious Buildings*

Sr. No.	Township	Church		Mosque		Hindu Temple		Chinese Temple/ Joss-house	
		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
1	Hmawbi	4	36	2	5	2	-	-	-

### 5.8.5 Archaeological Structure of Hmawbi Township

There is no archaeological structure near Hmawbi Township.

## 5.9 Overall Socio Economic Context of Proposed Project Area

Since the project site lies within the Myaung Dagar Industrial Zone Area, there is no human settlement in the area. The nearest human habitation is observed in the indirect affected areas of nearby two villages, Area of Influence (AOI) about 2-5 miles at the west and south east of the project site<sup>41</sup>: a) Kone Ka Lay village; and b) Kan Ka Lay village, of which a socio-economic survey was carried out in 14 households with 64 persons<sup>42</sup>.

A socio-economic survey of project area in Myaung Dagar was carried out during June 2019 and duly update during Nov 2021. The findings from these Household and Ward surveys are described as follows:

<sup>41</sup> Figure 1: Project Site Location Map of Aquafeed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi TS, Yangon Region

<sup>42</sup> Appendix D : Socio-Economic Survey Questionnaire and Interviewed Responses

### 5.9.1 Wards / Hmawbi Township

- Population
- Livelihood
- Communication
- Infrastructure: Existing water supply and sanitation condition
- Religious and Cultural Heritage

The Wards in Hmawbi Township are representative of the township area that are mentioned in the previous sections of Baseline data.

### 5.9.2 Households

- Household particulars
- Income and Expenditure
- Challenges regarding livelihood
- Solution to problem
- Comment on proposed Aqua feed mill project

The majority of the households and wards interviewed have no objection to the proposed project. The summary of the social survey is described below:

**Questionnaires for Household data of Indirect Affected Area**

Name	Q1												
	Household Particular												
	Occupation								Education				
	Farmer/ Agriculture	Livestock	Casual Labour	Selling	Government Staff	Private Staff	Student	Dependent	Primary	Secondary	High School	Educated	Never been to school
Indirect Affected Area	6	3	5	3	2	9	21	15	27	16	15	4	2

Name	Q 4								
	Housing				Implements		Home Property		
	Bamboo-Thatch	Bamboo-CGI	Timber-CGI	Brick-Concrete	Bicycle	Motor bike	TV	Radio	Other
Indirect Affected Area	1	5	7	1	5	11	8	3	2

Name	Q6					Q7				
	Livestock					Drinking Water				
	Cow	Goat	Duck	Chicken	Pig	River/ Stream	Open Well	Lake	Tube Well	Pipe Line
Indirect Affected Area	4	10	45	40	6	-	1	-	13	-

#### Questionnaires for Household data of Indirect Affected Area

Name	Q-10				Q-9				
	Type of Toilet				Electricity				
	Flush toilet	Pour flush toilet	Double vault compost latrine	Any-where	24 hour	12 hour	6 hour	3 hour	None
Indirect Affected Area	-	14	-	-	-	-	-	-	14

Name	Q-13		
	Do you agree/ Any comment on this project		
	Yes		No
Indirect Affected Area	14		-

Both Kone Ka Lay and Kan Ka Lay villages do not yet enjoy electricity. They use batteries, flash light and fire-wood to lighten their homes. Most of the inhabitants in these indirect affected areas are simple villagers with livelihood of growing crops such as paddy and betel nut. Others have livestock breeding such as chicken, ducks and pigs; while some others are casual labors, government and private staff, students and dependents.

For water supply, the households have tube wells and open well. For sanitation, they use flush toilets. All of the fourteen households interviewed agreed to the proposed project "Aquafeed Mill Factory Project" in Myaung Da Gar Industrial Zone, Hmawbi Township, Yangon Region.

## 6. Potential Impact, Risk Assessment and Proposed Mitigation Measures

### 6.1 Impact and Risk Assessment Methodology

Environmental and social impact assessment was carried out in a systematic manner, according to the construction and operational phases and seeking to identify any negative impacts that may be “significant” from an ecological, socio-economic or cultural perspective. The assessment is summarized below with positive impacts denoted by green shading.

### 6.2 Impact Assessment and Risk Identification

**Table 6.1: Summary Impact Assessment Matrix for Aqua Feed Mill Factory Project**

Construction Phase			Operational Phase		
Ref.	Impact/Issue	Significance	Ref.	Impact/Issue	Significance
<b>Bio-Physical &amp; Chemical</b>			<b>Bio-Physical &amp; Chemical</b>		
BPC/1	Changes in surface water quality	low	BPC/1	Changes in surface water quality	low
BPC/2	Changes in groundwater quality	low	BPC/2	Changes in groundwater quality	low
BPC/3	Changes to drainage patterns	low	BPC/3	Changes to drainage patterns	low
BPC/4	Changes in rates of erosion and siltation	low	BPC/4	Risk of Soil erosion and siltation	low
BPC/5	Changes to air quality	medium	BPC/5	Changes to air quality	medium
BPC/6	Changes to ambient noise levels	medium	BPC/6	Changes to ambient noise levels	medium
BPC/7	Changes to aquatic biota	low	BPC/7	Changes to aquatic biota	low
BPC/8	Changes to terrestrial biota	low	BPC/8	Changes to terrestrial biota	low
BPC/9	Changes to disease vector populations	low	BPC/9	Changes to disease vector populations	medium
BPC/10	Changes to land cover	medium	BPC/10	Changes to land cover	low
BPC/11	Changes in natural heritage site	low	BPC/11	Changes in natural heritage site	low
BPC/12	Changes to areas of natural habitat	low	BPC/12	Changes to areas of natural habitat	low
<b>Socio-Economic &amp; Cultural</b>			<b>Socio-Economic &amp; Cultural</b>		
SEC/1	Changes involving loss of private assets	low	SEC/1	Changes involving loss of private assets	low
SEC/2	Changes involving loss of cultural heritage	low	SEC/2	Changes involving loss of cultural heritage	low
SEC/3	Changes involving displacement of people	low	SEC/3	Changes involving displacement of people	low
SEC/4	Changes to local traffic patterns	medium	SEC/4	Changes to local traffic patterns	medium
SEC/5	Changes to fisheries	low	SEC/5	Changes to fisheries	low
SEC/6	Changes in local wage labour incomes/livelihood opportunities	medium	SEC/6	Changes in local wage labour incomes/livelihood opportunities	medium

SEC/7	Changes in local trade/commercial incomes/opportunities	low	SEC/7	Changes in local trade/commercial incomes/opportunities	medium
SEC/8	Changes in visual amenity	low	SEC/8	Changes in visual amenity	low
SEC/9	Changes to public infrastructure/community resources	low	SEC/9	Changes to public infrastructure/community resources	low

*Table 6.2: Guidance for impact assessment of proposed project*

Score	Extent	Duration	Magnitude	Probability
1	On site: Within the works/site area or immediate surroundings	Short: The impact is	Low: No environmental functions and processes are altered	Low
		short term (0-12 months) or intermittent	No or minimal change to socio-economic condition	
2	Locally: Effects measurable/noticeable outside the works area and immediate surroundings	Medium: Medium term (1-2 years - construction phase)	Medium: Natural ecosystems are modified	Medium
			Changes are experienced to socio-economic condition	
3	Beyond: The activity has impact outside the project area	Long: the impact persists beyond the construction phase for years or the operational life of the project	High: Environmental functions altered	High
			Socio-economic conditions highly modified	
			Effects may be permanent or irreversible.	

Based on the scores related to extent, duration, magnitude and probability of a specific impact, the significance of the impact is expressed as an indicator given by:

$$\text{Significance indicator} = (\text{Extent} + \text{Duration} + \text{Probability}) \times \text{Magnitude}$$

Impacts are negative unless indicated with (green) shading in the impact matrix.

**Table 6.3: Impact Assessment Matrix during Operational Phase, Aqua Feed Mill Factory Project**

OPERATIONAL PHASE IMPACTS for Environmental and Social Impact Assessment of Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon							
Green for positive impact			score 1, 2 or 3	score 1, 2 or 3	score 1, 2 or 3	score 1, 2 or 3	
Ref.	Impact/Issue	Comment/Description of Impact	Extent	Duration	Magnitude/ Intensity	Probability	Significance
<b>Bio-Physical &amp; Chemical</b>							
BPC/1	Changes in surface water quality	Risk of some changes in water quality at nearby water body	2	3	1	2	low
BPC/2	Changes in groundwater quality	No significant potential pollution to ground water sources	2	3	1	2	low
BPC/3	Changes to drainage patterns	Some drainage pattern change may occur due to new infrastructure	2	3	1	2	low
BPC/4	Changes in rates of erosion and siltation	No risk of Soil erosion and siltation	1	3	1	2	low
BPC/5	Changes to air quality	Some changes in Air Quality may occur due to fine particulate matter and dust potential odor during operation	2	3	2	2	medium
BPC/6	Changes to ambient noise levels	Some change in Noise Level may happen due to the sound of botler operation	2	3	2	2	medium
BPC/7	Changes to aquatic biota	No significant changes in Aquatic biota	1	3	1	2	low
BPC/8	Changes to terrestrial biota	Changes to terrestrial biota	1	3	1	2	low
BPC/9	Changes to disease vector populations	Health risk	2	3	2	2	medium
BPC/10	Changes to land cover	No further land cover change during operational phase	1	3	1	2	low
BPC/11	Change in natural heritage	No change in natural heritage after consturction work	0	0	0	0	low
BPC/12	Changes to areas of natural habitat	No further significant impact in project area	1	3	1	2	low
<b>Socio-Economic &amp; Cultural</b>							
SEC/1	Changes involving loss of private assets	No potential impact	0	0	0	0	low
SEC/2	Changes involving loss of cultural heritage	No impact in operational phase.	0	0	0	0	low
SEC/3	Changes involving displacement of people	No potential social impact	0	0	0	0	low
SEC/4	Changes to local traffic patterns	No potential changes in traffic patterns	3	3	1	3	medium
SEC/5	Changes to fisheries	No changes to fisheries	0	3	0	0	low
SEC/6	Changes in local wage labour incomes/livelihood opportunities	Possibility of Increased income and livelihood opportunities due to the project.	3	3	1	3	medium
SEC/7	Changes in local trade/commercial incomes/opportunities	Possibility of Increased income and livelihood opportunities due to the project.	3	3	1	3	medium
SEC/8	Changes in visual amenity	Enhanced infrastructure appears with natural landscape.	2	3	1	3	low
SEC/9	Changes to public infrastructure/community resources	Expected infrastructure development	2	3	1	2	low



### 6.3 Environmental Risk Assessment and Hazard Management

**Hazard** is the presence of a material or condition that has the potential for causing loss or harm, while **Risk** on the other hand is defined as a combination of the severity of consequences and likelihood of occurrence of undesired outcomes. In other words, risk is the likelihood that, harm or injury from a hazard will occur to specific individuals or groups exposed to a hazard. Thus, for every system or process, there are associated risks and hazards no matter how well managed the system is. Hazards and Risks related to any system / process is defined as a) Occupational; b) Environmental; c) Food safety; and d) Public Health.

As part of this EIA an environmental risk assessment (ERA) was carried out to determine the level of potential risk of significant pollution from the operational activities of the project (i.e. pollution levels that may risk or cause harm to humans or other biota). The risk assessment rating system is applied to the activities selected in order to determine a risk “value”.

#### 6.3.1 Risk Component Variables

The risk evaluation system takes into consideration the following primary variables:

1. Frequency of the potentially risk bearing activities
2. Probability of the event occurring
3. Impacts on environment resulting from the event
4. Effects of event on operation
5. Containment probability of the event
6. Toxicity/Lethality of the release
7. Interest/Sensitivity of the event

The assessment also considers exposure, severity, and public interest factors, which is to assign an equally distributed set of values to each factor and multiply the factors together to arrive at a single Risk Value (R), between 0 and 14. The values are based on pre-defined tables that have a range of values, based on the scenario and circumstances.

#### 6.3.2 Risk Classification

Risk value scores are grouped into different categories in order to determine the relative risk. Categorisation is as follows:

**Table 6.4: Risk Assessment Categories**

Risk Value	Risk Classification
> 12.00	Very high risk
10.00 to 11.99	High risk
8.00 to 9.99	Substantial risk
6.00 to 7.99	Possible risk
< 6.00	Low risk

After evaluating the potential significant pollution event scenario, a Risk Value of **(R) 5.7** is obtained indicating **Low Risk**.<sup>43</sup>

Given the nature of the ground conditions at the site and the design parameters, significant migration of pollutants from the production tower or storage silos is unlikely. Of greater potential concern would be emission of gas / odor / fugitive dust or spills at or near the site during the process, transfer or loading/unloading of product. However, such spills would, with regard to road haulage, be small, localised and containable. Containment of such spills would be more difficult and require detailed risk and contingency planning for the facilities in coordination with the local authorities and project proponent's relevant professional experts.

Good housekeeping and plant maintenance schedule will greatly reduce the risk of accidents, malfunction of machinery; and greatly enhance GMP (Good Manufacturing Practice) to produce safe, nourishing feed for the aquaculture sector in Myanmar.

#### **6.3.3 Potential hazards related to Aqua Feed Manufacturing Industries:**

Potential Food Safety hazard associated with Aqua Feed Production is a) chemical contamination, b) mycotoxins and c) microbiological contamination.

Grain or feedstuffs used in the manufacturing of aquafeeds which are mouldy, treated / dyed or otherwise discolored should not be used for any feed or food.

Mycotoxin found in mouldy feedstuffs may even at very low concentrations of a few parts per billion (ppb), have detrimental effects on farmed aquatic species.

#### **6.3.4 Potential defects:** decomposed feeds, and fungal spoilage.

Manufacturing quality control must insure that the feed produced will be consistently of a quality appropriate to the species fed. The process should include a comprehensive system of record-keeping to document that the appropriate standards of a formula are being met throughout the period of manufacture. Such records should be sufficient to make the product fully traceable.

#### **6.3.5 Technical guidance on Hazard Management of Aquafeed Production:**

- Dry fish feeds should be stored in cool and dry areas to prevent spoilage, mould growth and contamination. Moist feed should be properly refrigerated according to manufacturer instructions.
- Feed ingredients should not contain unsafe levels of pesticides, chemical contaminants, microbial toxins, or other adulterating substances.
- Industrially produced complete feeds and industrially produced feed ingredients should be properly labelled. Their composition must fit the declaration on the label and they should be hygienically acceptable.

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<sup>43</sup>Assumes the operations follow international HSE norms and excludes risk of natural disasters or extreme weather events

- Ingredients should meet acceptable, and if applicable, statutory standards for levels of pathogens, mycotoxins, herbicides, pesticides and other contaminants that may give rise to human health hazards.
- Only approved colors of the correct concentration should be included in the feed.<sup>44</sup>
- Moist feed or feed ingredients should be fresh and of adequate chemical and microbiological quality.
- Feed that is compounded industrially (or at the fish farm) should contain only such additives, growth promoting substances, fish flesh coloring agents; anti-oxidizing agents, caking agents or veterinary drugs that are permitted for fish by the official agency having jurisdiction.
- Products should be registered with the relevant national authority as appropriate.
- Storage and transportation conditions should conform to the specifications on the label.
- Veterinary drug and other chemical treatments should be administered in accordance with recommended practices and comply with national regulations.<sup>45</sup>

#### **6.4 Mitigation Measures: Draft Environmental Code of Practice in Aqua Feed Manufacturing<sup>46</sup>**

The objective of the code is to encourage adherence to Good Manufacturing Practice (GMP) during the procurement, handling, storage, processing and distribution of feed for food producing animals (including aquatic animals / organisms).

There are potential risks to human health associated with the contamination of feed with chemical or Biological agents. This code outlines the means by which these hazards can be controlled by adopting appropriate processing, handling and monitoring procedures.

##### **General management**

The ultimate responsibility for the production of safe and wholesome feed lies with the producer or manufacturer who should produce feeds with as low a level of hazard as possible and comply with any applicable statutory requirements.

The effective implementation of GMP protocols will ensure that:

**Buildings and equipment**, including processing machinery, will be constructed in a manner which permits ease of operation, maintenance and cleaning;

**Staff** will be adequately trained and that training is kept up to date;

**Records** will be maintained concerning source of ingredients, formulations including details and source of all additives, date of manufacture, processing conditions and any date of dispatch, details of any transport and destination;

**Water** used in feed manufacture is of potable quality;

<sup>44</sup> FAO/WHO, "Product Operations, Code of Practice for Fish and Fishery Products"

<sup>45</sup> CODE OF PRACTICE FOR FISH AND FISHERY PRODUCTS (CAC/RCP 52-2003)

<sup>46</sup> Draft Code of Practice for Good Animal Feeding, FAO, 1998

**Machinery** coming into contact with feed is dried following any wet cleaning process;

**Condensation** is minimized;

**Sewage, waste and rain water** is disposed of in a manner that ensures that equipment, ingredients and feed are not contaminated; and

**Feed processing plants, storage facilities and their immediate surroundings** are kept clean and free of pests.

**Raw materials of animal and plant origin:** Raw materials of animal and plant origin should be obtained from reputable sources, preferably with a supplier warranty. Monitoring of ingredients should include inspection and sampling of ingredients for contaminants using risk based protocols. Laboratory testing, where undertaken, should be by standard methods. Ingredients should meet acceptable, and if applicable, statutory standards for levels of pathogens, myco-toxins, herbicides, pesticides and other contaminants which may give rise to human health hazards.

In order to control the spread of specific pathogens it may be necessary to specify, for any given ingredient, the country and species of origin and any treatment process used prior to purchase. Care should be taken to preserve the identity of such material after procurement to facilitate any tracking that might be required.

**Minerals, supplements, veterinary drugs and other additives:** Minerals, supplements, veterinary drugs and other additives should be obtained from reputable manufacturers who guarantee the concentration and purity of ingredients and provide instructions for correct use.

**General management of feeds:** Feeds should be stored so as to prevent deterioration and contamination.

**Processed feeds** should be separated from unprocessed ingredients.

**Containers and equipment** used for transport, storage, conveying, handling and weighing should be kept clean.

**Equipment** should be flushed' with clean feed-material between batches of different formulations to control cross contamination.

**Pathogen control procedures**, such as pasteurization or the addition of an organic acid to inhibit mould growth, should be used where appropriate and results monitored.

Apart from feeds fed moist, such as silage and by-products of brewing, ingredients and feeds should be kept dry to limit fungal and bacterial growth. This may necessitate ventilation and temperature control.

**Waste and unsaleable material** should be isolated and identified, and only recovered as feed after freedom from hazardous contamination has been assured. Waste and unsaleable material containing hazardous levels of veterinary drugs, contaminants or any other hazards should be disposed of in an appropriate and, where applicable, statutory manner and not used as feed. If freedom from hazardous contaminants cannot be established, the material should be destroyed.

**Packaging materials** should be newly manufactured unless known to be free of hazards that might become feed-borne.

**Labels** should be consistent with any statutory requirements and should describe the feed and provide instructions for use.

**Feeds should be delivered and used** as soon as possible after manufacture.

**Personnel:** All plant personnel should be adequately trained and should work to GMP standards.

### **6.5 Plant Maintenance and Repair<sup>47</sup>**

The plant maintenance program is vital to consistent production of high quality feeds and no less important to cost control and assurance to the customer that their feed will arrive on time and to formula specification. Equipment breakdowns are bad enough as they impede aquaculture feed production, but at least as bad is machinery which is not working to design which may, through short weighing, or improper mixing, produce a defective feed. Such defective feed may, at the least, hurt the farmer's production and at worst create a serious crop failure. Also possible is a threat to human health.

Keeping motors, scales, pellet dies, conveyors and all other components of the mill in proper working order is as important as formulation or the quality of ingredients which go into the finished feed. Mechanical or electronic failures may occur from time to time in a complex system like a feed mill, but proper attention to preventive maintenance will minimize down time and the prospect of the customer receiving feed which is out of specification. A good preventive maintenance program should provide adequate maintenance at reasonable cost.

#### **6.5.1 Preventive Maintenance Objectives:**

- **Reduce major repairs** by correcting minor difficulties as soon as they are evident. This means listening to your operators who usually recognize before management that machinery is making a "funny noise" or other irregularity in performance of equipment. Do not punish employees who are trying to report a defect beyond their control;
- **Maintain equipment** in a more productive state. Keep it clean; repair or replace lost or worn parts immediately. Follow the machinery manual recommendations;
- **Improve scheduling of repairs.** Do not postpone needed repairs. Delaying repairs usually results in much more costly problems later on;

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<sup>47</sup> <https://www.fao.org>

- **Maintain safety.** Some parts as they become worn become dangerous, as in worn chain or belt drives. Staff are valuable and injuries are costly from the standpoint of lost time and training replacements, not to mention adverse impacts on employee morale;
- **Improved customer service.** A well-maintained mill looks good to the customer and helps assure the customer that the feed is made correctly the first time;
- **Reduce overall operating costs.** The miller of aquaculture feeds benefits from a well-maintained facility through reduced costs of operation and customer satisfaction;
- **Provide trained maintenance personnel.** Training of maintenance staff should be a high priority with high-level management oversight. Too often maintenance is seen as the bottom of the ladder, when in reality the quality and training of staff for this important responsibility should be paramount.

#### 6.5.2 Building and Grounds Maintenance:

- The building grounds shall be adequately drained and maintained to be reasonably free from litter, waste, refuse, uncut weeds or grass, standing water and improperly stored equipment.
- The buildings shall be maintained in a reasonably clean and orderly manner.
- Adequate space, ventilation and lighting shall be maintained for the proper performance of all manufacturing, storing, labelling, quality assurance and maintenance aspects of aquaculture feed manufacturing.

**Table 6.5: Preventive Maintenance Checklist in the Feed Mill**

<b>Preventive Maintenance in the Aqua Feed Mill</b>		
<b>Item</b>	<b>Equipment</b>	<b>Maintenance Functions to be checked</b>
1	Bucket Elevator	cups, belt, splice drive, gear box, grease bearings, tension and alignment
2	Feed Mixer	gear box, gates and oiler, grease bearings, check drive, ribbons / paddles, air sweep, traps.
3	Chain Drag Conveyors	paddles, chain condition and sprockets, gear box, drive grease bearing, vari-speed unit (bearing, belt) trough.
4	Screw Conveyors	flighting, gear box, drive, grease bearings, vari-speed unit (bearing, belt).
5	Pellet Mill	oil, change oil and filter, vari-speed unit, grease rolls, grease bearing, main bearings and drive, grease motor bearings, check rolls and die condition.
6	Coolers	chain, vari-speed unit, mesh, grease bearing, gear box,
7	Crumbler	belts and drive, grease bearing.
8	Shaker and Scalpers	screws, gear box, grease pads, grease bearing.
9	Grain Dryer	chains, drags, elevators bearings.
10	Dusting Reel	drive and bearings
11	Blender	Vari-speed unit, grease bearings, drive and belts.
12	Hammer Mill	screens and hammers, clean magnet, grease bearing, drive and gear box, clutch, housing.
13	Roller Mill	magnets, belts, rollers, bearings and locks, tighteners.
14	Bagger	gear box, gear bearings, air oiler, gates and air cylinder.
15	Sewing Machine	oil and clean
16	Bag Conveyors	drive and belt, grease bearing.
17	Air Compressors	check oil, drain water, belts, filter, change oil.



19	Boiler	pressure safety valves, low water cut-off, international inspection, burner function, pump lubrication, water softener.
20	Liquid Pumps	drive, packing and lubrication.
21	Man Lift	lubrication, adjustment, control function.
22	Distributors	cleanliness, adjustment, wear and lubrication (turnheads, verti-flo and swing-flo).
23	Small Scale	test weigh, cleaning, lubrication and test weight by qualified scale repairman (recommend maintenance agreement).
24	Motor Truck Scale	printer accuracy (relative needle reading). weight accuracy (relative other scales), free movement, deck and pit cleanliness, cleaning, lubrication and test weight by qualified scale repairman (recommend maintenance agreement).
25	Bob Cat & Fork Lift	operators and maintenance, personal review, operating manual and perform required service.
26	Tools and Equipment	condition and proper tools for jobs being performed.
27	Repair Parts Inventory	Type and number of replacement parts, adequate to support an effective preventive maintenance program.
28	Plant Equipment	Plan equipment modification, replacement or addition which will reduce maintenance and operating cost.
29	Building	paint, concrete work, doors, roofs, adequate lighting, general appearance. (plan improvements)
30	Bag House / Filter collector	differential pressure, socks, cages, spouting, air locks and couplings.

## 6.6 Proposed Mitigation Measures

Further to the above mentioned tools for hazard preventive practices, environmental code in occupational health / safety, and plant preventative maintenance plans, priority measures that may be necessary in addition or as a focus of the EMP are listed below.

### 6.6.1 Construction Phase Mitigation

#### Bio-Physical, Chemical

Construction Phase Mitigation Measures				
Bio Physical Chemical				
Ref:	Impact Issue	Impact Significance	Mitigation Measures	Residual Impact
BPC/1	Changes in surface water quality	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Minimize runoff by minimizing vegetation clearing activities.</li> <li>- Put in place a set of procedures for the stockpiling and removal of waste materials (particularly liquid, hydrocarbon and human waste.</li> <li>- Mobile equipment should be serviced off site.</li> <li>- Sub-contractor should be penalized for</li> </ul>	Low

			<p>incorrect disposal of waste.</p> <ul style="list-style-type: none"> <li>- Establish sewerage facilities on site with sealed conservancy tanks or ensure that septic tank soak are always located in the moderate vulnerability areas. If used, conservancy tanks are to be emptied into the local sewerage works. Formal arrangements for tanker services to be established with private sector or operations to ensure regular conservancy tank maintenance and removal of tanks at the end of construction.</li> <li>- Prevent contaminated storm water running off the site.</li> </ul>	
BPC/2	Changes in groundwater quality	Low	<p><b>EMP and focus on:</b></p> <ul style="list-style-type: none"> <li>- Ensure toxic compounds are not located at water accumulation points.</li> <li>- Chemically contaminated run-off should be intercepted and discharged where it will not leak to and contaminate groundwater.</li> </ul>	Low
BPC/3	Changes to drainage patterns	Low	<ul style="list-style-type: none"> <li>- Ensuring alteration of drainage pattern does not increase the risk of localized flooding.</li> </ul>	Low
BPC/4	Changes in rates of erosion and siltation	Low	<p><b>EMP and focus on:</b></p> <ul style="list-style-type: none"> <li>- Fencing of the site prior to clearing operations.</li> <li>- Minimum clearing of vegetation in low fire risk areas.</li> <li>- Dispose of any spoil material away from water courses and stabilize appropriately.</li> </ul>	Low
BPC/5	Changes to air quality	Medium	<p><b>EMP and focus on:</b></p> <ul style="list-style-type: none"> <li>- Ensure vehicle exhausts fully operational.</li> <li>- Water the construction roads to prevent excess dust.</li> <li>- Avoid burning vegetation or waste.</li> </ul>	Low
BPC/6	Changes to ambient noise levels	Medium	<ul style="list-style-type: none"> <li>- Ensure vehicle exhausts fully operational.</li> <li>- Ensure material delivery between 7 am to 7 pm.</li> <li>- Route construction traffic away from</li> </ul>	Low

			residential areas.  - Avoid operation heavy machinery from 7pm to 7am.	
BPC/7	Changes to aquatic biota (if any)	Low	<b>EMP and focus on:</b>  - No discharge of oil or chemicals in to surface water.  - No discharge of solid or domestic wastes from construction site to nearby water resources.	Low
BPC/8	Changes to terrestrial biota	Low	<b>EMP and focus on:</b>  - No issues related with terrestrial biota	Low
BPC/9	Changes to disease vector populations	Low	<b>EMP and focus on:</b>  - Minimize vegetation clearance in areas not designated for operational use.	Low
BPC/10	Changes in Land Cover	Medium	<b>EMP and focus on:</b>  - Landscaping plan for greenery area at project site.	Low
BPC/11	Changes in Natural Heritage Site	Low	<b>EMP and focus on:</b>  - Avoid Natural heritage site (if any)	Low
BPC/12	Changes to areas of natural habitat	Low	<b>EMP and focus on:</b>  - Preserve existing mangrove stands as far as possible without compromising construction or operational site safety.	Low

No use this data

### ***Socio Economic, Cultural***

<b><i>Construction Phase Mitigation Measures for Socio Economic Impacts</i></b>				
Ref:	Impact Issue	Impact Significance	Mitigation Measures	Residual Impact
SEC/1	Changes involving loss of private assets.	Low	<b>EMP and focus on:</b>  - Ensure compensation at market rates. (if any)	Low
SEC/2	Changes involving loss of cultural heritage	Low	<b>EMP and focus on:</b>  - Consult with local communities prior to construction and negotiate relocation of any significant items of cultural heritage. (if any).  - Avoid siting infrastructure in areas of known importance. (if any)	Low
SEC/3	Changes involving displacement of people (if any)	Low	<b>EMP and focus on:</b>  - No issue of displacement	Low

SEC/4	Changes to local traffic patterns	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Adherence to all speed limits for construction traffic.</li> <li>- Avoid road use at night and at peak times if possible.</li> <li>- Route construction traffic away from residential areas if possible.</li> </ul>	Low
SEC/5	Changes to fisheries (if any)	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Minimizing siltation in water courses and rivers</li> <li>- Controlling polluted discharges to surface water.</li> </ul>	Low
SEC/6	Changes in local wage labor incomes/ livelihood opportunities	Medium	<b>Benefit enhancement:</b> <ul style="list-style-type: none"> <li>- Consider local youths' livelihood enhancement measures as part of the CSR program.</li> <li>- Consider priority hiring of local labor.</li> </ul>	Low
SEC/ 7	Changes in local trade/ commercial incomes/ opportunities.	Low	<b>Benefit enhancement:</b> <ul style="list-style-type: none"> <li>- Consider priority sourcing of good and services from local suppliers.</li> </ul>	Low
SEC/8	Changes in visual amenity	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Effective waste management plan</li> <li>- Rehabilitation of disturbed areas.</li> <li>- Suitable site fencing.</li> </ul>	Low
SEC/9	Changes to public infrastructure/ community resources	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Consider allowing community connections to utilities extended towards the project site.</li> </ul>	Low

#### **6.6.2 Operational Phase Mitigation**

##### **Bio-Physical, Chemical**

Ref:	Impact Issue	Impact Significance	Mitigation Measures	Residual Impact
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BPC/1	Changes in surface water quality	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Prevent contaminated storm water running off the site.</li> <li>- No soiled materials, solid wastes, toxic or hazardous materials should be poured or thrown into water bodies for dilution or disposal</li> <li>- Collect and properly dispose of small maintenance materials such as oily rags, oil filters, used oil, etc.</li> <li>- Mobile equipment should be serviced off site.</li> <li>- Establish sewerage facilities on site.</li> </ul>	Low
BPC/2	Changes in groundwater quality	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Ensure toxic compounds are not located at water accumulation points.</li> <li>- Chemically contaminated run-off should be intercepted and discharged where it will not leak to and contaminate groundwater.</li> </ul>	Low
BPC/3	Changes to drainage patterns	Low	- No mitigation require beyond adherence to the EMP.	Low
BPC/4	Changes in rates of erosion and siltation	Low	- No mitigation require beyond adherence to the EMP.	Low
BPC/5	Changes to air quality	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Ensure vehicle exhausts fully operational;</li> <li>- Utilize relevant pollution control machinery to capture any emitted fugitive dust, particulate matter, odor, gas or vapor from production process;</li> <li>- Avoid burning debris, vegetation or waste;</li> <li>- Avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals;</li> <li>- Minimize dust from exposed work sites / dirt roads by applying water on the ground regularly.</li> </ul>	Low

BPC/6	Changes to ambient noise levels	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Ensure vehicle exhausts fully operational.</li> <li>- Possible use of well-maintained machines and vehicles during night shift to prevent from noise impact upon the environment.</li> <li>- Minimize project transportation through community areas</li> <li>- Possible use of silencers in production machinery; and noise insulators during material delivery, generator or boiler functioning; ensuring noise level within the acceptable limit.</li> <li>- Use noise-control methods such as fences, barriers or deflectors (such as muffling devices for combustion engines or planting of fast-growing trees)</li> <li>- Maintain a buffer zone (such as open spaces, row of trees or vegetated areas) between the project site and residential areas to lessen the impact of noise to the living quarters.</li> </ul>	Low
BPC/7	Changes to aquatic biota (if any)	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- No discharge of oil or chemicals in to surface water.</li> </ul>	Low
BPC/8	Changes to terrestrial biota	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- No issues related with terrestrial biota.</li> </ul>	Low



BPC/9	Changes to disease vector populations	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Store all food and organic waste in sealed containers.</li> <li>- Ensure regular refuse collection and disposal.</li> <li>- Keep worksite clean and free of debris on daily basis</li> <li>- Avoid creating areas of standing water to discourage mosquito breeding.</li> <li>- Educate workforce on personal hygiene, occupational health and safety.</li> <li>- Provide personal protective gear for workers as necessary (safety gloves, dust masks, hard hats, boots, goggles, etc.)</li> <li>- Keep corrosive fluids and other toxic materials in properly sealed containers for collection and disposal in properly secured areas</li> <li>- Provide adequate sanitation facilities for workers on site.</li> </ul>	Low
BPC/10	Changes to land cover	Low	- No mitigation required beyond adherence to the EMP.	Low
BPC/11	Changes to Natural Heritage Site	Low	- No mitigation required beyond adherence to the EMP	Low
BPC/ 12	Changes to areas of natural habitat	Low	- No mitigation required beyond adherence to the EMP.	

### ***Socio Economic, Cultural***

<b><i>Operational Phase Mitigation Measures for Socio Economic Impacts</i></b>				
Ref:	Impact Issue	Impact Significance	Mitigation Measures	Residual Impact
SEC/1	Changes involving loss of private assets.	Low	- No mitigation required	Low
SEC/2	Changes involving loss of cultural heritage	Low	- No mitigation required	Low
SEC/3	Changes involving displacement of	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- No issue of displacement</li> </ul>	Low

	people (if any)			
SEC/4	Changes to local traffic patterns	Medium	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Adherence to all speed limits for factory traffic.</li> <li>- Avoid road use at night and at peak times if possible.</li> <li>- Route conveyor traffic away from residential areas if possible.</li> </ul>	Low
SEC/5	Changes to fisheries (if any)	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Controlling polluted discharges to surface water</li> </ul>	Low
SEC/6	Changes in local wage labor incomes/ livelihood opportunities	Medium	<b>Benefit enhancement:</b> <ul style="list-style-type: none"> <li>- Consider priority hiring of local labor.</li> </ul>	
SEC/ 7	Changes in local trade/ commercial incomes/ opportunities.	Medium	<b>Benefit enhancement:</b> <ul style="list-style-type: none"> <li>- Consider priority sourcing of good and services from local suppliers</li> </ul>	
SEC/8	Changes in visual amenity	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Effective waste management plan</li> <li>- Suitable site fencing.</li> </ul>	Low
SEC/9	Changes to public infrastructure/ community resources	Low	<b>EMP and focus on:</b> <ul style="list-style-type: none"> <li>- Consider allowing community connections to utilities extended towards the project site.</li> </ul>	Low

## 7. Cumulative Impacts Assessment

## **7.1 Methodology and Approach**

When assessing the impacts of the Project, it is necessary to consider the cumulative impacts that might occur from the combined effect over a given resource of several projects that would be operated physically close to the Proposed Project. Therefore the surrounding projects should be considered for their potential impacts for assessing cumulative impacts. Cumulative impacts encompasses impacts that result from the incremental impact, on areas or resources used or directly impacted by the Project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted. The IFC (2012) defines cumulative impacts as those generally recognized as important on the basis of scientific concerns and or concerns from affected communities

## **7.2 Potential Cumulative Impact Assessment**

Cumulative impacts in this Section refer to the additional impacts that may be generated by other developments or activities in the vicinity of the Project Site, that when added to the impacts of the construction and operation of the proposed Project combine to cause a greater impact. Such impacts may arise due to spatial overlap (e.g. overlap in spatial extent of air quality changes) or temporal overlap (e.g. noise impacts caused by construction activities at the same time from different sources).

Operation of the existing projects in and around the site will be concurrent and in close vicinity. Given that the traffic to and from the all project sites, cumulative impacts will likely occur.

The key potential cumulative impacts assessed are:

- Impacts to water quality due to land-based runoff and water-based works during construction and operation of other Projects in the environs;
- Impacts from waste generation and disposal through the construction and operation of the Projects;
- Impact from vehicular, generator and boiler operation of the Project itself and other neighboring projects in the vicinity;
- Socio-economic impacts to possible displaced people who depend on the Project Sites for livelihood activities; and
- Impacts to air quality and public health from accidental spills and leaks, fugitive dust and particulate matter emitted from the project itself and / or other nearby projects.

Figure 23 below shows surrounding projects surrounding the De Heus Aqua Feed Mill Compound: 1) The De Heus Animal (livestock) Feed Mill and 2) the Textile Factory and 3) some undeveloped and unused land nearby, all of which the key potential cumulative adverse impacts mentioned above are being assessed as of **Low significance**, although oftentime, the noise and air quality levels, may exceed the permissible allowable limit for a short period of time. However, all these can be mitigated by adhering to good manufacturing practices and plant maintenance plans for the project itself and also appropriate coordination from the other neighboring factories for the overall conservation of the environment.



**Figure 23: Neighboring Factories around Aqua Feed Mill Factory Project Area**

## 8. Environmental Management, Monitoring and Budget Allocation

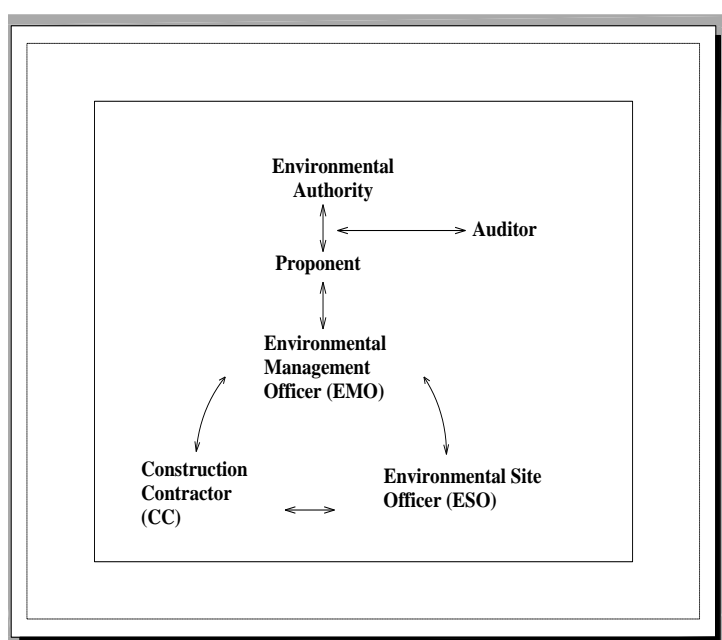
EMPs outline the mitigations, monitoring, and institutional measures to be taken during Project implementation and operation to avoid or control adverse environmental and social impacts and the actions needed to implement these measures.

### 8.1 EMP Organization

This section defines the organization set up by the EMP if necessary and as required, for the proponent and the Construction Contractors for the implementation of the EMP and the roles and responsibilities devoted to each position involved in the process. Three levels of organization, fully complementary, are set-up by the EMP.

- The Environmental Auditor (may be internal or independent external)
- The Environmental Management Officer (EMO),
- The Environmental Site Officer (ESO)

General organization is presented in the following figure:



**Figure 24: EMP Organization**

The Environmental Management organization described above includes an Environmental Management Officer (EMO) and an Environmental Site Officer (ESO). The EMO function is for the duration of the construction period plus post-construction audit and operational period.

The EMO role is executed by:

- An environmental management officer attached to the Project who may be an external specialist or a suitably qualified or oriented staff member from the Proponent's organization;
- Support from the site construction supervision staff.

The EMO coordinates (directly or through the site construction supervision staff) with the various CCs and with the ESO(S) appointed by the Construction Contractors. The overall role of the EMO is to oversee and monitor adherence to, and implementation of, the EMP by the CCs (which includes compliance with the relevant obligations contained in the EMP).

The EMO is assisted by the site supervision staff and the ESO on the CC's side, responsible for monitoring construction-related activities and implementing environmental measures on site as part of the EMP conditions.

The ESO is the CC's focal point for all environmental matters, and coordinates directly with the EMO and CE. The ESO is routinely on-site for the duration of the construction works.

ESOs are appropriated technical officers (often the CC site engineer), who has the knowledge of environment issues on the project site. The ESO carries out regular inspections of the CC activities in relation to environmental issues, and provides day-to-day advice to Contractor personnel about environmental issues. Verification is provided by the EMO.

#### **8.1.1. EMO Roles & Responsibilities**

The EMO should be responsible for monitoring, reviewing and verifying compliance with the EMP by the Construction Contractor. The ESO should also ensure compliance (as per the construction contractor). The EMO's duties in this regard, and working with the CE, who will have day-to-day interaction through supervisory staff, should include the following:

- Ordering the removal of person(s) and / or equipment not complying with the specifications;
- Verifying Environmental Compliance
- The issuing of penalties for contraventions of the EMP;
- Taking decisions in case of severe non-compliances to the EMP are detected;
- Providing input for on-going internal review of the EMP
- Stopping works in case of emergency or if significant environment impacts are apparent or imminent.

The EMO ensures the CC has all plans, procedures, approvals, and documentation in place to ensure EMP compliance prior to commencement of any work. The EMO's duties here include the following:

- Supervising updating and maintenance of the EMP;
- Monitoring and verifying that the EMP is adhered to at all times and taking action if the specifications are not followed;
- Monitoring and verifying that environmental impacts are kept to a minimum
- Sampling sites and surrounding areas regularly with regard to compliance with the EMP;
- Recommending to stop work in emergencies or if significant environmental impacts are apparent or imminent;
- Preparing the background information for the Reports
- Participating, upon request in meetings with the environmental authorities as requested.

#### **8.1.2 ESO Roles & Responsibilities**

The ESO(s) has the principal responsibility for observing construction activities and ensuring that those activities are in compliance with the EMP requirements. To accomplish this, each ESO should be familiar with the EMP and contract specifications.

The specific responsibilities of the ESO are to:

1. Monitor implementation of environmental measures by CC construction staff against



contractual obligations by:

2. Performing regular monitoring activities;
3. Detecting non-conformance and approving corrective action (with advice from EMO if necessary)
4. Evaluating CC environmental efforts and effectiveness; and
5. Identifying circumstance requiring management decisions to evaluate variance or compliance issues.
6. Compile documentation of monitoring observations by:

Collecting any specific data that the ESO is assigned to monitor;

- Interface with EO to assist in field interpretation of environmental requirements, provide advice regarding corrective actions and resolving non-compliance situations, and issue specific formal instructions to the CC workforce;
- Interface with CC manager to help communicate requirements, obtain a hands-on view of special problems so that implementation difficulties can be communicated to the EMO to aid in problem resolution especially in situations where adjustment of compliance requirements may be necessary;
- Communicate to EMO by:  
Interaction with EMO as needed to define corrective action recommendation for any identified non-compliance situation.
- Implementation for environmental controls and measures specified in the EMP, Sub-Plans.
- Ensuring measures to protect project staff health are implemented.

## **8.2 Water Quality Management Plan**

*Surface Water Quality Management, Ground Water Protection Plan and Ensure safe drinking water*

Objective	To reduce discharge of wastes that impact water quality and to determine if additional implementation of management practices are necessary to improve and/or protect water quality. Ensure safe drinking water, which is essential for good health.
Legal Requirements	National Environmental Quality (Emission) Guidelines, 2015
Implementation Schedule	During Construction, Operation and Decommissioning Phases

Management Action	<ul style="list-style-type: none"> <li>Put a set of procedure for the stockpiling and removal of waste material (particularly liquid, solid and human waste) from project site; and establishing sewerage facilities on site;</li> <li>Regularly inspect the accumulated solid waste for periodic removal from site for proper waste treatment or disposal for recycling;</li> <li>Installation of proper waste water drainage outside work premises.</li> <li>Provide a rain water drainage system. Keep the drainage clean and clear on a regular basis;</li> <li>Chemically contaminated run-off should be intercepted and discharged where it will not leak to contaminate ground water.</li> <li>Provide proper facilities for drinking water near the work area;</li> <li>Ensure that there is always safe drinking water available and that the water cannot be contaminated by dust, chemicals, or dirt for example spread by insects.</li> </ul>
Monitoring Plan	<p>Monitor the waste water from the project area before discharging into the nearby water body. Monitor the solid waste from the production process and ensure that they are systematically disposed for recycling and environmental protection measures.</p> <p>Ensure safe drinking water adhering to National Environmental Quality Guidelines, 2015 for safe drinking water and waste water effluent.</p>
Parameters for waste water and drinking water	<ul style="list-style-type: none"> <li>Turbidity, EC, Total hardness, Total dissolved Solids, Chloride, Sulfate, Calcium, Magnesium, BOD, COD, pH, Temperature, Ammonia for waste water;</li> <li>Physico-Chemical parameters (e.g. Turbidity, EC, Total hardness, Total dissolved Solids, pH, Temperature, Iron (as Fe), SO<sub>4</sub>, Nitrates (as NO<sub>3</sub>), Fluoride (F), etc. and Microbiological parameters (E-coli and total coliforms) for drinking water.</li> </ul>
Location	One sample at outlet of Project Area (surface water), and one sample for drinking water
Frequency	Twice per year
Budget Allocation	100,000 Kyats / test (100,000 x 2 x 2 Kyats per Year) = 400,000 Ks
Responsibilities	Monitoring by EMP Organization or Third Party

### **8.3 Drainage Management Plan**

Objective	To flow clean water outside the project area
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Legal Requirements	National Environmental Quality (Emission) Guidelines, 2015
Implementation Schedule	During Construction and Operation Period
Management Action	Avoid removing and altering the natural features of the land as much as possible; Provide proper waste drainage outside work premises, provide a rain water drainage system, keep the drainage clean and clear on a regular basis; Periodically clear drainage, maintain channels to prevent seepage and reduce inefficiencies resulting from siltation and weeds, all access to channels for maintenance in design, application of effective litter prevention and control, implementation of secondary containment procedure that avoid accidental or intentional releases of contaminated containment fluids.
Monitoring Plan	Site supervision during operational period; once a week
Parameters	Good housekeeping and professional landscape and drainage design
Location	Site Project Area
Frequency	Weekly
Budget Allocation	500,000 Kyats/ year
Responsibilities	Monitoring by EMP Organization or Third Party

#### **8.4 Air Quality Management Plan**

Objective	To reduce the potential impacts of noise and dust; to reduce exposure to fine dust; to ensure clean physical environment; To monitor emissions from Project activities and establish measures to mitigate emissions from Project activities to meet air quality legislative requirements and to reduce the Project effects to reasonable levels.
Legal Requirements	National Environmental Quality (Emission) Guidelines, 2015
Implementation Schedule	During Construction, Operation and Decommissioning Phases
Management Action	The following are some mitigation measures : <ul style="list-style-type: none"> <li>Implement rigorous daily housekeeping practice. Use water when cleaning. Take care not to spread dust;</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Clean properly at each workplace; avoid spreading of dust, especially from pre-mixing, grinding machines and inspect any control point that is emitting odor, gas or vapor;</li> <li>▪ Improve local exhaust ventilation at dust generating work station, in particular the feed grinding work; Enclose or isolate feed grinding or any other dust generating tasks;</li> <li>▪ Reduce noise at the source by using properly designed, maintained, and adjusted tools or machines;</li> <li>▪ Screen or isolate the noise source as much as possible; reduce noise reflection by raising the ceiling or using sound-absorbing materials, use relevant PPE (ear muffs / ear plugs) when necessary;</li> <li>▪ Avoid burning of materials, vegetation or waste on site</li> </ul> <p>Odor management:</p> <ul style="list-style-type: none"> <li>▪ Operators to use relevant PPE (Personal protective equipment) during operation and decommissioning phases;</li> <li>▪ Keep additives / chemical containers covered. Avoid letting hazardous vapors escape around the workshop.</li> </ul> <p>Aqia Feed Chemical management:</p> <ul style="list-style-type: none"> <li>▪ Check all chemical containers are properly labelled and material safety data sheets are provided for all chemical products;</li> <li>▪ Seek to use water-based chemicals instead of solvent-based ones. Introduce local exhaust ventilation. Keep containers covered;</li> <li>▪ Change the work method in order to reduce direct handling of hazardous materials. Rotate work tasks;</li> <li>▪ Provide workers with and use suitable protective clothing and gloves to avoid direct contact with hazardous materials.</li> </ul> <p>Dust Management</p> <p>Material handling has to be limited to as little as possible to prevent the generation of dust. Avoid spreading of dust.</p>
Monitoring Plan	<p>Monitoring of air quality at project site, and in general ventilation air,</p> <p>Air quality monitoring, including the occurrence of dust and possible air pollutants, will be carried out to establish the emissions associated with the site activities during Operation.</p> <p>Monitoring will occur on a yearly basis and results of the monitoring program will be</p>

	recorded and reported annually. If adverse conditions are found in a particular area or process, adaptive management policies will be implemented.		
Parameters	Nitrogen dioxide (NO <sub>2</sub> ), Ozone (O <sub>3</sub> ), Particulate Matter (PM <sub>10</sub> ), Particulate Matter (PM <sub>2.5</sub> ), Sulfur dioxide (SO <sub>2</sub> ), Total Suspended Particulate (TSP), CO, Temp, Relative Humidity.		
	NEQEG Noise Level Parameters		
	Receptor	One hour LAeq (dBA) <sup>a</sup>	
		Daytime 07:00 – 22:00 (10:00 - 22:00 for Public holidays)	Night Time 22:00 – 07:00 (22:00 - 10:00 for Public holidays)
	Residential, institutional, educational	55	45
	Industrial, commercial	70	70
	<sup>a</sup> Equivalent continuous sound level in decibels		
Location	One sample is measured to cover the whole Project Area		
Frequency	Once per year		
Budget Allocation	1,500,000 Kyats x 1 / year = 1,500,000 Kyats / year		
Responsibilities	Monitoring by EMP Organization or Third Party		

### 8.5 Waste Management

Objective	Avoid exposure of waste to natural resources such as soil, air and water; due to waste produced from project site. Ensure proper waste management practices to enhance community well-being.
Legal Requirements	National Environmental Quality (Emission) Guidelines, 2015
Implementation Schedule	During Construction, Operation and Decommissioning Phases
Management Action	<ul style="list-style-type: none"> <li>Provide sufficient waste containers of adequate size. Establish a regular system for removing waste from the workplace;</li> <li>Specify clear responsibilities for waste disposal. The disposal of waste, dumping for solid waste produced from production process should be disposed</li> </ul>

	<p>periodically for recycling or municipal waste treatment plant and avoid waste-mountain outside the production tower.</p> <ul style="list-style-type: none"> <li>▪ Diversion and management of surface and waste water to minimize water pollution problems. Simple treatment to reduce the dis-charge of suspended solids may also be necessary.</li> </ul>
Monitoring Plan	<p>Collected and provided to a waste recycling facility when there is a sufficient quantity to warrant collection.</p> <p>Inspect solid and liquid waste disposal system on site (ensure segregation of waste: bins and waste separation, sewerage facilities functional) for safe environment.</p>
Parameter	Waste generated at the Project is monitored on a weekly basis through waste disposal receipts.
Location	the whole Project Area
Frequency	Weekly
Budget Allocation	300,000 Kyats/ month {(3,600,000) Kyats/ Year}
Responsibilities	Monitoring by EMP Organization or Third Party

### **8.6 Traffic Management Plan**

Objective	<p>To ensure the safety of the traffic</p> <p>To prevent air pollution on transportation routes</p> <p>To have better services of traffic</p> <p>To Reduce disturbance and mortality related to roads and traffic</p>
Legal Requirements	Social Security Law (2012)
Implementation Schedule	During Construction and Operation Phases
Management Action	To avoid traffic congestion in the project area, the speed of vehicles and the volume of loads will be limited by regulation. And regular checking on the capacity of trucks and drivers whether they will follow the rules and regulations or not. In addition, puddles and pits are frequently reclaimed and expand the truck routes.
Monitoring Plan	<p>Designate specific roadways or provide alternate routes for light duty vehicles in high activity or congested areas.</p> <p>Adhere to all traffic rules, signals, speed limits and warnings.</p> <p>Design traffic patterns to reduce exposure to blindside hazards.</p> <p>Always ensure equipment is stopped in a safe area</p> <p>Always make eye contact or use hand signals before boarding equipment and again, wait</p>



	for positive response.
Location	the whole Project Area
Frequency	Daily
Budget Allocation	500,000 Kyats (Lump sum per year)
Responsibilities	Monitoring by EMP Organization or Third Party

### **8.7 Community Engagement and Development Plan**

<b>Objective</b>	<p>To inform communities about Aqua Feed production activities, work schedules, potential health and safety issues and how to engage with the project for any grievances</p> <p>Community engagement plan, the following information will be conducted such as raising awareness campaign to local community to understand how they will get benefits developing the project in this areas and the best way to cooperate projects activities</p>
<b>Legal Requirements</b>	Social Security Law (2012)
<b>Implementation Schedule</b>	During Construction and Operation Phases
<b>Management Action</b>	<p>Community Engagement</p> <p>Community engagement can foster an open and meaningful dialogue that can not only help to build trust, respect and legitimacy for project operation, but also support effective decision making. This is because engagement can address community concerns, manage expectations, tap local knowledge and help negotiate a mutually beneficial future. In addition, show that where conflicts exist between the company and the local community, delays are common and there are often striking differences in perceptions between the company representatives and communities. Breakdowns in perception, communication and understanding are common.</p> <p>Community Development</p> <p>Employment:</p> <p>Communicate available opportunities at the Project in advance, so as to manage employment expectations;</p> <p>Employment of locals and an increase in salary earners;</p> <p>Maximize &amp; monitor local recruitment</p> <p>Prevent nepotism/ corruption in local recruitment structures</p> <p>Promote the employment of women and youth</p> <p>The Company provided they meet the education and skills/experience criteria. The company will implement a multi-skill and entrepreneurship training program to all</p>

	<p>employees during working life to prepare them for work outside.</p> <p>Education:</p> <p>The company will seek to support schools in the neighborhood by addressing needy areas such as infrastructure development, offering a limited number of scholarships for exceptionally performing students/pupils as an incentive for hard work, sponsoring orphans and pupils from vulnerable families etc.</p> <p>Economic Development:</p> <p>Determine party responsible for relocation. For non-vulnerable households and individuals, negotiate a favorable outcome on a case-by- case basis.</p> <p><b>Health and Welfare</b></p> <p>Extensive HIV/ AIDS and other current health awareness campaign</p> <p>Cease construction activities before nightfall</p> <p>Clear identification of workers; prevention of loitering - Liaison with police</p> <p>Do not recruit laborers on-site.</p>
<b>Monitoring Plan</b>	<p>One of the most important aspects of stakeholder engagement is reporting and monitoring to measure progress and allow follow up. This can be done using meeting logs to report on formal meetings, informal meetings, telephone calls, visits of community members to the site or information office, emails or any other form of contact with the community. The meeting logs should also record the type of meeting, attendees/participants, date, issues and be supplemented by a commitment register, a meeting attendance register and an activity register, that lists the action points agreed to.</p>
<b>Location</b>	Nearby Village or local community
<b>Frequency</b>	Regularly Monitoring and Annual Reporting
<b>Budget Allocation</b>	700,000 Kyats (Lump sum/year)
<b>Responsibilities</b>	Monitoring by EMP Organization or Third Party

### **8.7 Occupational Health and Safety**

Objective	To reduce operation work-related deaths, injuries, and ill health
Legal Requirements	<p>Social Security Law (2012)</p> <p>Employment and Skills Development Law (2013)</p> <p>The Occupational Explosive Material Law (June 2018)</p>
Implementation Schedule	During Construction, Operation and Decommissioning Phases

<p>Management Action</p>	<p>Health and Safety of Population</p> <p>Lack of care or lack of information can cause accidents (e.g. traffic incidences, electrocution where they may suffer injury, and risk of fire hazard). Thus, people or workers under direct influence of project should be informed by project proponent or their appointed representative regarding appropriate security precautions for example: Using appropriate PPE (Personal Protective Equipment) during operation; Participation of training programs regarding adhering to emergency response procedures and activities; Abiding to good and standard practice and procedures for relevant machineries and equipment; and Monitoring of alarm system for emergency conditions.</p> <p>Occupational Health</p> <p>The manager must take effective steps to ensure the safety and health of the workplace. Workers should first be given training prior to the use of machinery / equipment for safety reasons and should report to relevant departments for accidental cases.</p> <p>Pre-employment and regular medical examinations shall be carried out on all plant employees. The Company will provide well-equipped sanitary facilities for its employees.</p> <p>Occupational Safety</p> <p>Minimum age of employment is 18 year of age (Children should not be working with hazardous chemicals);</p> <ul style="list-style-type: none"> <li>- One day of rest per week</li> <li>- Limited working hours</li> <li>- Provision of clean water and medical facilities</li> <li>- Right of inspectors to survey safety and health</li> </ul> <p>Occupational Health and Safety Training</p> <p>The level of training that site personnel receive in emergency preparedness needs to be significantly increased. In particular emphasis should be placed on testing the whole emergency response system, especially under worst case scenarios such as night or weekend. Training shall consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site specific hazard or color coding in use shall be thoroughly reviewed as part of orientation training.</p> <p>Occupational Safety Wear</p>
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	<div> </div> <p>Area Signage</p> <p>Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors and the general public as appropriate.</p>
Monitoring Plan	<ul style="list-style-type: none"> <li>- Define the scope of the Management Plan including roles, responsibilities and time frame;</li> <li>- Prepare a list of potential community health, safety and security risks associated with the proposed Project</li> <li>- Discuss Project commitments, programs, operational procedures and guidance that respond to and mitigate the identified risks</li> <li>- Suggest monitoring and reporting procedures and identify Key Performance Indicators to measure the achievements of the proposed Project Commitments and Programs</li> <li>- Anticipate training requirements</li> </ul>
Location	Direct Affected Area
Frequency	Regularly Monitoring and Quarterly Reporting
Budget Allocation	2,400,000 Kyats (Lump sum/year)
Responsibilities	Monitoring by EMP Organization or Third Party

### 8.8 Emergency and Rescue Plan

Objective	Ensure processes for requesting outside emergency support, notification of officials and incident documentation is clearly defined, communication tools are understood and the appropriate action is taken.  Ensure training is thorough and often with written instructions available in all areas to support immediate and effective response.									
Legal Requirements	Natural Disaster Management Law (2013), National Fire Protection Agency (NFPA 58) standard									
Implementation Schedule	During Construction and Operation Phase									
Management Action	Emergency Contacts									
	EMO	Head								
	External Emergency Response Team (EERT)	Member								
	ESO (1 No.)	Member								
	<table><thead><tr><th>Entity</th><th>Responsibilities</th></tr></thead><tbody><tr><td>EMP Team (ERT)</td><td>Communicates / alerts the EERT.  Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site.  When necessary &amp; requested by the EERT, lends support / provides assistance during EERT's response operations</td></tr><tr><td>External Emergency Response Team (EERT)</td><td>Solves the emergency / incident</td></tr><tr><td>Resources</td><td>Provide and sustain the people, equipment, tools &amp; funds necessary to ensure Project's quick response to emergency situations.  Maintain good communication lines with the EERT to ensure prompt help response &amp; adequate protection, by keeping them informed of Project progress.</td></tr></tbody></table>		Entity	Responsibilities	EMP Team (ERT)	Communicates / alerts the EERT.  Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site.  When necessary & requested by the EERT, lends support / provides assistance during EERT's response operations	External Emergency Response Team (EERT)	Solves the emergency / incident	Resources	Provide and sustain the people, equipment, tools & funds necessary to ensure Project's quick response to emergency situations.  Maintain good communication lines with the EERT to ensure prompt help response & adequate protection, by keeping them informed of Project progress.
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	EMP Team (ERT)	Communicates / alerts the EERT.  Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site.  When necessary & requested by the EERT, lends support / provides assistance during EERT's response operations								
External Emergency Response Team (EERT)	Solves the emergency / incident									
Resources	Provide and sustain the people, equipment, tools & funds necessary to ensure Project's quick response to emergency situations.  Maintain good communication lines with the EERT to ensure prompt help response & adequate protection, by keeping them informed of Project progress.									
Content										
The most crucial aspect of the emergency system is the identification and communication of the emergency to the appropriate persons. Consequently, the names of the appropriate contact person together with their contact numbers would be prominently displayed around the facility. The contact details will be updated on a regular basis.										

	<p>Each person's responsibility would be cleared with him/her beforehand and a copy of the emergency contingency plan would be distributed to each person, including the responsible and/or affected persons not associated with the Operator:</p> <ul style="list-style-type: none"> <li>Disaster management and firefighting agencies;</li> <li>Downstream water supply authorities</li> <li>Downstream users that could be affected in the case of an emergency such as local communities</li> <li>Relevant government authorities; and</li> <li>Approved professional person (engineer).</li> </ul> <p>It must be ensured that operating and supervisory staff are familiar with the emergency plan, and that the content thereof is understood and familiar to them.</p> <p>The emergency response plan will be updated as circumstances change or operating procedures are amended, and as a minimum in the event of:</p> <ul style="list-style-type: none"> <li>Any additional recommendations made by a professional engineer (annual safety inspections) or environmental auditors;</li> <li>Any change in operational procedures and/or management of the project activity;</li> <li>The identification of any issues of concern or additional risks as a result of regular inspections and/or monitoring results; and</li> <li>Any unplanned or unforeseen emergency situation.</li> </ul> <p>Establish a planning team: Demonstrate management's commitment to the project by appointing a competent team leader and authorizing the leader and the team he assembles to take the necessary steps to develop an emergency response plan. Management should provide the leader with expectations for deliverables and a deadline and budget, if required.</p> <p>The team may elect to meet with municipal and provincial government agencies, first response organizations and others to obtain information. Meetings will also be held with other company personnel such as members, worker safety and health representatives, engineers, maintenance, human resources, purchasing and others.</p> <p>With management's directives and deadlines in mind, the team should also establish schedules and budget for their work and have these approved, if necessary.</p> <p>Training and competency: The level of training that project site personnel receive in emergency preparedness needs to be significantly increased. In particular emphasis should be placed on testing the whole emergency response system, especially under worst case scenarios such as night or weekend. There is an opportunity for providers of training in emergency management to develop courses for site personnel in emergency management for personnel other than for the major roles. This would generate a wider understanding of what happens in an emergency and what needs to happen in what order. Any whole of training in emergency management plans (EMP) should include the post incident analysis and investigation that may be required by the regulator.</p> <p>Documents to review:</p>
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	<p>Health and safety policy</p> <p>Evacuation plan</p> <p>Fire protection and fire-fighting plans</p> <p>Security procedures</p> <p>Mutual aid agreements with other companies</p> <p>Risk management plan</p> <p>Records from previous incidents and drills</p> <p>Environmental policies</p> <p>Accident investigation records</p> <p>Records of past meetings with first responders (fire, police, medical, etc.)</p> <p>Identify hazards, estimate probability and assess potential impact on people, property and business.</p> <p>A good starting point is to create an inventory of emergencies which have or could have occurred in:</p> <ul style="list-style-type: none"> <li>Your facility</li> <li>The area adjacent to your facility</li> <li>The community</li> <li>The region</li> </ul> <p>Include the following if appropriate:</p> <ul style="list-style-type: none"> <li>Fire</li> <li>Chemical spills and leaks</li> <li>Hazardous materials</li> <li>Extreme weather</li> <li>Explosion</li> <li>Electrical emergency</li> <li>Water hazards and floods</li> <li>Mobile equipment</li> <li>Conveyor emergencies</li> <li>Confined space</li> <li>Widespread illness or pandemic</li> <li>Other(s)</li> </ul> <p>Take into account such factors as:</p> <ul style="list-style-type: none"> <li>Patterns of extreme weather such as freezing rain, drought, cyclones, excessive rain</li> <li>Proximity to flood plains, seismic faults, dams, water tables</li> <li>Proximity to companies which produce, use, store or transport dangerous goods</li> <li>The state of the roads leading to and from your facility – are they ever impassable due to heavy mist or reduced visibility – what is the local accident frequency?</li> <li>For isolated operations, the availability of emergency transportation such as ambulance or helicopter</li> <li>Typical employee drive time to and from work</li> </ul> <p>Identify emergency resources: More than listing telephone numbers in the emergency procedure, many companies maintain an active relationship with some or all emergency services, providing them with site plans, plant tours and notification when there are major changes to plant, process or materials. Many fire departments, for example, would</p>
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	<p>welcome an opportunity to conduct a training session regarding footwear production work.</p> <p>Resources include but may not be limited to:</p> <p>Fire: may be full-time professional fire fighters; part-time volunteer departments; company employees trained and equipped to fight fires.</p> <p>Police: municipal or First National police forces</p> <p>SAR – Search and Rescue: teams of trained and equipped volunteers prepared to search for missing persons or respond to other types of emergencies</p> <p>Medical: provincial or local ambulance service; hospital; local doctor; air ambulance; company employees trained and equipped to provide first aid</p> <p>Municipal government, public works department: may provide assistance with situations involving water, sewer, or other services – may already have plans in place for large scale emergencies</p> <p>Electrical utility: Local municipal or regional electricity utility may provide assistance with situations involving overhead or underground power lines</p> <p>Telephone utility may be required to provide assistance with situations involving telephone or related service or telephone equipment</p> <p>Fuel supplier may be required to provide assistance with situations involving fuel, fuel storage or fuel transfer.</p> <p>Ministry of Labor may be consulted</p> <p>Ministry of the Environment: advice and assistance with situations involving release of materials into the air, water or ground.</p> <p>Review codes and regulations: Some emergency situations may be caused or complicated by failing to follow the dictates of one or more codes of practice. Legislation is in place to direct companies on procedures to follow and notification to be given in case of an emergency. Codes and regulations include but may not be limited to:</p> <ul style="list-style-type: none"> <li>▪ National Fire Code: details fire prevention characteristics to be included in residential and commercial buildings as well as installation, testing and use of fire emergency systems ,</li> <li>▪ National Fire Protection Agency (NFPA 58) standard.</li> </ul> <p>Develop training programs: Everyone who works for the company requires some type of training. Even contractors and visitors may require some emergency response training and orientation.</p> <p>Training may include safety meetings, reviews of procedures, use of fire extinguishers, evacuation drills or full-scale disaster exercises. Some or all employees may be trained in fire preventive and emergency first aid training is already mandatory.</p> <p>Typically, a company will assign someone to be responsible for managing the emergency response training program. The training plan should speak to the following considerations:</p> <ul style="list-style-type: none"> <li>Who is to be trained</li> <li>Who will do the training; employees, contractors, community responders</li> <li>What training is required for all employees</li> <li>What training is required for specialist employees</li> <li>What training is required for contractors and their employees</li> </ul>
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	<p>What orientation training is required for visitors</p> <p>How can members of the community first response teams be involved with the training programs</p> <p>How to evaluate training and re-training intervals</p> <p>The method of storing and the location of the training records</p> <p>Develop a communication strategy: Effective communication is essential to report emergencies to first response support teams, employees, neighboring businesses and residences, the community, news media and other interested parties such as employees' families and company customers. Even a temporary communication disruption can have a serious effect on the response process. An Emergency Response Organization Chart can play a major role in maintaining effective communication especially during a crisis.</p> <p>The first requirement is a means for alerting all personnel on the site to the emergency. A loud, open-air horn or siren may be effective for most people but operators inside cabs of mobile vehicles may not hear the warning especially if they have air conditioning running at the time. A general alert delivered on all working radio frequencies is effective. The system should be tested on a regularly-scheduled basis. Each employee participate in a fire drill at least once per year. Employees should know where to go when the alarm is sounded.</p> <p>Some notifications are required by law. A list of "Legislated Requirements for Incident Reporting" is included with this guideline as an addendum. Note that, in some cases, "immediate notification" is required. Someone on the emergency team should have responsibility for making reports as required by legislation.</p> <p>Dealing with the news media at the time of an emergency situation can present a special challenge. Experts recommend only one trained person be allowed to brief the media on behalf of the company. Media representatives should not be given free access to the job site. They must be provided with PPE and escorted at all times for their own safety. Where possible, information for media distribution should be printed and distributed as a press release.</p> <p>Write the plan: Every component of every emergency response plan requires the approval of some level of management. Plan development will proceed more smoothly and with fewer revisions if the approvals process and deadlines are established and understood beforehand.</p> <p>Not everyone is capable of writing clear, concise copy. Encourage everyone participating in the actual plan development to record information in point form. The project leader should assign the writing tasks to those who are most knowledgeable about sections of the content.</p> <p>Working from your lists of probable emergencies and resources available, develop an approach to deal with the situations. Include a step-by-step procedure, and state who is responsible for taking which actions.</p>
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	<p>Implement the plan: There are several aspects to plan implementation:</p> <p>Management can indicate its “buy-in” to the plan by adding a launch covering letter signed and dated by the most senior manager for the site or operation</p> <p>The employee introduction to the emergency plan may take place through safety meetings, orientation meetings or specific training programs</p> <p>Emergency preparedness information from the plan may be distributed or promoted through posters, bulletin board showings and employee newsletters</p> <p>Supervisors should make a habit of asking employees what they would do if a fire (explosion, cyclone, etc.) occurred.</p> <p>Plan implementation should include a launch with police, fire, medical and other support services</p> <p>Emergency Training: One day of the week-long pre-production startup program will be devoted to refresher training in emergency procedures, fire-fighting and related programs. An emergency evacuation drill will be held at least once during production season.</p> <p>Fire Protection and Fire Fighting Plan: All employees will follow the procedure:</p> <p>In the event of a fire in equipment which has a built-in fire suppression system, (loaders, gen set) activate the system.</p> <p>If you discover a fire in its early stage, notify the office by radio then make the decision whether to fight it with a fire extinguisher – all employees should be familiar with extinguisher locations and how to use them – when in doubt evacuate.</p> <p>For any fire which cannot be fought with hand-held extinguishers, the local municipal fire department will be called – if required, an employee will be designated to lead the fire department to the scene of the fire using a company truck. The company has offered its property for fire fighter training purposes.</p> <p>Incident and Injury Plan: First aid kits are located at the site plant, gen set trailer and in each company vehicle.</p> <p>For minor injuries (scrapes, shallow cuts, etc.) all employees are authorized to use materials in any first aid kit but must make a note of the injury and materials used in the kit's log book.</p> <p>For any injury more serious than the above, call the office for assistance. Current-trained first-aiders will determine whether an injury can be treated on site, treated in hospital or requires an ambulance.</p> <p>Security Procedures: Only the main gate will be opened for vehicle access. All other gates at entries to the property will be closed and locked at all times. Report any damage to gates or perimeter fences</p> <p>Incoming customer trucks for pickup must stop at the office. Drivers are not allowed to leave the cabs of their vehicles at any time while on Company property. All other visitors are required to park near the office for check-in and check-out when leaving. All visiting vehicles must be accompanied by a Company vehicle when traveling on company property. Hard hats and safety glasses are available for visitors in the office. No explosives are stored on the company property.</p>
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	<p>Interruption of Electrical Supply: Electrical systems in the office are designed to switch over to power supplied by our generators in the event of a failure of utility-supplied power.</p> <p>Emergency response and preparedness: If Accidents, injuries or health effects and natural disasters occur during the operation, must be prepared to act in a timely manner. In case of emergencies, the first-aid nurses in the workplace and the clinic staff will take charge; and patients will be treated and must be taken to the nearest hospital for a serious condition.</p>
Monitoring Plan	<p>There are several aspects to Monitoring plan:</p> <p>Management can indicate its “buy-in” to the plan by adding a launch covering letter signed and dated by the most senior manager for the site or operation</p> <p>The employee introduction to the emergency plan may take place through safety meetings, orientation meetings or specific training programs</p> <p>Emergency preparedness information from the plan may be distributed or promoted through posters, bulletin board showings and employee newsletters</p> <p>Supervisors should make a habit of asking employees what they would do if a fire (explosion, cyclone, etc.) occurred.</p> <p>Plan implementation should include a launch with police, fire, medical and other support services</p>
Location	Direct Affected Area
Frequency	Regularly Monitoring and Quarterly Reporting
Budget Allocation	2,400,000 Kyats (Lump sum/year)
Responsibilities	Monitoring by EMP Organization or Third Party

### **8.9 Corporate Social Responsibility (CSR) and Funding**

In the implementation of the CSR, the contribution made by society through the business activities and investment of the company has improved many years ago throughout the world. CSR is a social, environmental and an effect of various economic pressures.

Development Companies should also share some of the benefits of the business with the social, economic, education, health and environmental benefits of the local people and employees. By contributing these activities, it will facilitate better relations between the locals and the company. Therefore, the company should interview the people and the authorities from the local village and take care of their needs.

The project proponent shall use maximum 2% of annual net profit to be allocated as CSR fund starting from the project operation. It is basically suggested to be funded at around 10 lakh kyats. The amount should be contributed in factors tentatively as an example like; 350,000 kyats per year in

education, 300,000 kyats per year in health care and 350,000 kyats per year in protection of environment.

#### **8.10 Restoration and Replantation plan**

- (1) In the field, nursery garden shall be established seedlings for planting substitutes
- (2) Measuring the area for planting suitable trees in the region with the guidance of the relevant township department of forestry.
- (3) Planting seedlings in designated areas.
- (4) Maintaining the water that comes from the production through the sewer pond for watering.
- (5) Employment of a local day laborer to monitor the growth of the plant.
- (6) As a daily laborer should be monitored and replaced of crop failure and other condition.
- (7) The company will provide support to local daily laborers who will look after the trees.

***Table 8.1: Annual Replantation Programme***

No.	Year	Planned Green Area (m <sup>2</sup> )	Project Area	Arable Area (m <sup>2</sup> )	Total Seedlings
	First	200	Native Perennial Trees / Floriculture	200	10
	Second	200	Native Perennial Trees / Floriculture	200	10
	Third	200	Native Perennial Trees / Floriculture	200	15
	Fourth	200	Native Perennial Trees / Floriculture	200	15
Project's Total Planned Green Area = 10% of Project Area		800		800	

#### **8.10 Environmental Monitoring Plan**

For the Aqua Feed production, both construction and operation phases requires an adequate level of monitoring to ensure a safe and healthy environment.

It is important that the environmental works should be supervised and monitored at all times, in order to ensure that the greatest possible benefits are gained from the Environmental Management process. General guidelines are provided below, as to how the EMP can be managed and monitored.

The Consultant recommends that a person responsible for Environmental management at all works sites, should be seconded to the work program.

This person should have adequate experience in environmental management, and in dealing with relevant project works. This person would also have knowledge in monitoring social / occupational health issues, both on site and with adjacent areas, associated with aqua feed production work and protection of the environment.



#### ***8.10.1 Site Inspection and Audits***

The contractor must develop appropriate protocols for regular site inspections and monitor compliance with environmental and social legislation and best practice, which includes World Bank safeguards standards. The project proponent personnel should participate in this process in the context of capacity building for environmental management.

**Table 8.2: Environmental Monitoring Plan**

Indicator	Location and Data Collection	Frequency	Parameters		Institution		
Operation Phase							
Monitoring EMP Implementation							
1. Mitigation Measures 2. Enhancement Measures	Project Area (Direct Affected Area)	Daily monitoring and documenting, and Bi-Annual reporting			EMP Organization or Third Party		
3. Surface Water, Drinking water	Two samples (wastewater and drinking water) are measured to cover the whole Project Area	Twice per year	<ul style="list-style-type: none"><li>Turbidity, EC, Total hardness, Total dissolved Solids, Chloride, Sulfate, Calcium, Magnesium, BOD, COD, pH, Temperature, Ammonia for waste water;</li><li>Physico-Chemical parameters (e.g. Turbidity, EC, Total hardness, Total dissolved Solids, pH, Temperature, Iron (as Fe), SO<sub>4</sub>, Nitrates (as NO<sub>3</sub>), Fluoride (F), etc. and Microbiological parameters (E-coli and total coliforms) for drinking water.</li></ul>		EMP Organization or Third Party		
4. Drainage Management	Project Area (Direct Affected Area)	Daily	<ul style="list-style-type: none"><li>Good housekeeping and professional landscape and drainage design</li></ul>		EMP Organization or Third Party		
5. Air	One sample is measured to cover the whole Project Area	Yearly	<ul style="list-style-type: none"><li>Nitrogen dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), Particulate Matter (PM<sub>10</sub>), Particulate Matter (PM<sub>2.5</sub>), Sulfur dioxide (SO<sub>2</sub>), Total Suspend Particulate (TSP), CO, Temp, Relative Humidity.</li></ul>		EMP Organization or Third Party		
6. Noise and Vibration	One sample is measured to cover the whole Project Area	Yearly	<div>NEQEG Noise Level Parameters</div> <table><tr><td>Receptor</td><td>One hour LAeq (dBA)<sup>a</sup></td></tr></table>		Receptor	One hour LAeq (dBA) <sup>a</sup>	EMP Organization or Third Party
Receptor	One hour LAeq (dBA) <sup>a</sup>						

				Daytime 07:00 – 22:00 (10:00 - 22:00 for Public holidays)	Night Time 22:00 – 07:00 (22:00 - 10:00 for Public holidays)	
			Residential, institutional, educational	55	45	
			Industrial, commercial	70	70	
			an Equivalent continuous sound level in decibels			
7. Waste Management	the whole Project Area	Weekly	Waste generated at the Project is monitored on a monthly basis through waste disposal receipts			EMP Organization or Third Party
8. Traffic Management	Transportation Route	Daily				EMP Organization or Third Party
9. Community Engagement	Direct Effected Area and In-directed Affected Area	Regularly Monitoring and Quarterly Reporting				EMP Organization or Third Party
10. Occupational Health and Safety	Direct Effected Area	Regularly Monitoring and Quarterly Reporting				EMP Organization or Third Party
11. Emergency and Rescue Plan	Direct Effected Area	Regularly Monitoring and Quarterly Reporting				EMP Organization or Third Party

### 8.11 EMP and Monitoring Budget Estimate (Operational Phase)

The estimated costs of developing a monitoring program are as follows:

**Table 8.3: Environmental Management Plan and Monitoring Cost Estimate (Operational Phase)**

#### **Estimated Environmental Management and Monitoring Cost (Operational Phase)**

<b>Section</b>	<b>Description of Monitoring Cost</b>	<b>Unit Cost (Ks)</b>	<b>Unit</b>	<b>Amount (Ks)</b>	<b>Note</b>
8.1	Water Quality Management Plan	100,000	2x2	400,000	Yearly
8.2	Drainage Management Plan	500,000	1	500,000	Yearly
8.3	Air Quality (including Noise) Management Plan	1,500,000	1	1,500,000	Yearly
8.4	Waste Management Plan	300,000	12	3,600,000	Yearly
8.5	Traffic Management Plan	500,000	1	500,000	Yearly
8.6	Community Engagement and Health Care Plan	700,000	1	700,000	Yearly
8.7	Occupational Health and Safety Plan	2,400,000	1	2,400,000	Yearly
8.8	Emergency Response Plan	2,400,000	1	2,400,000	Yearly
8.9	Corporate Social Responsibility Plan	1,000,000	1	1,000,000	Yearly
6.5	Salary for EMO and ESO (EMP Organization)	700,000	12	8,400,000	Yearly
810	Restoration and Replantation Programme	500,000	1	500,000	Yearly
Total Estimated Annual Budget for EMP and Monitoring (Kyats)				21,900,000	Kyats

**Say 22,000,000 Kyats**

**Estimated Annual Budget Allocation for EMP and Monitoring is 22,000,000 Kyats (Twenty-Two Million Kyats only)**

**Note:** If the project is beyond the current estimated cost, the necessary funds will be expanded. The Environmental Auditor is assumed to be from project proponent's office. However, if some of the works have already been in place, the EMP Budget may be duly budgeted accordingly by the EMO.

## 9. Public Consultation and Disclosure

### 9.1 Methodology and Approach

The public consultation and awareness program has involved a three tier process:

- i) Informal meetings held at Household and Ward level (socio economic surveys) in the proposed areas of works;
- ii) Ad hoc discussions with key Government agencies and NGOs as appropriate;
- iii) A formal Workshop / Consultation Meeting(s) for key stakeholders held to present the draft report findings. There is no human habitation inside or along the proposed project area. There is no issue of resettlement planning. However, community awareness should focus on activities below.

### 9.2 Summary of Consultations and Activities undertaken

*Table 9.1: Summary of Consultation Required*

Activity	Expected Result	Schedule	Cost
Consult local managerial levels about conditions of construction sites	Information about the areas where may exist toxic substances, cultural heritages and underground structures	During planning and design period (already conducted)	PMU Cost
Disseminate information to local community via appropriate means	Informing communities about construction activities, works schedules, potential health and safety issues and how to engage with the project for any grievances	During the construction phase	PMU Cost
Community redress mechanism is established.	PMU/ESMU and Contractors shall have to reply to all complaints, questions or concerns of local communities about the works.	During the construction phase.	
Community redress mechanism is established by the works operation and management unit	Replying to questions, complaints or concerns of the communities on operation	During the operation phase	PMU Cost
Consult the local authorities	Agreeing with EMP mitigation measures	From the project operation	PMU Cost

**Table 9.2: Summary Notes on Key Informant Interview on 7 May – 4 June 2019**

Item	Name of Key Informant	Designation / Organization	Discussion Notes
Date: 7 May 2019			
1	Khin Mi Mi Zin (Ms. Kimmy)	Quality Assurance Manager, De Heus Myanmar Ltd.	<p>1) The Proposed project aims to produce aqua fish feed for cultured fresh water fish such as Parker CS Fish, a kind of Slavia species.</p> <p>2) Some of the raw materials such as soybean meal, corn, wheat and barley are expected to be imported; the coconut oil or palm oil necessary for the production process will be bought locally or imported according to project needs;</p> <p>3) There are two tube wells in the project premises and the wells water will be utilized for processing of the fish feed;</p> <p>4) The wells water have high iron content and it is treated by carbon filtration and ionization methods;</p>
2	U Chan Myae Aung Soe	Deputy Plant Manager, De Heus Myanmar Ltd.	<p>1) The Project's water demand is 8m<sup>3</sup>/hr and will be provided by the two tube well in the project premises;</p> <p>2) The machinery used in the animal feed and aqua feed will be different although the basic process is quite similar.</p> <p>3) The aqua feed product needs to be floating so that the fish can acquire the feed easily;</p> <p>4) The detailed process of aqua feed will be explained when the consultant visits the animal feed mill during the forthcoming social survey in June 2019.</p>
3	Daw Wah Wah Kyaw (Ms. Scarlet)	Senior Quality Assurance Officer, De Heus Myanmar Ltd.	<p>1) The De Heus Factory Site is about 10 acres; with Animal feed premises being 5.5 acres and Aqua Feed Mill premises being 5.5 acres.</p> <p>2) The solid waste from the project will be collected by the Local Municipality twice a day. For recycling, iron / steel and plastic waste will be bought by waste recycling contractors;</p> <p>3) There is hardly any waste from the processing plant as the by product are reused in the manufacturing process;</p>



Date: 4 June 2019			
4	U Ye Min Paing	Maintenance Engineer, De Heus Myanmar Ltd.	<p>The process of the Aqua feed production is:</p> <p>The raw materials from the raw materials silo are sent to the raw intake structure to be batched and weighed for a specific aqua feed product. Then sent to the grinding machine and mixed with oil (coconut / palm) and grind for two main products: Pellets and Crumble Mix. After grinding, it is sent to the Extrusion Machine for its different product, then to dried and coated and sent to the Product Silo to be weighed and packed ready for dispatch to end user.</p>
5	U Kyaw Kyaw Htet (Roger Lin)	HSE Officer, De Heus Myanmar Ltd.	I shall send you the De Heus Myanmar Fire Hazard Preventio plan, Emergency Response Plan, Staff Health Plan of De Heus Myanmar Ltd. In the near future.
6	U Myo Thant	Civil Engineer, De Heus Myanmar Ltd.	<p>1) We have laid the foundation and are constructing the Production Tower over there as you see, it is 9 storey building consisting of various steps of the production process. As shown in this Master Plan of the Aqua Feed Mill Factory Site Plan, the infrastructure components consists of 1) intake building (235 m<sup>2</sup>), Production Tower 9 storey building (4741.34 m<sup>2</sup>), Dosing Silo (176.99 m<sup>2</sup>), Corn Silo (429.20 m<sup>2</sup>), Wheat Silo (142.50 m<sup>2</sup>), Raw Material Warehouse (2791.25 m<sup>2</sup>), Finished Product Warehouse (3030,50 m<sup>2</sup>), Empty Bag Storage (350.11m<sup>2</sup>), Liquid Tank (116.08 m<sup>2</sup>), Transformer 2000 KVA (96.50 m<sup>2</sup>), Ash Storage (72.75 m<sup>2</sup>), Steam Boiler (219.38 m2), Workshop (200m<sup>2</sup>), Toilet (9m<sup>2</sup>), Bike Parking (176m<sup>2</sup>), existing and new internal road and greenery area.</p> <p>2) We have drilled one tube well which is 400 ft deep. It yields fresh water. I shall send you the well details later. You can take this well water sample for analysis.</p> <p>3) We have also installed a transformer to regulate the electrical power received from the Myaung Dagar Industrial Zone for project implementation.</p> <p>4) We have a water pond constructed for fire hazard prevention and emergency use.</p>

### 9.3 Summary Notes on the Pre Stakeholders Meeting and Results of Consultation

**Venue :** Meeting Hall, De Heus Myanmar Limited, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

**Date :** 29 June 2019

**Time :** 1:00 – 3.00 p.m.

**Number of Participants:** 21 participants (Local Government officials 5, Hmawbi Township Parliamentary Member 1, Interested Stakeholder / Local Elder representative 4, De Heus Myanmar Limited Staff 4, NEPS 7)

**Organized by:** NEPS (National Engineering and Planning Services) in corporation with De Heus Myanmar Limited and project's proponents

***Table 9.3: Summary Notes on Pre Stakeholders Meeting on 29 June 2019***

<b><i>Item</i></b>	<b><i>Name of Participant at Stakeholders Meeting</i></b>	<b><i>Designation / Organization</i></b>	<b><i>Discussion Notes</i></b>
1	U Aye Myint	Team Leader, Environmental Team, NEPS	1) Today's Meeting is held to explain the projects' works on Aqua Feed Mill Project that will be implemented by De Heus Myanmar Limited and for the pre stakeholders meeting for the environmental impact assessment work of this project. 2) The project proponent will explain about the proposed project and we, the third party organization will update our progress made regarding to environmental and social impact assessment on this project. 3) Today's meeting had been publically and legally announced in the newspaper ahead of this meeting date. 4) I want to encourage all participants to freely ask questions of anything that needs clarification and to discuss transparently at this meeting. Thank you.
2	Leo Zaw	De Heus Myanmar Limited	Greetings to you all! I would like to explain the preparations made for the construction and the implementation phase of this project: 1) De Heus Products started since 2013. However, in 2016, the existing animal feed mill (not the new aqua feed mill) was constructed here and another animal feed mill factory at Mandalay. We plan to open more factories.

			<p>2) De Heus is a Netherlands-based company and we abide to the rules and regulations regarding conservation of the environment. We already have our environmental objectives and regulations to take care of our environment.</p> <p>3) Now the proposed project is to construct an aqua feed mill factory adjacent to this present animal feed mill. The two factories will operate separately. We will start with 53 staff.</p> <p>4) Initially, we plan to produce 5000 to 6000 tons per month. However, we plan to produce 15,000 tons per month later, in the future.</p> <p>5) We also have plans to install a wastewater treatment plant. For sanitation facilities, we will use the septic tank system.</p> <p>6) You are welcome to ask any questions needing clarification regarding this project. Thank you.</p>
3	Khin Thuzar Myint	Engineer, NEPS	<p>Greetings to you! I would like to explain about the environmental and social impact assessment work on the proposed project:</p> <p>1) The working steps are first, we collect baseline data for the environmental assessment regarding physical, biological, chemical and social status of the project site and its environment; then we identify the negative (adverse) and beneficial impacts of these different parameters.</p> <p>2) We carry out this impact assessment according to relevant rules and regulations of our nation: The EIA Procedure 2015, Environmental Conservation Law 2012 and Environmental Conservation Rules Notification 2014.</p> <p>3) The air quality, water quality, the noise levels will be assessed according to our National Environmental Quality (emission) Guideline, 2015, issued from ECD (Environmental Conservation Department).</p> <p>4) We have also carried out social survey on the two nearby villages: Konegalay and Kangalay villages near the project site.</p>
4	U Aung Win	Parliamentary Representative,	<p>1) Our country's weakest part is in achieving good drainage system. Therefore, there are many</p>

		Hmawbi Township	<p>difficulties to effectively carry out waste water treatment system and achieve proper drainage here.</p> <p>2) Our Hmawbi township has many environmental problems. However, I presume this proposed project's values and aims are environmentally friendly and trust that its construction and implementation will not highly affect the environment adversely.</p> <p>3) Here, in this Myaung Dagar Industrial Zone, there are problems of squatters staying in this premises. With the cooperation of all zone committee members and factories responsible personnels, we will have to successfully solve these problems.</p>
5	U Soe Win	Hmawbi Township Development Committee Official (Municipality)	<p>1) I am an officer from the Municipality of Hmawbi Township and also responsible for the Myaung Dagar Industrial Zone.</p> <p>2) We plan to install a waste water treatment system (oxidation pond) for the whole Industrial Zone area.</p> <p>3) The Hmawbi Township Development Committee hopes to get all respective factory personnel, Industrial Zone stakeholders and relevant Government Officials to cooperate and support the Committee's effort in achieving environmental sustainability in this area. Thank you.</p>
6	U Aye Myint	Environmental Team Leader, NEPS Co., Ltd.	When we prepare our reports, we include Monitoring Plans with recommendations to monitor the project operation; so that the implementation of the project is carried out to sustain and conserve the environment.
7	U Moe	Local Elder Representative	<p>I would like to request that job opportunities be available for local people in this proposed project.</p> <p>I would also like to request the project proponent to help support our local villages in development works socially, physically and environmentally. Thank you.</p>
8	U Aye Myint	Environmental Team Leader, NEPS Co., Ltd.	<p>1) In our environmental projects, we have CSR (Corporate Social Responsibility), of which the project proponent supports the local communities for their social development.</p> <p>2) Generally, 2% of the net profit of the project is being allotted for the local community development works.</p> <p>3) Depending upon the scale of the project and its net</p>

			profit, community development works are carried out according to their need.
9	Leo Zaw	De Heus Myanmar Limited	<p>1) We have one CSR Project Manager. Since the project proponent is of European origin, education and health sectors will be the priority for CSR project support.</p> <p>2) Presently, we have carried out eye health care in the local communities. We have already distributed 60 eye glasses for clear vision of the inhabitants.</p> <p>3) Moreover, eye check-up and eye operation for clear vision of the communities are being carried out by relevant professional health care personnels.</p>
10	U Maung Zaw	Kan Galay Village Administration Officer	<p>1) Although we have electricity inside this Myaung Dagar Industrial Zone, our Kan Galay Village, which is adjacent to this Industrial Zone does not have electricity as yet. Therefore, I would like to request your help to provide us with electricity.</p> <p>2) Also I would like you to help us with good drainage system in our village. Thank you.</p>
11	Leo Zaw	De Heus Myanmar Limited	<p>1) For this project, we plan to get the factory and its premises cleaned, construct proper drainage system and maintain the road lamps on a monthly basis.</p> <p>2) However, for the whole of Myaung Dagar Industrial Zone, the responsible zone committee with all factories concerned will cooperate to maintain and operate the zone activities.</p>
12	U Kyi Lwin	Local Elder Representative	<p>1) We would like to request you to solve the problem of the slow-down concrete ramps on the zone road in front of your factory, of which many cyclists from our villages encounter accidents while travelling.</p> <p>2) Furthermore, because this road is only two-lane path, it becomes congested when the container-vehicles park on the road; resulting in risk of accidents for the other vehicles and travellers.</p>
13	Leo Zaw	De Heus Myanmar Limited	<p>1) For the huge vehicles that come to our compound, we have parking lots inside our premises. However, because of weakness in monitoring of vehicles and adhering to traffic rules, this problem arises. We will do our best to keep the road clear for other vehicles to travel.</p>

			2) For the slow-down concrete, we have repaired them two times within this month. I do hope that this will be convenient for all travellers and that cycling will be safe on the road.
14	U Aung Thura	Deputy Township Administrator, Hmawbi Township Administrative Office	For our locality, we warmly welcome new factory establishment. Therefore, it is important to prevent and avoid any employer-employee problems before they arise.
15	Leo Zaw	De Heus Myanmar Limited	For our project, we will abide and work according to the standing National Labor Laws and Regulations and oversee that all workers are safe and well with occupational health.
16	U Aye Myint	Team Leader, Environmental Team, NEPS	Thank you all for participating enthusiastically in this Pre Stakeholders Meeting. The aim of this meeting is to meet face to face with all stakeholders and inform, discuss with each other; our aspirations, problems and needs to successfully find solutions and work together towards the good and well being of all concerned. It is important to consider all aspects and parameters to find a sound solution that will conserve the environment and enhance the social development of this locality and our nation. Thank you.
Since there were no further queries and concerns from the participants of the Stakeholders Meeting, the meeting came to a close at 3:00 p.m.			



#### 9.4 Further Ongoing Consultations: Summary Notes on KII after Scoping Report Approval from ECD

After De Heus Aquafeed Mill Scoping Report for ESIA works has been approved by the ECD, with directives to follow (9/9/2021), the ongoing tasks for ESIA works are being resumed in Nov – Dec 2021 with site visits to the project site and Key Informant interviews carried out to update the works for completion of the assignment.

Plans for the upcoming PCM are also being discussed with the project proponent representatives and other stakeholders. The summary notes of the KII during Nov-Dec 2021 are described in the following table.

**Table 9.4: Summary Notes of the KII during Nov-Dec 2021**

<i>Item</i>	<i>Name of Key Informant</i>	<i>Designation / Organization</i>	<i>Discussion Notes</i>
Date: 6 Dec 2021			
1	U Ye Min Paing	Deputy Plant Manager, De Heus Myanmar Ltd.	<p>The Aqua Feed Mill Factory Construction is now 100% completed and we are now in our operational phase.</p> <p><b>For project design alternative</b>, initially the project installed only two production lines three years ago. However, due to the end-user demand, the project has installed additional two more production lines. So now, we have altogether four production lines. All stages in the production process are mechanized and they are all closed-type dry process. The Aqua Feed Mill production process is as follows:</p> <ol style="list-style-type: none"> <li>1) <b>Stage 1: Receiving Stage:</b> The raw materials from the Flat Storage and Silo are received at this stage;</li> <li>2) <b>Stage 2: Intake Stage:</b> Impurities / metals are attracted by magnet and separated from the raw material. Then it is weighed and sent to respective Silo;</li> <li>3) <b>Stage 3: Pre-mix stage:</b> Weighed Additives / Vitamins are added according to specification.</li> <li>4) <b>Stage 4: Dry mixing</b> takes place.</li> <li>5) <b>Stage 5: Grinding:</b> Magnet is used to take away impurities. Then Grinding takes place;</li> <li>6) <b>Stage 6: Wet Mix</b> takes place. This is adding oil and mixing thoroughly. The magnet here is of very high metal detection power. Then the product is weigh with scale and then conditioned with steam and water to soften, ready for extrusion process.</li> </ol>

			<p>7) <b>Stage 7: Extrusion:</b> The extruder has screw inside. The softened product is passed through the extruder with designed diameter size and operates with its shear force to produce a floating and less volume aqua feed product;</p> <p>8) <b>Stage 8: Drying:</b> Then the product is sent for drying until the moisture is gone. Then it is sieved and all the rejects (over-sized / under-sized) are sent to the respective silos. Then the designed sized dry product is weighed on scales;</p> <p>9) <b>Stage 9: Coating / Enrobing:</b> The weighed correct-size dry aqua feed is coated with specific oil for attracting the fish. It is called Fat-Coater.</p> <p>10) <b>Stage 10: Cooling:</b> Then the finished product is passed through the Cooler machines, after which it is sent to the FP (Finished Product) Silo. At the FP Silo, the FP is again passed through sieves for accuracy of designed size;</p> <p>11) <b>Stage 11: Packing:</b> The FP is weighed again for desired quantity, for example, 20kg, 40kg, 50 kg, etc. Then they are sent for packing. Each package of specific weight is adorned with two plastic bags plus outer impervious white bag labelled with relevant product name, ingredient, size, composition, manufacture and expiry date, etc. All Aqua feed outer packing bags are illuminated and impervious to ensure the sale product is dry and in perfect condition.</p> <p>12) <b>Stage 12: Finished Product:</b> The packed FP is then sent to the FP Warehouse (for Storage)</p> <p>Although some raw materials are being imported, all Aqua Feed products from this factory are sent to local end users. According to end user demand, we have 24 hour schedule including night shifts. When we reach our demand capacity, we stop our production. There is also a maintenance plan every week.</p> <p>There is a good professional sale-plan in place at De Heus so that there is no wastage nor undesirable economic burden.</p>
2	Mr. Steven Si	Quality	Site Visit to the various buildings / infrastructures in the

	Thu Oo	Assurance Officer, De Heus Myanmar Ltd.	<p>Aqua Feed Mill Factory compound:</p> <p><b>Flat Storage:</b> Here, the raw materials: some imported, such as soybean meal (e.g. from Thailand, Singapore, etc.), some, such as broken rice from local sources (e.g. Wilmar, Khin Mg Kyaw, etc.) are stored on the racks upon the floor. There is humidity monitor to ensure the raw materials are dry and in good condition. Now, the monitor is showing 57% humidity and temperature is 25°C in this flat storage warehouse;</p> <ol style="list-style-type: none"> <li>1) <b>Flat Storage Intake: Pre-mix.</b> This is adding the required vitamins or additives in the raw materials according to specification.</li> <li>2) <b>Additives Storage:</b> this warehouse is air conditioned and is called Cold Storage. We store the pre-mix or additives (e.g. choline chloride 60% powder, sweet whey powder, etc.) in this room. The expiry dates are duly monitored to ensure all that we do are according to GMP (Good Manufacturing Practice) and adheres to professional nutritious feed. The humidity monitor is showing temperature 19.2°C and humidity in this room is 57%. Most of the additives are imported. For example, Phyzym XP 5000L is an enzyme for fish digestion. The supplier is FIDANISCO.</li> <li>3) <b>Suppliers of raw materials:</b> De Heus makes sure that our suppliers are reliable and internationally esteemed for fish feed additives</li> <li>4) <b>Intake by Lift:</b> The Pre-Mix feed is uplifted to the seventh floor of the Production Tower to the pollution control machines.</li> <li>5) <b>The Production Tower:</b> is a nine storey building. There is elevator system to get to the seventh floor, where the pollution control machinery are installed.</li> </ol> <p>All machines in this Production Process is closed type and there are specific equipment to capture the emitted odour or particulate matter. There are also silencer installed to prevent undesirable noise levels. There are magnets installed in specific machines to attract iron, metal and impurities in</p>
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			<p>our raw material during production process; so that the aqua-feed finished product meets the required standard for safe feed. The following machineries are installed accordingly at each floor level:</p> <p><b>Seventh floor:</b> Pollution Control machines; where the raw materials pre-mix are shifted, separated from impurities;</p> <p><b>Sixth floor:</b> Coater where oil is added;</p> <p><b>Fifth floor:</b> Cooler, dryer, bins (storage tanks)</p> <p><b>Fourth floor:</b> magnets for metal; final stage sifter with standardized sieves;</p> <p><b>Third floor:</b> for reject and recycle in the production process;</p> <p><b>Second floor:</b> Steam, heat-insulation, wet mixer: addition of oil in wet mix (there is maintenance plan weekly)</p> <p>You can see that the Extruder is also a closed type machine. Inside, there is screw for extruding the wet mix to get the desired pallet / floating aqua feed.</p> <p><b>First floor:</b> Sifter, Finished product. The reject wet feed is recycled.</p> <p><b>Ground Floor:</b> Dosing bin (silo), Lecithin Oil silo, near the generator. RO WTP two nos. installed. Two Boilers installed near the WTPs.</p> <p>Between the two boilers, there is fuel pallet storage (dry husk pallet)</p> <p><b>Finished Product:</b> Here is the sample of our finished product in a) Pellet form and b) Crumble Mix form.</p>
3	U Thiri	HSE Officer, De Heus Myanmar Ltd.	<ol style="list-style-type: none"> <li>1) There is hardly any waste from the processing plant as the by-product are reused in the manufacturing process;</li> <li>2) As you can see in the Production Tower, all machinery are closed-type and pollution control equipment are utilized to capture the fugitive dust, odour emissions and particulate matter;</li> <li>3) As you can see, we have big exhaust fans installed in the production tower to takeout the bad air and also the louvers are opened to take in fresh</li> </ol>

			<p>air for good circulation of air during the production process;</p> <p>4) Our Production Tower machines have silencer installed to maintain the noise level. Moreover, we have heat-resistant walling sheet installed in each floor of the production tower;</p> <p>5) Till now, we do not have any accidents. Thanks to the factory discipline and preventive measures to stay safe both physically and emotionally;</p> <p>6) We regularly conduct fire-fighting drills with staff (once every year) since 2019 and now we are in the third year. We have the assembly point here in this front space of the factory yard between the livestock feed factory and ours. We have also the Master Plan for the firefighting system in place already.</p> <p>7) When there is emergency all staff are alerted by the alarm system, whereby everyone in the factory premises are to gather in this assembly point in the front yard. Then the security staff will check the head- count with roll call list. If anyone is missing according to the Emergency Response Plan, the rescue team rush into the factory to find the missing person(s).</p> <p>8) We have regular factory departmental leaders' meetings to discuss health and safety issues and briefings of different safety topics to discuss with the remaining team members in each department of the factory: e.g. seasonal flu, first aid, prevention of accidents, etc.</p> <p>9) We have five restrooms (toilets) for men at the Factory Compound. For the main admin building here, we have three restrooms for women and two restrooms for men.</p> <p>10) The tube well water from this factory is treated with Reverse Osmosis Water Treatment system and the treated water goes to the Boiler for utilizing steam in the Production Process.</p> <p>11) We use dry husk pallets as fuel for the Boiler. So it is an environmentally friendly process.</p>
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4	Mr. Scott Myo Win Htway	Quality Assurance, Food Technologist, De Heus Myanmar Ltd.	<ol style="list-style-type: none"> <li>1) The lunch time is 12:00 noon till 1:00 p.m. (one hour break);</li> <li>2) There is a separate messing hall for the staff;</li> <li>3) There is also a canteen, where we can buy our lunch if we missed the cooking from home;</li> <li>4) It takes around two hours to travel from Yangon to this Aquafeed Mill at Myaung Dagar IZ, so some of our staff choose to stay in Hmawbi town; within the Hmawbi Township, of which our factory is being located;</li> <li>5) Tonight, we have night shift in the Production Tower. The factory workers receive overtime allowances for the night duties served.</li> </ol>
5	Daw Ei Sandi Oo	Certified Nurse, De Heus Myanmar Ltd.	<ol style="list-style-type: none"> <li>1) I attend work during working hours from 8:00 a.m. till 5:00 p.m. There is ferry to and from factory during the five working days per week.</li> <li>2) The factory staff can come to me for checking blood pressure, or if they feel sick. For physician treatment, I forward the patient to the hospital / doctor and the factory transport takes them for further healthcare.</li> <li>3) My job is to ensure that the factory staff are healthy and has medical care;</li> <li>4) I take COVID 19 test for visitors and also regularly check the staff healthcare status to keep them in good health and well-being.</li> </ol>

### **9.5 Disclosure**

As per the requirements of the EIA Procedure, De Heus Myanmar will disclose any relevant information when conducting a PCM (Public Consultation Meeting) on the Project in two newspapers (one in English and one in Myanmar). Project information will be available on the De Heus Myanmar website and signboards will be posted at the site office.

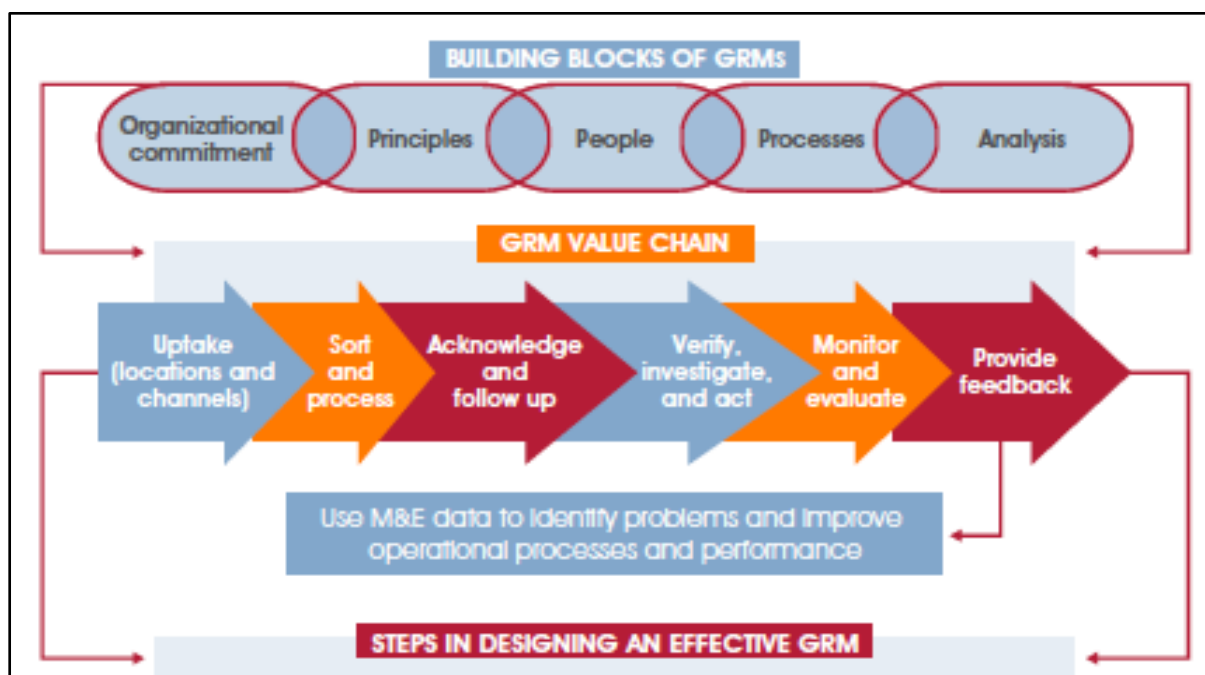
### **9.6 Grievance Redress Mechanism (GRM)**

A grievance redress mechanism (GRM) has been prepared for the Project with aim to create an enabling environment for affected communities and individuals to raise complaints to implementing entities in regard to the preparation and implementation of the project. The GRM will aim to resolve concerns promptly, in an impartial and transparent process tailored to the specific community, and at no cost and without retribution to the complainant(s). The GRM is based on the following six principles: 1) fairness; 2) objectiveness and independence; 3) simplicity and accessibility; 4)



responsiveness and efficiency; 5) speed and proportionality; 6) participatory and social inclusion<sup>48</sup>.

The GRM will be communicated to different stockholders. It is intended that information on the GRM will be disseminated widely in meetings and through pamphlets and brochures in Myanmar Language. Specifically, information will be provided about how and where to lodge complaints / grievance. Villagers / Local inhabitants will be encouraged to seek clarification or remediation through the *mechanism if they have any questions or complaints / grievances*.



Source: World Bank, *Feedback Matters: Designing Effective Grievance Redress Mechanisms for Bank-Financed Projects* p. 3

**Figure 25: Grievance Redress Mechanism Value Chain**

**9.6.1 Proposed Mechanism:** The Project Management Unit (PMU) of the project proponent will establish a Project Public Complaint Unit (PPCU) which will act as a central recording and coordinating unit in compliance with the National Environmental Conservation Law, 2012 and ADB's SPS (2009) requirement to prevent and address community concerns and assist the project to maximize environmental and social benefits. The PMU will ensure that a Grievance Redress Mechanism (GRM) is publicized locally so that the community is fully aware of the mechanism and the local points of entry to it. The setting up of the GRM in the PMU and its initial implementation through the PMUs will be supported by the Environmental Management Officer (EMO) of the project.

The GRM will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. Opportunities for confidentiality and privacy for complainants will be honoured where this is seen as important.

<sup>48</sup> Figure 18: Grievance Redress Mechanism Value Chain

When construction starts, a sign will be erected at each construction site providing the public with updated project information and summarizing the GRM process including details of the GRM entry points. The contact persons for different GRM entry points; PMU, nearby village administration leaders, contractors, and operators of project facilities, will be identified prior to construction. The contact details for the entry points (e.g. phone numbers, addresses, e-mail addresses, etc.) will be publicly disseminated on information boards at construction sites and on the website of the local government.

The preferred action sequence for complaints handling is that the complaint should be investigated and resolved by the unit receiving the complaint. If this is not possible, the complaint should be referred to the PMU (whose wider membership will enable coordinated action in response).

The PPCU will maintain records of complaints and actions taken to correct them. This data will be included in the PMU's reports to the relevant legal administrative authority (ECD / MIC). The PPCU will establish a GRM tracking and documentation system. The system will include the following elements: (i) tracking forms and procedures for gathering information from project personnel and complainant(s); (ii) staff to update the database routinely; (iii) systems with the capacity to analyse information so as to recognize grievance patterns, identify any systemic causes of grievances, promote transparency, publicize how complaints are being handled, and periodically evaluate the overall functioning of the mechanism; (iv) processes for informing stakeholders about the status of a case; and (v) procedures to retrieve data for reporting purposes.

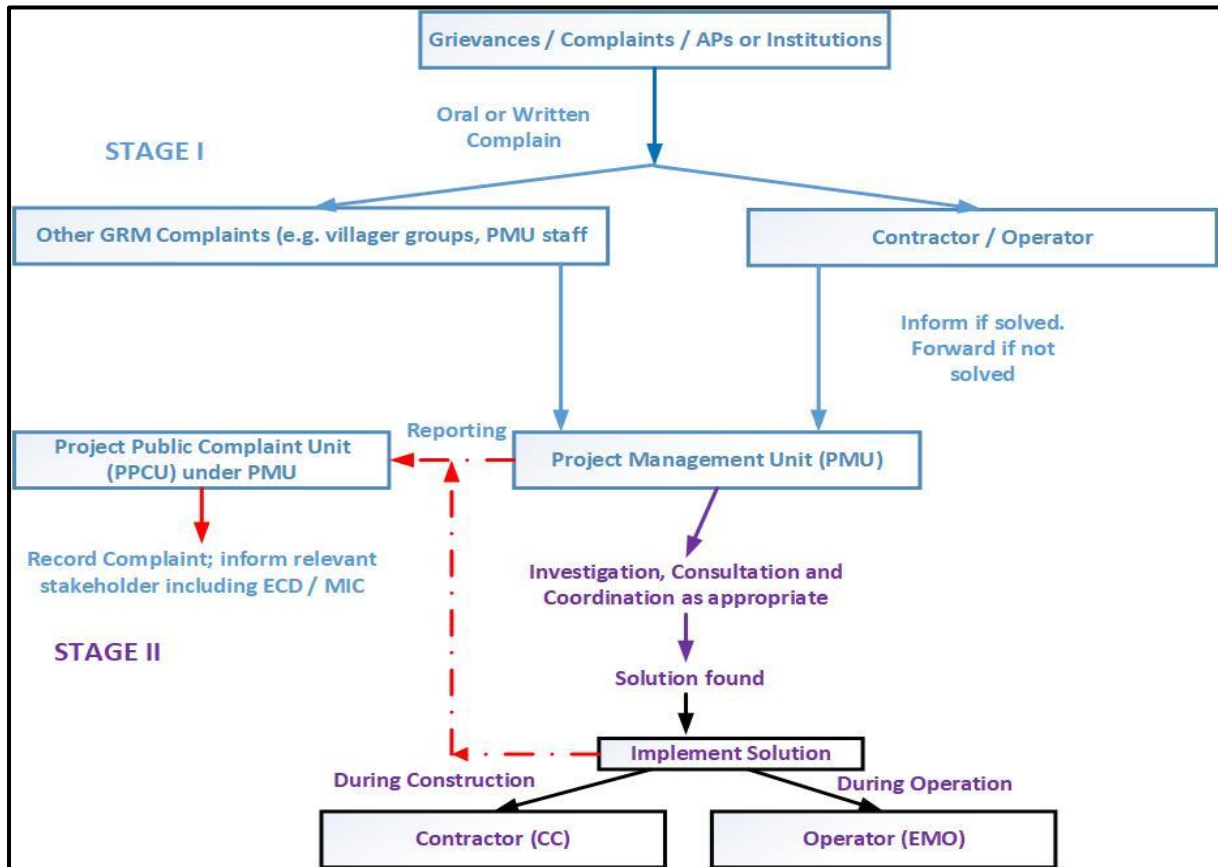
#### **9.6.2 GRM Procedure and Timeframe**

The procedure and timeframe for the grievance redress mechanism are described as follows (see Figures 26). The stages are represented by different colours in the flow diagram:

- (iii) **Stage 1:** If a concern arises during construction, the affected person will submit a written or oral complaint to the contractor directly. Whenever possible, the contractor will resolve the issue directly with the affected person. The contractor will give a clear reply within one week. If successful, the contractor will inform the PPCU accordingly.
- (iv) **Stage 2:** If no appropriate solution can be found, the contractor should forward the complaint to the PMU within five (5) working days. The complainant may also decide to submit a written or oral complaint to the PMU, either directly or via one of the GRM entry points. The PMU will investigate and identify the solution and provide a clear reply for the complainant within five (5) working days. The EMO of the project will assist the PMU in replying to the affected person. The PMU will timely convey the complaint/grievance and suggested solution to the contractors or operators of facilities. The contractors during construction and the operators during operation will implement the agreed upon redress solution and report the outcome to the PPCU within seven (7) working days.

**Note:** Since the project lies inside the Myaung Dagar Industrial Zone, and there are no local inhabitant(s) residing in the premises, a visible human settlement being observed only in the nearby villages of Kone Kalay and Kan Kalay villages, which are quite a distance (2-5 miles) of AOI (Area of

Influence), it is deemed that if there is any complaint / grievance of the AP (Affected Persons) due to the project implementation, the above procedures can be applied with the Operator / Environmental Management Officer (EMO) of the project; being the focal person to address the matter instead of the contractor / Construction contractor (CC).



**Figure 26: Grievance Redress Mechanism Procedure**

## 10. Conclusion and Recommendations

The environmental and social impact assessment concludes that:

There are no bio-physical impacts that are so highly negative that they would militate project development. However, as potential emission of fugitive dust, particulate matter, release of steam, odorous VOCs from the aqua feed production processing are expected, it is recommended to consider GMP and as discussed in Chapters 6 – 8 of this Report: mitigation measures for adverse impacts by regular plant maintenance and repair.

Also to consider environmental code of practice for good aqua feed production and monitoring plans to utilize appropriate equipment for emission / effluent treatment to capture these exhaust emissions to maintain the ambient air quality and to curb the potential for release of very odorous substances to the atmosphere; especially where anaerobic processes are employed. Odor control strategies should take into account of varying wind directions to minimise disturbance to adjacent residential or human environment

There are no potential resettlement issues as the project site is located in the Myaung Dagar Industrial Zone area and there is no inhabitants present in the premises of the project site as observed during site visits (May 2019 – Nov 2021);

Some benefits will accrue in both the construction and the operational phases for local employment and commercial opportunities;

Warehouses and components should meet international standards for structural design integrity and operational performance to avoid catastrophic failures during normal operation and during exposure to natural hazards to prevent fires and explosions;

Effective process safety management should reduce accidents and minimize adverse effects of accidents on human health, environment and properties;

By supporting the use of safe and nutritious fish feed in the Fishery Sector will provide the sustainable environment and improvement in the Myanmar food chain regarding aquaculture.

In the global scale, and compared with other (human, agricultural and industrial) activities, aquaculture does not have a very important impact in total release of nutrients into the environment. The impact of aquaculture is much localized to the vicinity of the farms. This small impact could be further reduced by optimizing feeds and feeding strategies. In the future, it is expected that the aquaculture industry in Myanmar will turn into a more efficient and more environmentally friendly extruded feeds with high energy / protein ratios, highly digestible raw materials and low phosphorous level. The production cost of fish and the nutrient and sediment loads into the environment per ton of fish produced will in fact decrease due to the high performance of this new generation of Aquafeeds.

This and a sound management of the aqua farms will lead to a sustainable development of Myanmar Aquaculture through the twenty-first century.

All the environmental and social impacts identified are capable of mitigation through a combination of adherence to National Environmental Conservation Law, 2012, Environmental Regulations, 2014, EIA Procedure Notification, 2015, Environmental Quality (Emission) Guidelines, 2015; and abiding to relevant local and international design codes and effective health and safety and environment (HSE) policy by the operators.

During the construction phase an environmental management plan will be an important component of the operator's HSE implementation. Regular inspection and audit will underpin the efficacy of the EMP.

The environmental risk of the project has been evaluated as low assuming that the facilities are properly designed and operated according to international industry norms for the sector. Risks of fire hazard, severe weather or natural disaster affecting the project are present (cyclones, floods, fire, etc.). However, these are assumed to be mitigated through sound engineering design of the facilities, professional construction technologies, supervision and monitoring of the project during its construction and operational phases. Effective process safety management should reduce accidents and minimize adverse effects of accidents on human's health, environment and properties.

# **APPENDICES**



## **APPENDIX – A**

## Appendix-A

ရန်ကုန်တိုင်းဒေသကြီး၊ မော်ဘီမြို့နယ်ရှိ မြောင်းတကာ စက်မှုဇုန်တွင် De Heus Myanmar Limited မှ Aqua Feed Mill Factory တည်ဆောက်ရန် စီမံကိန်းအတွက် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုရေးအကျိုးသက်ရောက်မှု ဆန်းစစ်ခြင်း ကိစ္စနှင့် ပတ်သက်၍ အကြံလုပ်ငန်းညှိနှိုင်း အစည်းအဝေးမှတ်တမ်း အကျဉ်းချုပ်

Date – 29.6.2019



ဇူလိုင် ၂၀၁၉

Organized by:



National Engineering & Planning Services Co., Ltd, Myanmar

For

De Heus Myanmar Limited

இ.இ. இ.ம. மா:

အကြိုလုပ်ငန်း ညှိနှိုင်း အစည်းအဝေးပွဲ တက်ရောက်သူများစာရင်း

**De Heus Myanmar အစည်းအဝေးခန်းမ၊ မြောင်းတကာ စက်မှုဇုန်**

**Date - 29.6.2019**

[illegible]

De Heus Myanmar Limited

အကြိုလုပ်ငန်း ညှိနှိုင်း အစည်းအဝေးပွဲ တက်ရောက်သူများစာရင်း

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**Date - 29.6.2019**

[illegible]



ဖြန့်ဝေမှု ဌာန ဆိုင်ရာများ

အကြိုလုပ်ငန်း ညှိနှိုင်း အစည်းအဝေးပွဲ တက်ရောက်သူများစာရင်း  
De Heus Myanmar အစည်းအဝေးခန်းမ၊ မြောင်းတကာ စက်မှုဇုန်

**Date - 29.6.2019**

[illegible]

ညွှတ်တော်ကိုယ်စားလှယ်များ

အကြိုလုပ်ငန်း ညှိနှိုင်း အစည်းအဝေးပွဲ တက်ရောက်သူများစာရင်း

**De Heus Myanmar အစည်းအဝေးခန်းမ၊ မြောင်းတကာ စက်မှုဇုန်**

**Date - 29.6.2019**

[illegible]



NEPS Co., Ltd

အကြိုလုပ်ငန်း ညှိနှိုင်း အစည်းအဝေးပွဲ တက်ရောက်သူများစာရင်း

**De Heus Myanmar အစည်းအဝေးခန်းမ၊ မြောင်းတကာ စက်မှုဇုန်**

**Date - 29.6.2019**

[illegible]

ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်ရှိ မြောင်းတကာစက်မှုဇုန်တွင် De Heus Myanmar Limited  
 မှ Aqua Feed Mill Factoruy တည်ဆောက်ရန် စီမံကိန်းအတွက် သဘာဝပတ်ဝန်းကျင်နှင့်  
 လူမှုရေးအကျိုးသက်ရောက်မှု ဆန်းစစ်ခြင်း ကိစ္စနှင့် ပတ်သက်၍ အကြံလုပ်ငန်း ညှိနှိုင်း  
 အစည်းအဝေးမှတ်တမ်း အကျဉ်းချုပ်

De Heus Myanmar Limited အစည်းအဝေးခန်းမ၊ မြောင်းတကာစက်မှုဇုန်၊ မှော်ဘီမြို့နယ်

၂၉.၆.၂၀၁၉

စဉ်	ဆွေးနွေးသူအမည်	အကြောင်းအရာ
၁။	ဦးအေးမြင့် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး အဖွဲ့ခေါင်းဆောင် (NEPS)	<p>-ကျွန်တော်တို့ ဒီနေ့ ကျင်းပတဲ့ အစည်းအဝေးကတော့ မြောင်းတကာ စက်မှုဇုန်မှာ De Heus Myanmar Limited ကုမ္ပဏီမှ Aqua Feed Mill Plant တည်ဆောက်မည့် စီမံကိန်းနှင့် ပတ်သက်၍ သဘာဝပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာ ပြုစုရန်အတွက် အကြံလုပ်ငန်း ညှိနှိုင်းအစည်းအဝေး ဖြစ်ပါတယ်။</p> <p>-သက်ဆိုင်ရာ ကုမ္ပဏီမှ ပဏာမ လုပ်ငန်း လုပ်ဆောင်မှုများကို ရှင်းလင်းသွားမှာ ဖြစ်ပါတယ်။ ကျွန်တော်တို့ ကုမ္ပဏီအနေနဲ့လည်း ကျွန်တော်တို့ရဲ့ လုပ်ဆောင်ချက်များကို ရှင်းလင်းသွားမှာ ဖြစ်ပါတယ်။</p> <p>-ဒီနေ့ အစည်းအဝေးကို နိုင်ငံပိုင် သတင်းစာများတွင် တရားဝင် ကြေညာပြီး လုပ်ဆောင်တာ ဖြစ်ပါတယ်။</p> <p>-တက်ရောက်လာကြသူများမှလည်း မရှင်းလင်းသည်များကို ပွင့်ပွင့်လင်းလင်း မေးမြန်းဆွေးနွေးကြစေ လိုပါတယ်။ ကျေးဇူးတင်ပါတယ်။</p>
၂။	Leo Zaw De Heus Myanmar Limited	<p>-ကြွရောက်လာကြသော လူကြီးမင်းများ အားလုံး မင်္ဂလာပါ။ ကျွန်တော်တို့ အနေနဲ့ စက်ရုံဆောက်မည့် အဆင့်ကနေ စက်ရုံလည်ပတ်သည်အထိ ပြင်ဆင်ထားသည်များကို ရှင်းပြမှာ ဖြစ်ပါတယ်။</p> <p>-ကျွန်တော်တို့ရဲ့ ထုတ်ကုန်များကို ၂၀၁၃ခုနှစ်က စတင်ပြီး ထုတ်လုပ်ခဲ့ပါတယ်။ ၂၀၁၆ခုနှစ်မှာ လက်ရှိ စက်ရုံကို တည်ဆောက်ပါတယ်။ ၂၀၁၆မှာ မန္တလေးမှာ စက်ရုံတစ်ခု ထပ်ဖွင့်ပါတယ်။</p> <p>-အနာဂတ်မှာလည်း စက်ရုံများ ထပ်မံ ဖွင့်သွားဖို့ ရှိပါတယ်။</p> <p>-ကျွန်တော်တို့ဟာ နယ်သာလန် အခြေစိုက် ဖြစ်တဲ့အတွက် စက်ရုံတည်ဆောက်တဲ့အခါ နယ်သာလန် ကုမ္ပဏီ၏ စည်းမျဉ်း စည်းကမ်းများအတိုင်း ဆောင်ရွက်ရမှာ ဖြစ်ပါတယ်။ Environmental နဲ့ပတ်သက်တဲ့ စည်းမျဉ်း စည်းကမ်းများလည်း ချမှတ်ထားပြီး ဖြစ်ပါတယ်။</p> <p>-လက်ရှိစက်ရုံအပြင် ငါးစာစက်ရုံ ထပ်မံတည်ဆောက်မှာ ဖြစ်ပါတယ်။ စက်ကို (၂)ဆိုင်းခွဲပြီး လည်ပါမယ်။ ဝန်ထမ်းအင်အား (၅၃)ယောက်နှင့် စတင်မှာ ဖြစ်ပါတယ်။</p>

		<p>-အစဦးမှာ တစ်လကို တန်(၅၀၀)ကနေ (၆၀၀)ကြား စတင်လည်ပတ်ပါမယ်။ နောက်ပိုင်းမှာ တန် (၁၅၀၀)အထိ ထုတ်လုပ်သွားမှာ ဖြစ်ပါတယ်။</p> <p>-Waste water treatment plant တည်ဆောက်ရန် အစီအစဉ်လည်း ရှိပါတယ်။ မိလ္လာစနစ်ကို အနည်ထိုင်တဲ့ စနစ်နဲ့ လုပ်ဆောင်မှာ ဖြစ်ပါတယ်။</p> <p>-သိလိုသည်များ မရှင်းလင်းသည်များကို ပွင့်ပွင်းလင်းလင်း မေးမြန်းလို့ရပါတယ်။ အားလုံးကို ကျေးဇူးတင်ပါတယ်။</p>
၃။	ဒေါ်ခင်သူဏမြင့် (Engineer, NEPS)	<p>-အားလုံးပဲ မင်္ဂလာပါ။ ကျွန်မ တင်ပြမှာကတော့ အဆိုပြု စီမံကိန်းအတွက် NEPS မှ ပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင် လေ့လာဆန်းစစ်ခြင်း လုပ်ငန်းမိတ်ဆက်ခြင်းနှင့် လုပ်ဆောင်ချက်များကို တင်ပြသွားမှာ ဖြစ်ပါတယ်။</p> <p>-လုပ်ဆောင်မှု လုပ်ငန်းအဆင့်ဆင့် အခြေခံ ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ ကောက်ယူခြင်း၊ စီမံကိန်း တည်နေရာနှင့် ရုပ်ပတ်ဝန်းကျင်၊ ဇီဝမျိုးစုံမျိုးကွဲ၊ လူမှုပတ်ဝန်းကျင်၊ သဘာဝ ပတ်ဝန်းကျင် စသည်တို့အပေါ် သက်ရောက်မှု၊ ထိခိုက်မှုများ ဆန်းစစ်ခြင်း၊ သုံးသပ်ချက်နှင့် အကြံပြုချက်များကို စသည်တို့ ဖြစ်ပါတယ်။</p> <p>-ယခု စီမံကိန်းအတွက် အစီရင်ခံစာကို ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်းအတိုင်း ဆောင်ရွက်သွားမှာ ဖြစ်ပါတယ်။</p> <p>-လေထု အရည်အသွေး၊ ရေအရည်အသွေး၊ အသံဆူညံမှု ဆန်းစစ်ခြင်းတို့ကို အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များအရ လေ့လာဆန်းစစ်မှာ ဖြစ်ပါတယ်။</p> <p>-စီမံကိန်းမှ ထွက်ရှိလာတဲ့ စွန့်ပစ်ရေ အရည်အသွေးကို ECD Guideline များအတိုင်း ဆန်းစစ်မှာ ဖြစ်ပါတယ်။</p> <p>-စီမံကိန်း ပတ်ဝန်းကျင်မှာ ရှိတဲ့ ကျေးရွာများဖြစ်တဲ့ ကုန်းကလေးနှင့် ကန်ကလေး ကျေးရွာများမှာ လူမှုစီးပွားစစ်တမ်း ကောက်ယူသွားမှာ ဖြစ်ပါတယ်။</p>
၄။	ဦးအောင်ဝင်း (ပြည့်သူ့လွှတ်တော် ကိုယ်စားလှယ်)	<p>-ကျွန်တော်တို့နိုင်ငံမှာ အဓိက အားအနည်းဆုံးက ရေနုတ်မြောင်းစနစ် ဖြစ်ပါတယ်။ ဒီတော့ ရေဆိုးထုတ်လွှတ်မှု စနစ်များကို ကောင်းမွန်အောင် လုပ်ကိုင်ရာမှာ အခက်အခဲ များစွာ ရှိပါတယ်။</p> <p>-ကျွန်တော်တို့ မှော်ဘီမှာ သဘာဝပတ်ဝန်းကျင်နဲ့ ပတ်သက်တဲ့ ပြဿနာများစွာ ရှိပါတယ်။</p> <p>-ဒီစက်ရုံရဲ့ သဘာဝသဘာဝအရ ကတော့ ပတ်ဝန်းကျင်ကို ထိခိုက်မှုများစွာ မရှိနိုင်ဘူးလို့ မြင်ပါတယ်။</p> <p>-စက်မှုဇုန်အတွင်းမှာ ကျူးကျော်ပြဿနာများလည်း ရှိနေပါတယ်။ ဇုန်ကော်မတီ စက်ရုံများမှ တာဝန်ရှိသူတွေက ပူးပေါင်းဖြေရှင်းသွားမှာ ဖြစ်ပါတယ်။</p>

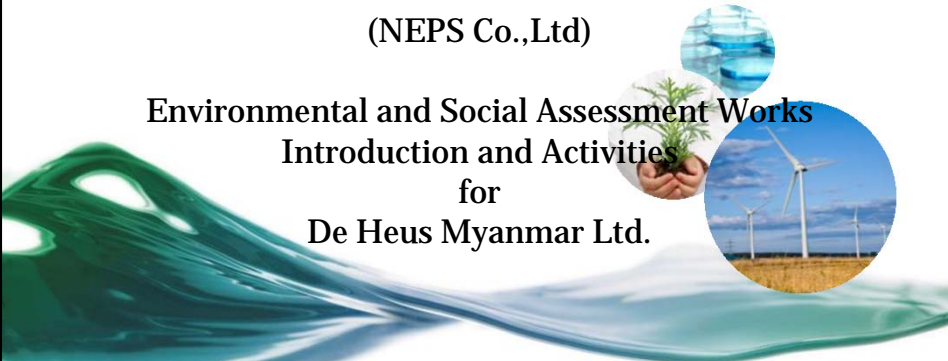
၅။	ဦးစိုးဝင်း (မှော်ဘီမြို့နယ် စည်ပင်သာယာရေး ကော်မတီ အမှုဆောင် အရာရှိ)	<p>-ကျွန်တော်က မြို့နယ်စည်ပင်မှာ အမှုဆောင် အရာရှိဖြစ်ပြီး၊ လက်ရှိ ဇန်နဝါရီလမှာလည်း အဖွဲ့ဝင် တစ်ဦး ဖြစ်ပါတယ်။</p> <p>-ကျွန်တော်တို့ ဒီဇေယာထဲမှာ ဇန်နဝါရီလအတွက် ရေဆိုးကန် တည်ဆောက်ဖို့ အစီအစဉ် ရှိပါတယ်။</p> <p>-ကျွန်တော်တို့ ကော်မတီအနေနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ ဆောင်ရွက်မှုများ လုပ်ဆောင်တဲ့အခါ ကျယ်ကျယ်ပြန့်ပြန့်နဲ့ သက်ဆိုင်ရာဌာနဆိုင်ရာများ၊ စက်ရုံများမှ ပူးပေါင်းပါဝင် ပေးစေလိုပါတယ်။ ကျေးဇူးတင်ပါတယ်။</p>
၆။	ဦးအေးမြင့် Environmental Team Leader, NEPS Co.,Ltd	<p>-ကျွန်တော်တို့ အစီရင်ခံစာများ ရေးသားတဲ့အခါ စောင့်ကြည့်လေ့လာရေး အစီအစဉ်များကိုလည်း ထည့်သွင်းရေးဆွဲ ရပါတယ်။</p> <p>-အချိန်မှန် စောင့်ကြည့်လေ့လာရေး အစီအစဉ်များကို ဆောင်ရွက်ရန် ရေးဆွဲ အကြံပြု ရေးသားရပါတယ်။</p>
၇။	ဦးမိုး မြို့မိ မြို့ဖ	<p>-ကျွန်တော်တို့ အနေနဲ့ အလုပ်အကိုင် အခွင့်အလမ်းများ ဖော်ဆောင်ပေးစေလိုပါတယ်။</p> <p>-ကျွန်တော်တို့ ဒေသခံများ ကျေးရွာများ ဖွံ့ဖြိုးတိုးတက်ရေး အတွက် အထောက်အပံ့ အကူအညီများ ဆောင်ရွက်ပေးစေလိုကြောင်း ပြောလိုပါတယ်။ ကျေးဇူးတင်ပါတယ်။</p>
၈။	ဦးအေးမြင့် Environmental Team Leader, NEPS Co.,Ltd	<p>-ကျွန်တော်တို့ Environmental လုပ်ငန်းများ ဆောင်ရွက်ရာမှာ CSR ဆိုတဲ့ လူမှုပတ်ဝန်းကျင်အတွက် ကောင်းမွန်သော အကူအညီ ပေးမှုများ ဆောင်ရွက်ရမှာ ဖြစ်ပါတယ်။</p> <p>-အများစု ပြောကြတာကတော့ အသားတင် အမြတ်ရဲ့ ၂%ကို ဒေသခံများအတွက် ထောက်ပံ့မှုများ ဆောင်ရွက်ပေးရမယ်လို့ ရှိပါတယ်။</p> <p>-လုပ်ငန်း အကြီးအသေး၊ အကျိုးအမြတ်အပေါ် မူတည်ပြီး ဒေသခံများအတွက် ဆောင်ရွက်ပေးရမှာ ဖြစ်ပါတယ်။</p>
၉။	Leo Zaw De Heus Myanmar Limited	<p>-ကျွန်တော်တို့ အနေနဲ့ကတော့ CSR Project Manager တစ်ယောက် ထားရှိထားပါတယ်။</p> <p>-အဓိက ကတော့ ဥရောပကလူတွေ အမြင်မှာ ပညာရေးနဲ့ ကျန်းမာရေးဆိုင်ရာများကို ဦးစားပေးပြီး ထောက်ပံ့ပေးမှာ ဖြစ်ပါတယ်။</p> <p>-လက်ရှိအချိန်မှာ ကျွန်တော်တို့ အနေနဲ့ မျက်မှန် လိုအပ်တဲ့ ဒေသခံများကို မျက်မှန်အလက် (၆၀) ထောက်ပံ့ ပေးထားပါတယ်။ မျက်စိခွဲပေးခြင်း၊ မျက်စိစစ်ပေးခြင်းများ ဆောင်ရွက်ပေးပါတယ်။</p>
၁၀။	ဦးမောင်ဇော် အုပ်ချုပ်ရေးမှူး (ကန်ကလေးကျေးရွာ)	<p>-ဒီစက်မှုဇုန်ဝင်းထဲမှာတော့ မီးရပါတယ်။ ကျွန်တော်တို့ ရွာတွေမှာ စက်မှုဇုန်နဲ့ ကပ်လျက်ရှိပေမယ့် မီးမရသေးပါဘူး။ နောက်တစ်ချက်က ကောင်းမွန်သော ရေမြောင်းစနစ်များ ဖော်ဆောင်စေလိုပါတယ်။</p>

၁၁။	Leo Zaw De Heus Myanmar Limited	<p>-ကျွန်တော်တို့ အနေနဲ့ကတော့ လစဉ်လတိုင်း သန့်ရှင်းရေး၊ စက်ရုံဝန်းကျင် ခြုံရှင်းခြင်း၊ ရေမြောင်းများ၊ လမ်းမီးများ ပြုပြင်ခြင်းများကို အစီအစဉ် ချမှတ်ပြီး လုပ်ဆောင်နေပါတယ်။</p> <p>-သို့ပါသော်လည်း စက်မှုဇုန်ဝင်းကြီး တစ်ခုလုံးအတွက်ကတော့ ကျွန်တော်တို့ စက်ရုံတစ်ခုတည်းတင် မကဘဲ ဇုန်ကော်မတီနှင့် အခြားစက်ရုံများမှ ပူးပေါင်းဆောင်ရွက်ရမှာ ဖြစ်ပါတယ်။</p>
၁၂။	ဦးကြည်လွင် မြို့မမြို့ဗ	<p>-ကျွန်တော်တို့ အနေနဲ့ ဆိုင်ကယ်များ အသုံးပြုပြီး သွားလာရာမှာ စက်ရုံရှေ့တွေမှာ အရှိန်ချ ကွန်ကရစ်များကြောင့် မတော်တဆများ မကြာခဏ ဖြစ်ပွားပါတယ်။ ကျေးဇူးပြုပြီး ဖြေရှင်းပေးစေ လိုပါတယ်။</p> <p>-နောက်တစ်ချက်က လမ်းက (၂)လမ်းသွားပဲ ဖြစ်တာကြောင့် ကွန်တိန်နာများ ရပ်ထားတဲ့အခါ လမ်းပိတ်ဆိုခြင်းများ ဖြစ်ပေါ်လျက် ရှိပါတယ်။</p>
၁၃။	Leo Zaw De Heus Myanmar Limited	<p>-ကျွန်တော်တို့အနေနဲ့ စက်ရုံကိုလာတဲ့ ကားကြီးများ ရပ်နားရန် ကားပါကင် လုပ်ပေးထားတာ ရှိပါတယ်။ သို့ပေမယ့် စည်းကမ်းလိုက်နာမှု အားနည်းခြင်း၊ ကြီးကြပ်မှု လိုအပ်ခြင်းများ ဖြစ်တတ်ပါတယ်။ အတတ်နိုင်ဆုံး ဆောင်ရွက်ပေးမှာ ဖြစ်ပါတယ်။</p> <p>-အရှိန်လျှော့ ကွန်ကရစ်များကိုလည်း ယခုလအတွင်း (၂)ကြိမ် ပြင်ပေးထားပါတယ်။ အဆင်ပြေမယ်လို့ မျှော်လင့်ပါတယ်။</p>
၁၄။	ဦးအောင်သူရ ဒုတိယ မြို့နယ် အုပ်ချုပ်ရေးမှူး (အထွေထွေ အုပ်ချုပ်ရေး ဦးစီးဌာန)	<p>-ကျွန်တော်တို့ အနေနဲ့ကတော့ ဒေသအတွင်းမှာ စက်ရုံတစ်ရုံ တိုးတာလာကို ကြိုဆိုပါတယ်။ အခုကတည်းက ကြိုတင်ပြီးတော့ အလုပ်ရှင် အလုပ်သမား ပြဿနာများ မဖြစ်ပေါ်စေရေး ဆောင်ရွက်စေလိုပါတယ်။</p>
၁၅။	Leo Zaw De Heus Myanmar Limited	<p>-အလုပ်ရှင်၊ အလုပ်သမား ပြဿနာနှင့် ပတ်သက်ပြီး အလုပ်သမား ဥပဒေများ၊ လုပ်ထုံးလုပ်နည်းများနှင့် အညီ အတတ်နိုင်ဆုံး လုပ်ဆောင်ပါတယ်။</p>
၁၆။	ဦးအေးမြင့် Environmental Team Leader	<p>-ဝိုင်းဝန်းဆွေးနွေးကြသူများကို အထူးပဲ ကျေးဇူးတင်ပါတယ်။ အစည်းအဝေး ပြုလုပ်ရခြင်းရဲ့ ရည်ရွယ်ချက်ကလည်း အချင်းချင်း မျက်နှာချင်းဆိုင် တွေ့ဆုံပြီး အခက်အခဲများ၊ ဖြစ်လိုသည်များ၊ ပြဿနာများကို ဖြေရှင်းနိုင်ရေး ဖြစ်ပါတယ်။</p> <p>-အဖက်ဖက်အတွက် မျှတတဲ့ အဖြေများ ရရှိအောင် ဝိုင်းဝန်းကြိုးစား ဆောင်ရွက်ရမှာ ဖြစ်ပါတယ်။ သို့မှသာ ဒေသအတွက်၊ နိုင်ငံအတွက် တိုးတက်မှုများ ဖြစ်ပေါ်လာမှာ ဖြစ်ပါတယ်။ အားလုံးကို ကျေးဇူးတင်ပါတယ်။</p>

## Presentation Attached

National Engineering and Planning Service Co.,Ltd.  
(NEPS Co.,Ltd)

Environmental and Social Assessment Works  
Introduction and Activities  
for  
De Heus Myanmar Ltd.



**NEPS**  
National Engineering & Planning Services

Date 29.6.2019

**စီမံကိန်းအကောင်အထည်ဖော်ဆောင်ရွက်ရန်အတွက် NEPS Co.,Ltd ၏ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင်ဆိုင်ရာ အကျိုးသက်ရောက်မှုဆိုင်ရာ ဆန်းစစ်ခြင်း လုပ်ငန်းအဆင့်ဆင့်**

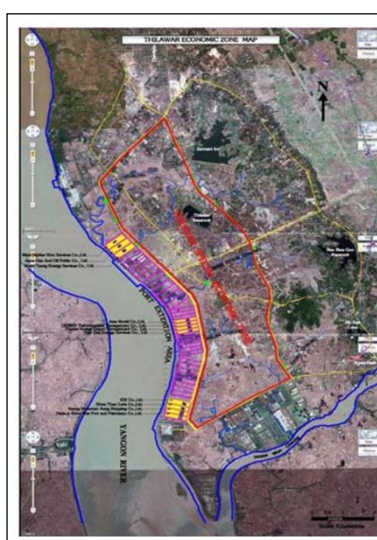
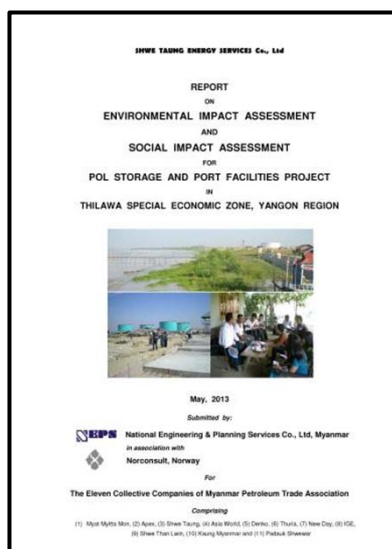
- ၁။ အခြေခံ ပတ်ဝန်းကျင်ဆိုင်ရာ အချက်အလက်များ ကောက်ယူခြင်း (Baseline Study)
  - (က) စီမံကိန်း တည်နေရာ
  - (ခ) ရုပ်ပတ်ဝန်းကျင် (Physical Study)
  - (ဂ) ဇီဝမျိုးစုံ၊ မျိုးကွဲ (Biodiversity)
  - (ဃ) လူမှုပတ်ဝန်းကျင် (Social Environment)
- ၂။ သဘာဝပတ်ဝန်းကျင်၊ လူမှုပတ်ဝန်းကျင်နှင့် ဇီဝပတ်ဝန်းကျင်ဆိုင်ရာ သက်ရောက်မှု/ ထိခိုက်မှုများ ဆန်းစစ်ခြင်း (Environmental and Social Impact Assessment)
- ၃။ သုံးသပ်ချက်နှင့် အကြံပြုချက်များ (Recommendations and Suggestions)
  - (က) ထိခိုက်မှုများနှင့် အကျိုးအပြစ်များအပေါ် လျော့ပါးသက်သာအောင် ဆောင်ရွက်ခြင်း (Impact and Mitigation Measures)
  - (ခ) စီမံကိန်းကာလနှင့် စီမံကိန်းပြီးကာလတွင် စောင့်ကြည့်လေ့လာ ဆန်းစစ်ခြင်း (Monitoring System)
  - (ဂ) ရှေ့လုပ်ငန်းစဉ်များ ဆောင်ရွက်ခြင်း (Environmental Management Plan)



NEPS Co.,Ltd မှ ဆောင်ရွက်ပြီးစီးခဲ့သည့် Wilmar Myanmar Port Terminals (Thilawa) Ltd ၏  
သီလဝါဆိပ်ကမ်းအတွက်အမှတ် ၂၂၊ ၂၃ နှင့် ၂၂-၂၃ကြားနေရာရှိ Wilmar Myanmar Port Terminals  
(Thilawa) Ltd မှတ်တမ်းများ



2013 ခုနှစ်၊ NEPS Co.,Ltd မှ ဆောင်ရွက်ပြီးစီးခဲ့သည့် Shwe Taung Energy Services Co., Ltd ၏  
Thilawa Special Economic Zoneအတွင်းရှိ 11 Company အတွက် ESIA ဆောင်ရွက်မှု မှတ်တမ်းများ





ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း(IEE) သို့မဟုတ် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း(EIA) ဆောင်ရွက်ရန်လိုအပ်သည့် စီမံကိန်းအမျိုးအစားနှင့် အရွယ်အစားသတ်မှတ်ချက်များ			
စဉ်	ရင်းနှီးမြှုပ်နှံမှုစီမံကိန်းအမျိုးအစား	ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း မြဲလုပ်ရန်လိုအပ်သည့် အရွယ်အစား	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း မြဲလုပ်ရန်လိုအပ်သည့်အရွယ်အစား
၄၇	တိရစ္ဆာန်အစားအစာထုတ်လုပ်ခြင်းလုပ်ငန်း	တစ်ရက်လျှင်ထုတ်ကုန်တန် ၁၀၀ နှင့် အထက်၊ တန် ၃၀၀ အောက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ်ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ အောက်)	တစ်ရက်လျှင် ထုတ်ကုန် တန် ၃၀၀ နှင့် အထက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ် ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ နှင့်အထက်)
၄၈	အသီးအရွက်မှ စားသုံးဆီ ထုတ်လုပ်ခြင်းလုပ်ငန်း	တစ်ရက်လျှင် ထုတ်ကုန် တန် ၁၀၀ နှင့်အထက်၊ တန် ၃၀၀ အောက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ်ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ အောက်)	တစ်ရက်လျှင်ထုတ်ကုန် တန် ၃၀၀ နှင့်အထက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ် ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ နှင့်အထက်)
၄၉	ကစီဓာတ်ပါသော အစားအစာနှင့် ထုတ်ကုန်များ ထုတ်လုပ်ခြင်းလုပ်ငန်း	တစ်ရက်လျှင် တန် ၁၀၀ နှင့်အထက်၊ တန် ၃၀၀ အောက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ်ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ အောက်)	တစ်ရက်လျှင် တန် ၃၀၀ နှင့်အထက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ် ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ နှင့်အထက်)
၅၀	နှံစားသုံးနှံကုန်ကြမ်းပျားထုတ်လုပ်ခြင်းလုပ်ငန်း (ဆန်နှင့် ဂျုံ၊ ပြောင်းဖူး၊ ကော်ဖီ၊ ကောက်မှု၊ ပဲမှုန့်၊ ငရုတ်သီးမှုန့်၊ သီးနှံအမှုန့်အမျိုးမျိုးထုတ်လုပ်ခြင်း လုပ်ငန်း)	တစ်ရက်လျှင် တန် ၁၀၀ နှင့်အထက်၊ တန် ၃၀၀ အောက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ်ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ အောက်)	တစ်ရက်လျှင် တန် ၃၀၀ နှင့်အထက် (တစ်နှစ်လျှင် အများဆုံး ရက်ပေါင်း ၉၀ လည်ပတ် ဆောင်ရွက်လျှင် တစ်ရက်လျှင် တန် ၆၀၀ နှင့်အထက်)
၅၁	အမျိုးမျိုးစက်ရုံ လည်ဆောက်ခြင်းလုပ်ငန်း	တစ်ရက်လျှင် တန် ၅၀ နှင့်အထက်၊ တန် ၁၀၀ အောက်	တစ်ရက်လျှင် တန် ၁၀၀ နှင့်အထက်

## အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သစ်တောရေးရာဝန်ကြီးဌာန



အမိန့်ကြော်ငြာစာအမှတ် (၆၀၅/၂၀၁၅)  
(၂၀၁၅ ခုနှစ်၊ ဒီဇင်ဘာလ ၂၉ ရက်)

အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု)  
လမ်းညွှန်ချက်များ

၂၀၁၅ ခုနှစ်၊ ဒီဇင်ဘာလ ၂၉ ရက်

## ကမ္ဘာကျန်းမာရေးအဖွဲ့မှ ချမှတ်ထားသော သောက်ရေ အရည်အသွေး၊ စံချိန် စံညွှန်း

Sr.No	Characteristics	Drinking water Standards World Health Organization (WHO)		Sample	Remark
		Highest Desirable	Maximum Permissible		
1	Phsico-chemical	Level	Level		
2	Turbidity (J.T.U)	5	25.0		Chemically potable
3	Colour (Pt-scale)	5	50.0		
4	Taste and odour	Nothing	Disagreeable		
5	pH	7-8.5	6.5-9.2		
6	Total solids	500	1500		
7	Total hardness	100	500		
8	Chloride	200	600		
9	Sulphide (as SO <sub>4</sub> )	200	400		
10	Fluoride (as F)	1	1.5		
11	Nitrates (as NO <sub>3</sub> )	45	45		
12	Calcium (as Ca)	75	200		
13	Magnesium	30	150		
14	Iron (as Fe)	0.1	1		
15	Manganese (as Mn)	0.05	0.5		
16	Copper	0.05	1		
16	Copper	0.05	1		
17	Zinc	5	15		
18	Phenic Compounds	0.001	0.002		
19	Detergents, anionic	0.2	1		
20	Mineral oil	0.01	0.30		
21	Arsenic	0.05	0.05		
22	Chromium (as Cr <sup>6+</sup> )	-	0.01		
23	Cyanide	-	0.05		
24	Lead	-	0.1		
25	Selenium	-	0.01		
26	Cadmium	-	0.01		
27	Mercury	-	0.001		
28	PCBS (µg/L)	-	0.2		
29	Gross alpha activity(Pci/L)	-	3		
30	Gross beta activity(Pci/L)	-	30		
31	EC(µmhos/cm)	-	250-750		

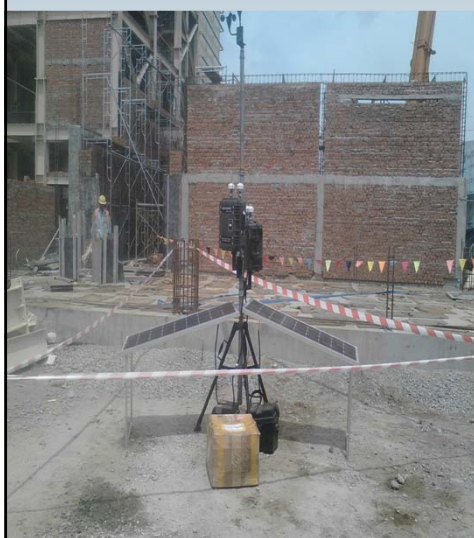
စွန့်ပစ်ရေ လမ်းညွှန်ချက်			
Sr. No.	Parameter	Unit	Guideline Value
1	5-days Biological Oxygen Demand	mg/l	50
2	Ammonia	mg/l	10
3	Arsenic	mg/l	0.1
4	Cadmium	mg/l	0.1
5	Chemical Oxygen Demand	mg/l	250
6	Chlorine (total residual)	mg/l	0.2
7	Chromium (hexavalent)	mg/l	0.1
8	Chromium (total)	mg/l	0.5
9	Copper	mg/l	0.5
10	Cyanide (free)	mg/l	0.1
11	Cyanide(total)	mg/l	1
12	Fluoride	mg/l	20
13	Heavy metal (total)	mg/l	10
14	Iron	mg/l	3.5
15	Lead	mg/l	0.1
16	Mercury	mg/l	0.01
17	Nickel	mg/l	0.5
18	Oil and grease	mg/l	10
19	pH	S.U. <sup>a</sup>	6-9
20	Phenols	mg/l	0.5
21	Selenium	mg/l	0.1
22	Silver	mg/l	0.5
23	Sulphide	mg/l	1
24	Temperature Increase	°C	<3°
25	Total coliform bacteria	100 ml	400
26	Total phosphorus	mg/l	2
27	Total suspended solids	mg/l	50
28	Zinc	mg/l	2

ဆူညံသံလမ်းညွှန် (Noise Level)		
Receptor	One Hour Laeq(dBA) <sup>a</sup>	
	Daytime 07:00- 22:00 (10:00-22:00 for Public Holidays)	Nighttime 22:00-07:00 (22:00-10:00 for Public Holidays)
Residential, Institutional, Educational	55	45
Industrial, Commercial	70	70

## ထုတ်လွှတ်အရိုးအငွေ့လမ်းညွှန်ချက်

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	1 year	40
	1 Hour	200
Ozone	8 Hour	100
Particulate matter PM 10	1 year	20
	24 hour	50
Particulate matter PM 2.5	1 year	10
	24 hour	25
Sulphur dioxide	24 hour	20
	10 minute	500

## HAZ- SCANNER







**De Heus Ltd., အတွက် သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင်ဆိုင်ရာ အကျိုးသက်ရောက်နိုင်မှုများ ဆန်းစစ်ခြင်း လုပ်ငန်းအဆင့်ဆင့် အကောင်အထည်ဖော်ဆောင်မည့် အချိန်ဇယား**

Item	Works	Scoping Phase					ESIA Working Phase												Remark
		1	2	3	4	5	1	2	3	4	5	6	7	8	9	10	11	12	
I	Environmental and Social Assessment																		
1	Desk Study and Data Collection																		
2	Initial Stakeholder Meeting																		
II	Scoping Report																		to be start survey after ECD approval
III	Baseline Data Collection																		
A.A	Bio-Physical Environment Survey																		
1.A	Physical Environment Survey																		
1.1	Land (Soil Survey, Land Use and Solid Waste)																		
A-1.2	Water (Surface/ underground Water Quality of Surface , (Waste), Climate and Hydrology)																		
A-1.3	Air (Air Quality, Noise)																		
A-2	Biological Environment Survey																		
A-2.1	Flora (Terrestrial and Aquatic )																		
A-2.2	Fauna (Terrestrial and Aquatic)																		
A-2.3	Ecosystem																		
B	Social Environment Survey																		
	- (Demography, Social Economy, Livelihood, Health, Education, Communication, Infrastructure, Public Facilities and Archeological and Cultural Property)																		
	- Traffic Data Collection																		
IV	Data Analysis and Impact Assessment																		
	- Biological Team																		
	- NEPS Team (Physical and Social)																		
V	Environmental Mitigation and Management Plan (EMP)																		
VI	Environmental Monitoring Plan (EMP)																		
VII	Final Stakeholder Meeting																		
VIII	Draft Report																		



**NEPS Co.,Ltdမှ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင်ဆိုင်ရာ  
အကျိုးသက်ရောက်နိုင်မှုများ ဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် ဆက်လက်ထည့်သွင်း  
ရေးသား ပြုစုမည့် ခေါင်းစဉ်များ အကျဉ်းချုပ်**

**TOR for the EIA Study**

**A. SCOPE OF WORKS**

**CONTENT**

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Executive Summary</li> <li>2. Introduction</li> <li>2.1 Objective of EIA and SIA Study</li> <li>3. Project Description</li> <li>3.1 Project Overview</li> <li>3.2 Project Location</li> <li>3.3 Methodology and Approach</li> <li>3.4 Policy, Legal and Institutional Framework</li> <li>4. Baseline Study of the Environment</li> <li>4.1 Physical Environment (Soil, Air and Water)</li> <li>4.2 Biological Environment (Flora and Fauna)</li> <li>4.3 Social Environment</li> </ol> | <ol style="list-style-type: none"> <li>5. Potential Environmental and Social Impacts from Anticipated Project</li> <li>5.1 Construction Phase</li> <li>5.1.1 Bio-Physical Impacts               <ul style="list-style-type: none"> <li><input type="checkbox"/> Storm water run-off</li> <li><input type="checkbox"/> Construction Impacts of noise, dust and increased traffic, etc.</li> <li><input type="checkbox"/> Solid waste handling</li> <li><input type="checkbox"/> Liquid waste handling including sanitation</li> <li><input type="checkbox"/> Changes in natural drainage patterns</li> <li><input type="checkbox"/> Impacts to Forest Cover</li> </ul> </li> <li>5.1. 2 Socio-Economic Impacts               <ul style="list-style-type: none"> <li><input type="checkbox"/> Impact on local service and livelihood</li> <li><input type="checkbox"/> Employment opportunities.</li> <li><input type="checkbox"/> Possible cultural impact</li> <li><input type="checkbox"/> Health and Safety routines for work force</li> </ul> </li> </ol> |
|--|--|

**NEPS Co.,Ltdမှ သဘာဝပတ်ဝန်းကျင်နှင့် လူမှုပတ်ဝန်းကျင်ဆိုင်ရာ  
အကျိုးသက်ရောက်နိုင်မှုများ ဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် ဆက်လက်ထည့်သွင်း  
ရေးသား ပြုစုမည့် ခေါင်းစဉ်များ အကျဉ်းချုပ်**

- 5.2 Operational Phase
- 5.2.1 Bio-Physical Impacts
  - ☐ Solid waste handling
  - ☐ Water Quality
  - ☐ Drainage patterns
- 5.2.2 Socio-Economic Impacts
  - ☐ Impact on local service and livelihood
  - ☐ Visual / aesthetic impact
6. Environmental Management Plan
- 6.1 Mitigation Measures and Monitoring Plan
7. Stakeholder Meeting and Public Consultation
8. Conclusion and Recommendation

**FIGURES, TABLES  
PHOTOS  
ANNEXES**





လူကြီးမင်းများအားလုံးကို  
ကျေးဇူးအထူးတင်ရှိပါသည်။

*Thanks for your Attention*



*De Heus Myanmar  
EIA public meeting*

*Name: Chan Myae Aung Soe (Chan)  
Date: 29th June 2019*



## *Agenda*

1. Mission, vision, company culture and 5 pillars
2. De Heus Global organization structure
3. Investment in Myanmar
4. Introduction to Factory : Location and Layout, Operational Infrastructure, Plant Capacity , Production Process
5. Production Plant Construction Project and Design related to Environmental Facts
6. Q & A



## Mission

Our mission is to secure the continuity of De Heus as a family-owned business and to realize worldwide growth in the animal feed industry, in accordance with our vision, values and culture and in doing so, creating agricultural development and progress wherever we are active.

ကျွန်ုပ်တို့၏ရပ်တည်ချက်မှာ De Heus ကုမ္ပဏီအားမိသားစုပိုင် ကုမ္ပဏီအဖြစ် အစဉ်အမြဲ ဆက်လက်ရပ်တည်စေပြီး ကျွန်ုပ်တို့ကုမ္ပဏီ၏ရပ်တည်ချက်၊ ရည်မှန်းချက်၊ တန်ဖိုးနှင့် အစဉ်အလာများနှင့် အညီ တိရစ္ဆာန်အစာထုတ်လုပ်ရေးလုပ်ငန်းအား ကမ္ဘာနှင့်အဝှမ်း လုပ်ကိုင်ရာတွင် ကျွန်ုပ်တို့လုပ်ငန်းလည်ပတ်ရာ နေရာဒေသ အသီးသီး၏ မွေးမြူရေးကဏ္ဍ ဖွံ့ဖြိုးတိုးတက်မှုတွင် အရှိန်အဟုန်ဖြင့် ပါဝင်ဆောင်ရွက်နိုင်ရမည် ဖြစ်သည်။

### Mission

## Vision

- ◆ With a growing world population and a growing standard of living, agricultural activity and food production will need to increase rapidly. It is our belief that an improved availability of cost price efficiently, sustainably produced food products is essential for the increase of prosperity worldwide.
- ◆ ကျွန်ုပ်တို့ ကမ္ဘာကြီး၏ တစ်နေ့တခြား များပြားလာသော လူဦးရေနှင့် ဖွံ့ဖြိုးတိုးတက်လာသော လူနေမှု အဆင့်အတန်းနှင့် အညီ စျေးနှုန်းသင့်တင့် မျှတ၍ ရေရှည်ရှိခို အားထားရနိုင်သော မွေးမြူရေးကဏ္ဍနှင့် စားသောက်ကုန် လုပ်ငန်းများသည်လည်း လျင်မြန်စွာ ဖွံ့ဖြိုးတိုးတက်လာရန် လိုအပ်ပေသည်။
- ◆ It is our vision to be a global leading supplier of nutritional products for animals in order to support the performance of our clients, the producers of meat, milk, eggs and fish. It is our objective to supply our clients with efficiency and technological progress by providing them with in-depth knowledge about animal nutrition and animal science.
- ◆ ကျွန်ုပ်တို့၏ ရည်မှန်းချက်မှာ အသား၊ ငါး၊ နို့နှင့် ဥ ထုတ်လုပ်သော မွေးမြူရေး သမားများ၏ လိုအပ်ချက်များကို ထောက်ပံ့ပေးခြင်း အားဖြင့် တိရစ္ဆာန် အာဟာရ ဆိုင်ရာ ထုတ်ကုန်များ ထုတ်လုပ်သူအဖြစ် ကမ္ဘာနှင့် အဝှမ်း ဦးဆောင်ရပ်တည် နိုင်ရမည် ဖြစ်သည်။ မွေးမြူရေးကဏ္ဍတွင် လုပ်ကိုင်သူများအား ကျွန်ုပ်တို့၏ တိရစ္ဆာန် မွေးမြူရေးနှင့် အာဟာရ ဆိုင်ရာ အသိပညာ ဗဟုသုတများ နည်းပညာ တိုးတက်မှု ဖြစ်စဉ်များနှင့် အချိန်တိုတို အတွင်း အကျိုးသက်ရောက်မှု များ ကို ကျယ်ပြန့်နှံ့နှံ့စွာ ထောက်ပံ့ဖြန့်ဖြူးပေးနိုင်ရမည် ဖြစ်သည်။

### Vision



## Our Company Behavioral Culture

- ◆ Winning: expressing desire to win and improve every day
- ◆ Helping: expressing the willingness to assist each other and work together
- ◆ Learning: expressing the will to increase spread of knowledge
- ◆ Communicating: expressing the will to be transparent and communicative



Company Culture

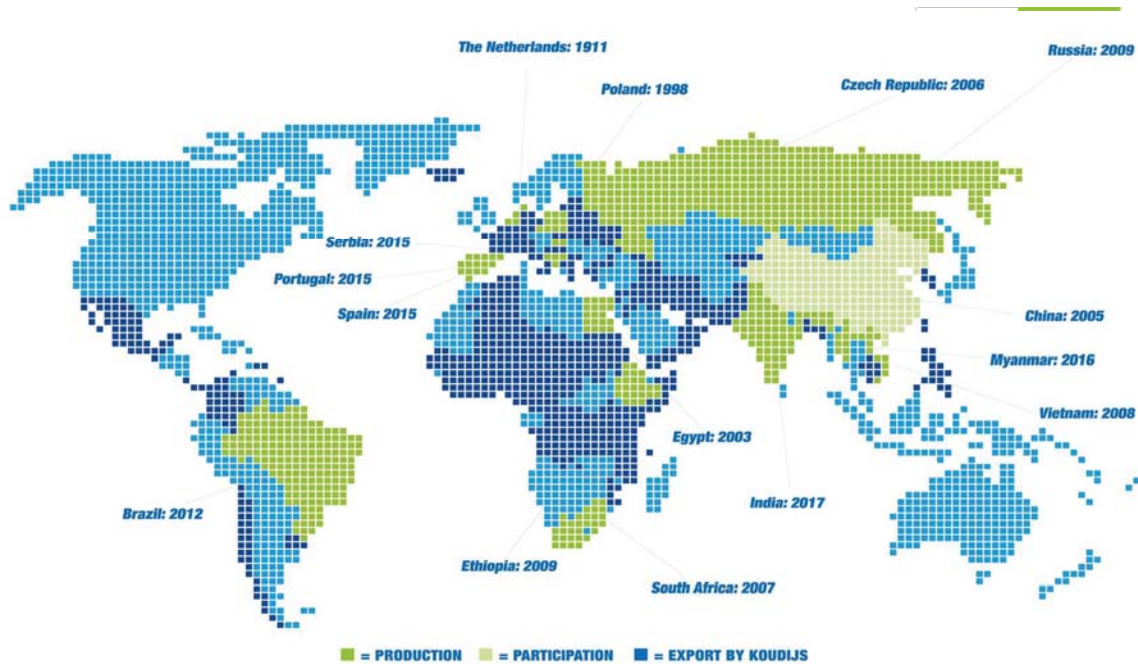
## 5 pillars that make De Heus unique!



<https://youtu.be/yrfbqqyMoIE>

5 pillars





De Heus Global organization structure



## Why De Heus in Myanmar?

- ◆ Exports to explore investment opportunities
- ◆ Good fit between the market and our strategy
- ◆ Myanmar market great potential
- ◆ First mover advantages
- ◆ Economic development = higher consumption of animal proteins

## De Heus Myanmar Ltd., Director Name List

ဒီဟဲစ်မြန်မာ ကုမ္ပဏီလီမိတက်၏ ဒါရိုက်တာအမည်စာရင်းများ

စဉ်	အမည်	ရာထူး
၁။	MR. KOENRAAD JACOB DE HEUS	Investor
၂။	Marcus Leonardus van der kwaak	CFO
၃။	John Christian Van Den Ban	Managing Director (De Heus Myanmar)

Organization

## Investment and Construction Project Data

ရင်းနှီးမြှုပ်နှံမှု နှင့် စီမံကိန်းဆိုင်ရာအချက်အလက်များ

စီမံကိန်းဆောင်ရွက်မည့်ကုမ္ပဏီ	ဒီဟဲစ်မြန်မာ ကုမ္ပဏီလီမိတက်
စီမံကိန်းတည်ဆောက်ရေးကာလ	၁၀ လ (ဇန်နဝါရီ ၂၀၁၉ မှ အောက်တိုဘာ ၂၀၁၉ ထိ)
တာဝန်ယူဆောင်ရွက်သည့်ကုမ္ပဏီ	- Antaco Myanmar
ရင်းနှီးမြှုပ်နှံမှုပုံစံ	- ၁၀၀% နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှုကုမ္ပဏီ
ရင်းနှီးမြှုပ်နှံမှုမတည်ရင်းနှီးငွေ	- အမေရိကန်ဒေါ်လာ ၁၄.၇၂၆ သန်း
စီမံကိန်းရည်ရွယ်ချက်	- ငါးစားအစာထုတ်လုပ်ခြင်းနှင့်ပြည်တွင်းမြန်မြန်ရောင်းချရန်။
စက်ရုံတည်နေရာ	- မြေကွက်အမှတ် -၃၀၉,၃၁၀,၃၁၁ ၊ မြောင်းတကာစက်မှုဇုန် ၊ မှော်ဘီမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။
စီမံကိန်းရင်းနှီးမြှုပ်နှံမှုကာလ	- နှစ် (၅၀) ၊ ၂၀၂၀ ခုနှစ် မှ ၂၀၇၀ ခုနှစ်ထိ။ မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင် (MIC) မှ ခွင့်ပြုမိန့်ကျသည့် ရက်စွဲ - ၆ ဖေဖော်ဝါရီ ၂၀၁၉

Investment

## Production Plant in MyangDaGar Industrial Zone



- ◆ Strategic location near important livestock areas and Hlaing river



- \* မြောက်လတ္တီတွဒ် - ၁၇ ဒီဂရီ ၉ မိနစ် ၂၄.၃၂ စက္ကန့်
- \* အရှေ့လောင်ဂျီကျု - ၉၅ ဒီဂရီ ၅၈ မိနစ် ၀၇.၀၇ စက္ကန့်

Introduction to Factory : Location and Layout, Operational Infrastructure,



## Production Plant in MyangDaGar Industrial Zone



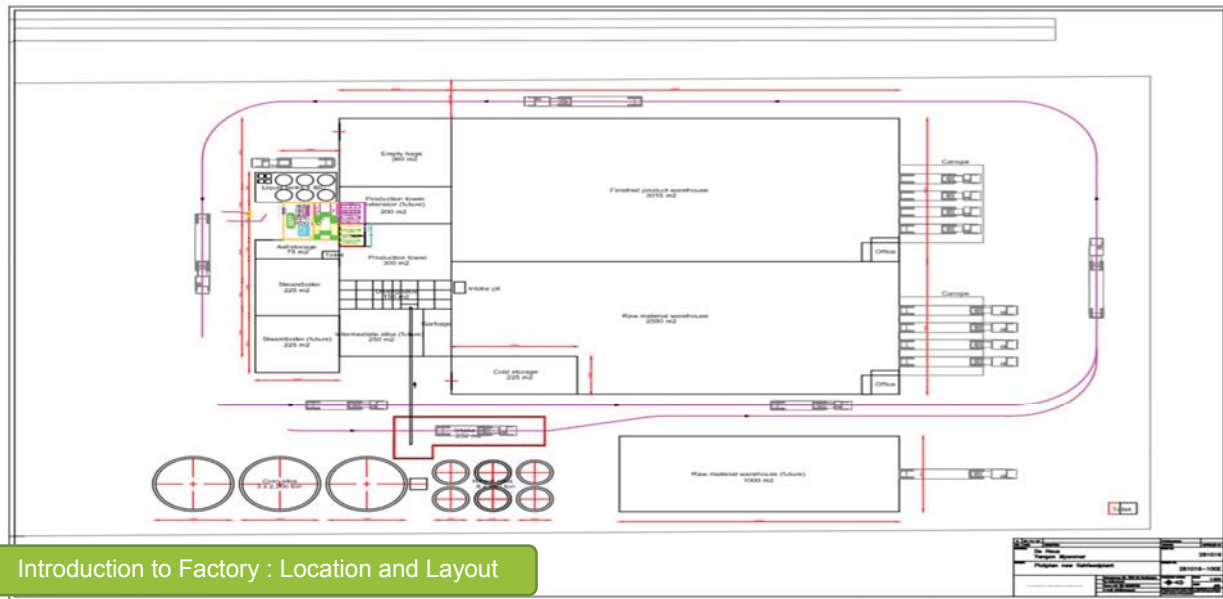
- ◆ Started construction (landfill) in January 2019



Factory

## Production Plant in MyangDaGar Industrial Zone

### Factory Layout



## Factory Construction Project:

International Building Design Code Concerned on Environmental Facts



### ❖ Building Area Breakdown

- Height of Production Tower – 43.5meters, 9 stories.
- Production Tower area- 650m<sup>2</sup>
- Finished Product Warehouse – 3015m<sup>2</sup>
- Raw Material Warehouse – 2787m<sup>2</sup>
- Utilities Rooms area (Transformer +Boiler + Empty bag room ) -910 m<sup>2</sup>
- Welfare block area- 724.5 m<sup>2</sup>
- Garbage Room ( Ash storage) – 75 m<sup>2</sup>
- Water Pump Room - 72 m<sup>2</sup>

## Operational Infrastructure လုပ်ငန်းလည်ပတ်ရန်အတွက် အခြေခံလိုအပ်ချက်များ



ရေသုံးစွဲမှုအခြေခံ	
ရေသုံးစွဲမှု (နှစ်စဉ်)	(၁၉၂,၇၂၀ ) ကုဗမီတာ
ရေအရင်းအမြစ်	အိမ်တွင်းရေ
ရေသိုလှောင်ထားမှု	(၅၅) ကုဗမီတာဆုံမြေအောက်ကန်တစ်ခု ၊ သန့်စင်ပြီးသောရေ (၁၁၀) ကုဗမီတာဆုံကန်တစ်ခု

လျှပ်စစ်သုံးစွဲမှု	
လျှပ်စစ်သုံးစွဲမှု (နှစ်စဉ်)	(၂၃,၉၂၉,၂၈၄) ကီလိုဝပ်အာဝါ
ရယူမည့်အရင်းအမြစ်	ရန်ကုန်မြို့တော်ပင်မလျှပ်စစ်ဓာတ်အားပေးရေးဌာန (၂,၅၀၀) ကေစီအေထရန်စဖော်မာတစ်လုံး

လောင်စာသုံးစွဲမှု (နှစ်စဉ်)	
ဒီဇယ်	(၁၀၈,၁၂၄) ဂါလံ (ပျမ်းမျှအသုံးပြုမှု)

အဓိကလိုအပ်ချက်များ	
အဓိကအသုံးပြုမည့်ကုန်ကြမ်းပစ္စည်းများ	ကောက်ပဲသီးနှံများ၊ ဖြည့်စွက် အစားအစာများ၊ ဆေးဝါးများ
စက်ရုံတွင်ခန့်ထားမည့်ဝန်ထမ်းအင်အား	(၅၃) ယောက်
စက်ယန္တရားများ	(၄၈) ချိုး

Factory

## Production Plant in MyangDaGar Industrial Zone



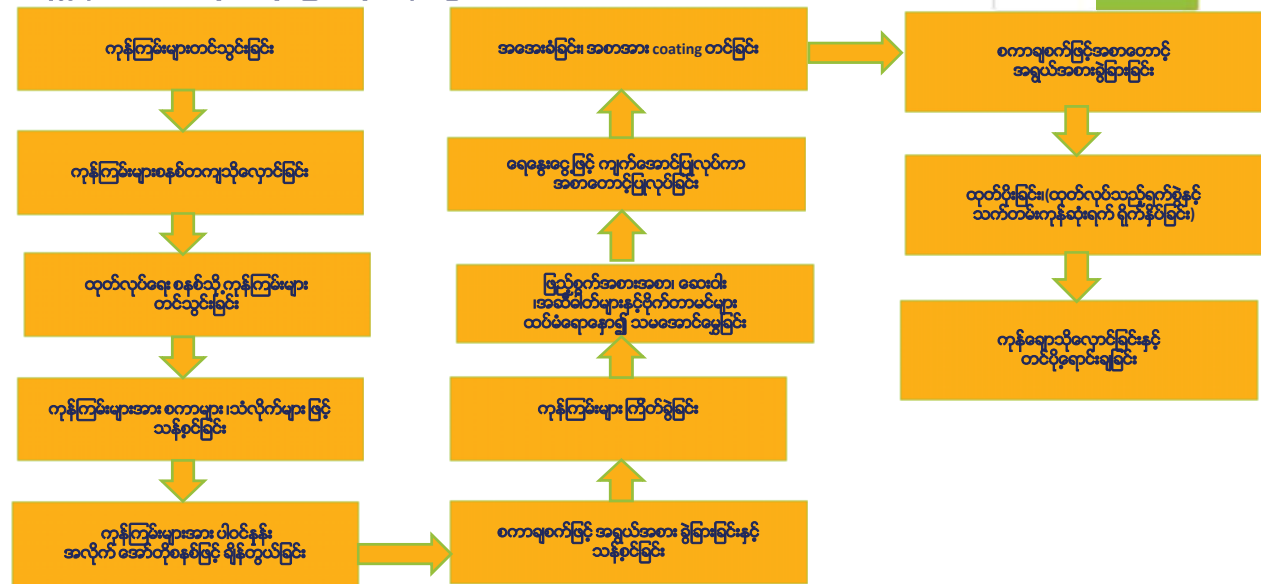
- ◆ Design capacity 220-18,000 MT/year
- ◆ Operation Phase 1 : 12-6,000 MT/month
- ◆ Operation Phase 2 : 30-16,000 MT/month

Factory Capacity



## Production Process Flow

တိရိစ္ဆာန်စားအစာ ထုတ်လုပ်ခြင်းလုပ်ငန်းစဉ်အဆင့်ဆင့်

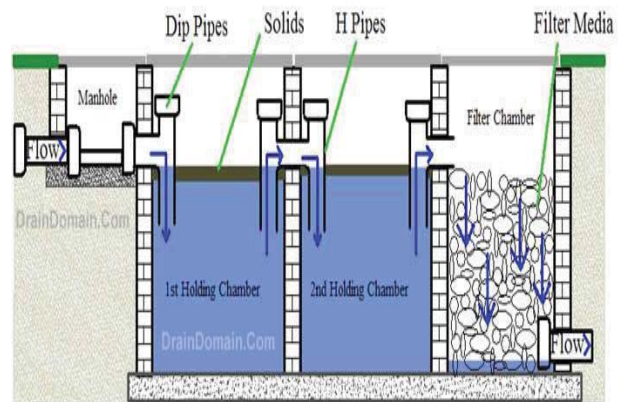
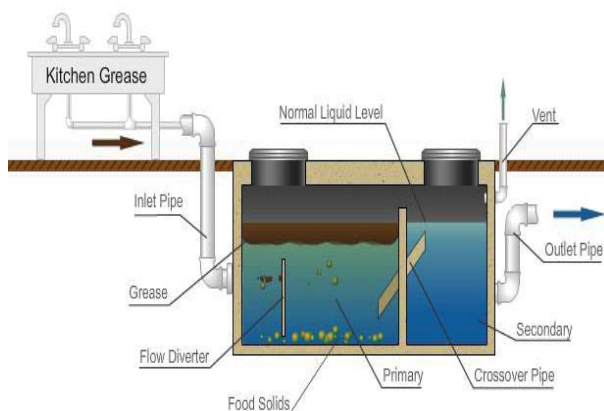


Factory process

## Factory Construction Project:

International Building Design Code Concerned on Environmental Facts

- ❖ Water usage designed - 50% treated water allocated on irrigation for 26% of green area (20 irrigation outlets)
- ❖ Cool down pit system for boiler released hot water
- ❖ Grease trap design for grease management system
- ❖ 3 steps ( 3 compartments) filtering design for sanitation and septic system



Factory Design



# Q&A



*Thank you for your attention!*

## **APPENDIX – B**

**Photo Records of Pre Meeting regard to Environmental Impact Assessment  
of Aqua Feed Mill Factory Project (29.6.2019)**



**Photo 1 : Registration and Introduction with the participants at the meeting**



**Photo 2 : Registration and Introduction with the participants at the meeting**



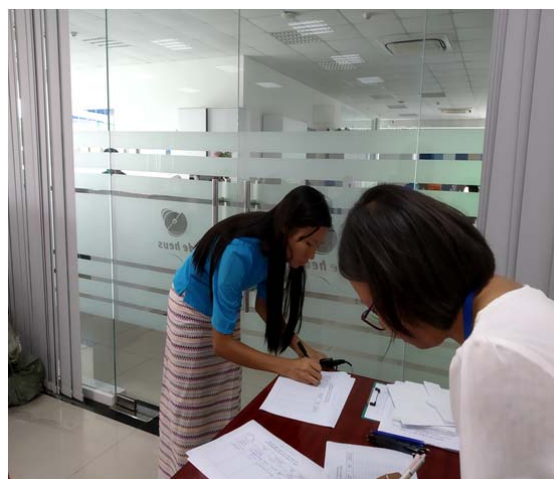
**Photo 3 : Registration and Introduction with the participants at the meeting**



**Photo 4 : Registration and Introduction with the participants at the meeting**



**Photo 5 : Registration and Introduction with the participants at the meeting**

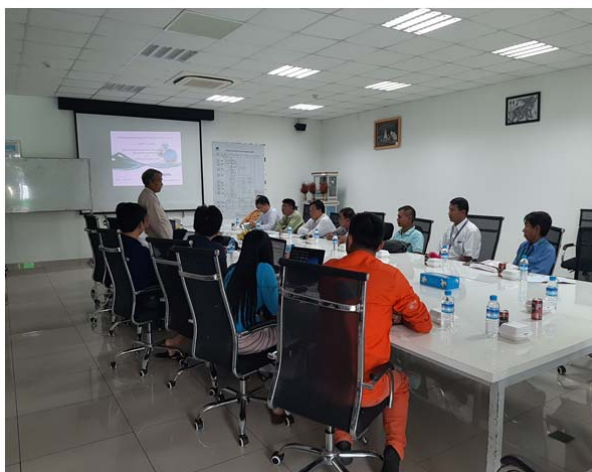


**Photo 6 : Registration and Introduction with the participants at the meeting**

### Photo Records of Pre Meeting regard to Environmental Impact Assessment of Aqua Feed Mill Factory Project (29.6.2019)



**Photo 7 : Registration and Introduction with the participants at the meeting**



**Photo 8 : Participants of pre meeting**



**Photo 9 : Participants of pre meeting**



**Photo 10 : Speech by U Aye Myint (Environmental Team Leader, NEPS Co.,Ltd)**



**Photo 11 : Presentation about proposed project by Representative of De Heus Myanmar Limited**



**Photo 12 : Presentation about NEPS by Daw Khin Thuzar Myint (Engineer, NEPS Co.,Ltd)**



### Photo Records of Pre Meeting regard to Environmental Impact Assessment of Aqua Feed Mill Factory Project (29.6.2019)



**Photo 13 : Discussion by U Maung Zaw (Village Administrator)**



**Photo 14 : Discussion by U Aye Myint (Environmental Team Leader, NEPS Co.,Ltd)**



**Photo 15 : Discussion by Parliament Member**



**Photo 16 : Discussion by U Kyi Lwin (Local People)**



**Photo 17 : Group Photo**



ဦးလှတွန်းမေတ္တာစိုပ်မွန်(ကင်ဆာ)ဖောင်အေးရှင်းသို့ အလှူငွေလှူဒါန်းခြင်း

[illegible]

အမြန်ဆက်သွယ်ပါရန်

၁၅-၆-၂၀၁၉ရက် ည ၁၀:၃၀နာရီခန့် တက္ကသိုလ်ရိပ်သာလမ်း နှင့်အင်းလျားမြိုင်လမ်းထိပ်အနီးတွင် ယာဉ်တိုက်မှုဖြင့် သေဆုံးသွားသော အသက်(၃၀)နှစ်ခန့် မြန်မာအမျိုးသား၏ မိသားစု/ဆွေမျိုးများမှ ယာဉ်မှုစစ်ရဲအရာရှိ ရဲအုပ်ရဲမင်းထွန်း-ဖုန်း-၀၉-၂၆၂၂၂၈၈၄၂ သို့ အမြန်ဆုံးဆက်သွယ်ပါရန်။

ယာဉ်မှစစ်  
ရဲအုပ်ရဲမင်းထွန်း  
ဗဟန်းမြို့မရဲစခန်း

အများသိစေရန်ကြေညာခြင်း

ရန်ကုန်မြို့၊ သစ်ပန်းကျွန်းမြို့နယ်၊ ကြီးပွားရေးဇုန်ကွက်၊ အမှတ်ရတာဝမ်း၊ အမှတ် ၁၃၂ ဦးခင်မောင်ချို  
 ၁၂/တမန(နိုင်)ဝေငှာပစ္စည်းဒေါ်ခန္ဓာထိုင် ၁၂/သဟက(နိုင်) ၁၆၆၁၄၀၇၈၊ ထွဲအပ်ညွှန်ကြားချက်များအရ  
 အောက်ပါအတိုင်း အမျိုးသမီးနေကြောင်းအဆိုသည်မှာ ကျွန်ုပ်၏မိတ်ဆွေဖြစ်သူဦးခင်မောင်ချိုနှင့်ဒေါ်ခန္ဓာထိုင်  
 တို့သည် ပုံစံခန့်မှန်းသော သစ်ပန်းကျွန်းမြို့နယ်တရားရုံး၏ ထွဲဖော်ဖြန့်ယူတရားသူကြီး(၁) ရှုအမှတ်၌ နှစ်ဦး  
 သဘောတူညီပြီးခြားအဆိုသာလင်ထုတ်ရေးထိုး၍ ယနေ့အချိန်တို့ အကြောင်းသမားအဖြစ် မိသားစုစိတ်ချမ်းမြေ့  
 ဆောင်ရွက်ရာ ဖေါင်းပေးနေထိုင်လျက်ရှိပါသည်။ ထို့ကြောင့် ဒေါ်ခန္ဓာထိုင်သာလင် ဦးခင်မောင်ချို၏ စာနစ်

ငြင်းချက်ထုတ်ရန်သမ္မန်စာ  
(တရားမကျင့်ထုံး ဥပဒေအမိန့်-၅၊ နည်းဥပဒေ-၂၀)  
မိတ္ထီလာမြို့နယ်တရားရုံး

[illegible]

ငြင်းချက်ထုတ်ရန်သမ္မန်စာ  
(တရားမကျင့်ထုံး ၃ပဒေအမိန့်-၅၊ နည်းဥပဒေ-၂၀)

**မိတ္ထီလာမြို့နယ်တရားရုံး**  
**၂၀၁၉ခုနှစ် တရားမကြီးမှုအမှတ်- ၆၄**

ဒေါ်အမာတင်	နှင့်	ဦးလှညွန့်၊
တရားလို		တရားပြိုင်

ဓနု ဘေးတိုင်းဒေသကြီး၊ မိတ္ထီလာမြို့၊ ပေါက်ချောင်းရပ်နေ ဦးလှညွန့်၊  
(ယခုခရုရပ်ဝပ်စာမဆိုသူ) သိစေရမည်။

သင်္ဂြိုဟ်အပေါ်၌ တရားလို ဒေါ်အမာတင်က ၎င်းခြေကွက်အရေးငင်းအဝတ်  
မှတ်တံတစ်စာချုပ် ချုပ်ဆိုပေးစေလိုမှုရလိုကြောင်းနှင့် လျှောက်ထား စွဲဆိုချက်  
ရှိသည်ဖြစ်၍ သင်ကိုယ်တိုင်ဖြစ်စေ၊ သို့တည်းမဟုတ် ၎င်းအမှုနှင့်ဆက်သွယ်၍  
အရေးကြီးသည့်စကားအရပ်ရပ်တို့ကို ရော့ပုံပြောဆိုနိုင်သူ သင်ကိုယ်စားလှယ်ရုံး  
အဖွဲ့အစည်းရှိ ရှေ့နေဖြစ်စေ၊ သို့တည်းမဟုတ် ၎င်းအမှုနှင့်ဆက်သွယ်သည့် အချက်  
များကို ရော့ပုံပြောဆိုနိုင်သူ တစ်ဦးတစ်ယောက် ၎င်းရှေ့နေနှင့်ပါဝင်၍ဖြစ်စေ  
၂၀၁၉ ခုနှစ် ဇူလိုင် ၃ ရက် (သို့မဟုတ် ၁၉ နှစ် ၁ ဖော်လှန် ၂ ရက်) မှစ၍တိုင်  
၁၀ နာရီတွင် အတက်ကအမည်ရေးသားပါရှိသူ တရားရုံး၏အဆိုအတိုင်း ထူးချွန်  
ရှင်းလင်းစွာဖြင့် ဤရုံးတော်သို့လာရောက်ရမည်။ ၎င်းအပြင် သင်သိစေရမည့်အခါ  
အတက်ကအဆိုခဲ့သည့်ရက်တွင် သင်အစောဆုံးရောက်ဖျက်ထုတ်ခဲ့လျှင် သင်မျက်စိက  
တွင် ငြင်းချက်များကို ထုတ်ပေးလိုမိမည်။ ၎င်းအပြင် တရားရုံးကကြည့်ရှုလိုသည့်  
စာချုပ်စာတမ်းများနှင့် သင်ကထူးချွန်ပြောဆိုပြီးလိုသည့် စာချုပ်စာတမ်း  
အဆိုရှိသည့်တို့ကို သင်နှင့်အတူ ယူဆောင်လာရမည်။ သို့တည်းမဟုတ် သင်ကိုယ်စား  
လှယ်အရာရှိတို့က သင်အဆိုပြုသည့်အခါ သင်ကထူးချွန်ပြောဆိုနိုင်မည်။ သင်ကထူးချွန်ပြောဆိုနိုင်မည်။

အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးဖွဲ့ ဖိတ်ကြားလွှာ

ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာ စက်မှုဇုန်တွင် De Heus Myanmar Limited မှ ငါးအစာ စက်ရုံတည်ဆောက်ခြင်းအတွက် သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုလေ့လာဆန်းစစ်ခြင်းလုပ်ငန်းအစီရင်ခံစာ Environmental Impact Assessment (EIA) ဗြဟ္မဇုန် (Third Party) ဖြစ်သော National Engineering & Planning Services (NEPS) ကုမ္ပဏီမှ ဌာနဆိုင်ရာများ၊ ဒေသခံမြို့သူများနှင့် လိုအပ်သည့်များကို အကြံပြုနိုင် တိုင်းဆွေးနွေးမှု ကျင်းပမည်ဖြစ်ပါ၍ စိတ်ပါဝင်စားသည့် မြေသူမူပိုင် ဆောက်လုပ်အခွင့်အစဉ်အတိုင်း တက်ရောက်နိုင်ပါကြောင်း အသိပေးကြေညာအပ်ပါသည်။

ရက်စွဲ - ၂၉.၆.၂၀၁၉ (စနေနေ့)  
အမျိုး - သ.၂၀၀ နာရီ  
နေရာ - မော်ဘီလီနယ်၊ မြောင်းတကာစက်မှုဇုန်၊ De Heus  
Myanmar Limited အစည်းအဝေးခန်းမ  
ဖုန်း - ၀၉-၇၉၄၉၀၂၀၊ ၀၁- ၈၆၆ ၂၄၀၇

အများသိစေရန်ကြေညာခြင်း

မန္တလေးမြို့ အောင်ခြေသာစံမြို့နယ်၊ ဥပသုတော်မိဘဈေးနေ  
ဒေါ်သီသီမာ ၉/မနမ(နိုင်)ဝဂ္ဂဟုဉာ (ဘ)ဦးချစ်စိန်သည် ၂၅-၄-  
၂၀၁၇ခုနှစ်တွင် BB/9687 (Nissan AD Van) အမျိုးအစားယာဉ်အား  
လက်ရှိဝယ်ယူပိုင်ဆိုင်ထားသူဖြစ်ကြောင်းနှင့် ကျွန်မပိုင်ဆိုင်သော  
ငှင်း BB/9687 (Nissan AD Van) အမျိုးအစားယာဉ်အား ကျွန်မ  
တစ်စုံတစ်ရာမသိရှိဘဲ ပေါင်နှံခြင်း၊ ရောင်းချခြင်း၊ ဝေးကမ်းခြင်း၊  
အခြားနည်းတစ်ခုခုဖြင့် ထွဲပြောင်းခြင်းများမပြုလုပ်ရန်နှင့် ပြုလုပ်ပါက  
တရားဥပဒေနှင့်အညီ ဆက်လက်တောင်းရွက်သွားမည်ဖြစ်ကြောင်း အများ  
သိစေရန် ကြေညာအပ်ပါသည်။

အောင်ခြေသာစံမြို့နယ်၊ ဥပသုတော်မိ  
မိဘဈေး

တန့်တွက်နိုင်ပါသည်

ရန်ကုန်မြို့၊ လမ်းမတော်မြို့နယ်၊ ၄-ရပ်ကွက်၊ မဟာဓမ္မလလင်း၊  
တိုက်အမှတ်(၁၂)၊ (၄)ခန်းတွင်(၁)ထပ်တိုက်၏ ပဉ္စမထပ်၊ ၆-လွှာ  
(ဝဲဘက်ခြမ်းအစွန်ဆုံးအခန်း)၊ အကျယ်(၁၂၅ ပေ x ၅၀ ပေ)ရှိ  
လူနေတိုက်ခန်း(၁)ခန်းနှင့်ယင်းတိုက်ခန်းရှိ လူနေတိုက်အသုံးပြုခွင့်အပါအဝင်  
အကျိုးခံစားခွင့်အရပ်ရပ်အားလုံးတို့ကို တရားဝင်ပိုင်ဆိုင်သည်ဟုဆိုသူ  
ခေါ်ဝေါ်ထား (အထူးစွဲမောင်ကို) (၁၂/လမတ (နိုင်) ၀၂၀၆၀၇)ထံမှ  
ကျွန်ုပ်၏စိတ်ဆွေက အပြီးအပိုင်ဝယ်ယူရန်(၁၆-၆-၂၀၁၉)နှစ်တွင်  
ရောင်းချခဲ့သော်လည်း တစ်ဝက်တစ်အောင်ကို ခရီးဆောင်မောင်မြို့မြို့ပယ်ပါသည့်  
ရောင်းချအောင်ကိုအပြီးတစ်ဆင့်အောင်ကို ဆက်လက်မောင်းချွန်ပြုပါသည်။  
တန့်ကွက်လုံသူများရှိပါက ပိုင်ဆိုင်မှုစာရွက်စာတမ်းများပူးပေါင်းပေးသော်လည်း  
ခိုင်လုံသောအထောက်အထားများဖြင့် ဤကြော်ငြာစာပါသည့်နေ့မှစ၍  
( ၁၄ )ရက်အတွင်း လူတိုက်ဝင်လာရောက်ကန်ကွက်နိုင်ကြောင်း



## Appendix B: Aqua Feed Photos Record










Generator



Fuel Storage Tank for Generator

Genset Photos

 <p>A photograph of an emergency light fixture mounted on a wall. The fixture has three horizontal light tubes that are illuminated with a bright blue light. To the right of the light fixture is a red fire alarm pull station. Above the light fixture is a small green indicator light.</p>	 <p>A photograph of an outdoor area, likely a parking lot or a paved area, with a blue fence in the background. A green sign with a white symbol is visible near the fence. The sign is mounted on a blue post. The background shows some trees and a clear blue sky.</p>
<p>Emergency Light &amp; Sign</p>	<p>Emergency place for labour</p>
<p>Emergency Sign</p>	

	
<p>Clinic</p>	<p>Ventilation system</p>
	
<p>Heat Resistant Wall</p>	<p>Dining Room</p>
	
<p>Drinking Water</p>	<p>Toilet</p>
<p>Facilities for Staff Photos</p>	





Grain Silo Area



Boiler Area



Boiler Area



Rice Husk Pellet (Fuel)



Raw Material



Intaking Process system

Machine, Storage, Workshop Photos



Intaking System



Intaking System



Raw Materials Storage Warehouse



Raw Materials Storage Warehouse



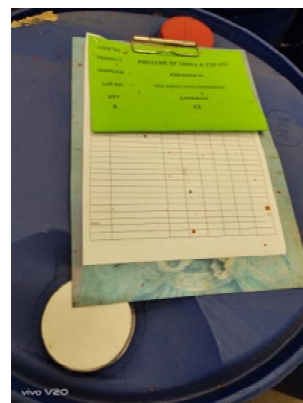
Raw Materials Storage Warehouse



Raw Materials



Raw Materials



Raw Materials



Packing Area

Packing Area





Bag Preparing for Finish Product



Grinding area

Blowing System



Blowing System

Blowing System



Coater



Mixer



Sifter



Sifter



Grinder



Dryer



Coater



Conveyor Line



Conditioner



Dryer



WH area



Dryer





Intermediate Storage Tank



Cooler



Intermediate Storage Tank



Metal detector



Weight Scale



Operating Feed



Steam Ole



Insulator



Extruder



Extruder



Storage tank



Operating Feed



Oil Storage Tank



Boiler



Sinking Feed



Floating Feed





**Fire Safety Equipment Photos**







AQUA FEED PROCESSING MACHINERY AND EQUIPMENT, STORAGE PHOTOS



AQUA FEED PROCESSING MACHINERY AND EQUIPMENT, STORAGE PHOTOS











AQUA FEED PROCESSING MACHINERY AND EQUIPMENT, STORAGE PHOTOS







AQUA FEED PROCESSING MACHINERY AND EQUIPMENT, STORAGE PHOTOS













Intake Bag Filter Machine



Boiler Bag Filter Machine





Hammer Bag Filter Machine



Pulverizer Bag Filter Machine



All spot Filter Machine



## **APPENDIX – C**



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်  
မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်  
ခွင့်ပြုမိန့်

ခွင့်ပြုမိန့်အမှတ် ၁၃၇ / ၂၀၁၉

၂၀၁၉ ခုနှစ် ဖေဖော်ဝါရီလ ၆ ရက်

မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင်သည် မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှု ဥပဒေပုဒ်မ- ၂၅ (ဂ) အရ ဤခွင့်ပြုမိန့်ကို ထုတ်ပေးလိုက်သည်-

- (၁) ရင်းနှီးမြှုပ်နှံသူအမည် MR. KOENRAAD JACOB DE HEUS
- (၂) နိုင်ငံသား DUTCH
- (၃) နေရပ်လိပ်စာ FERDINAND HUYCKLAAN 9, 3743 AK BAARN, THE NETHERLANDS
- (၄) ပင်မအဖွဲ့အစည်းအမည်နှင့်လိပ်စာ DE HEUS MYANMAR B.V, RUBENSSTRAAT 175, 6717 VE, EDE, THE NETHERLANDS
- (၅) ဖွဲ့စည်းရာအရပ် THE NETHERLANDS
- (၆) ရင်းနှီးမြှုပ်နှံသည့်လုပ်ငန်းအမျိုးအစား PRODUCTION AND DISTRIBUTION OF AQUA FEED PRODUCTS
- (၇) ရင်းနှီးမြှုပ်နှံသည့်အရပ်ဒေသ(များ) မြေကွက်အမှတ်- ၃၀၉၊ ၃၁၀၊ ၃၁၁၊ မြောင်းတကာသံမဏိစက်မှုဇုန်၊ မော်ဘီမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး
- (၈) နိုင်ငံခြားမတည်ငွေရင်းပမာဏ အမေရိကန်ဒေါ်လာ ၁၄.၇၂၆ သန်း
- (၉) နိုင်ငံခြားမတည်ငွေရင်းယူဆောင်လာရမည့်ကာလ ကော်မရှင်ခွင့်ပြုမိန့်ရရှိသည့်နေ့မှ ၂ နှစ် အတွင်း
- (၁၀) စုစုပေါင်းမတည်ငွေရင်းပမာဏ(ကျပ်) အမေရိကန်ဒေါ်လာ ၁၄.၇၂၆ သန်းနှင့် ညီမျှသော မြန်မာကျပ်ငွေ
- (၁၁) တည်ဆောက်မှုကာလ/ ပြင်ဆင်မှုကာလ ၁၈ လ
- (၁၂) ရင်းနှီးမြှုပ်နှံမှုခွင့်ပြုသည့် သက်တမ်း ၅၀ နှစ်
- (၁၃) ရင်းနှီးမြှုပ်နှံမှုပုံစံ ရာခိုင်နှုန်းပြည့်နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှု
- (၁၄) မြန်မာနိုင်ငံတွင် ဖွဲ့စည်းမည့် ကုမ္ပဏီအမည် DE HEUS MYANMAR LIMITED

*Thawng Tun*

(သောင်းထွန်း)

ဥက္ကဋ္ဌ





ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ

စက်မှုဝန်ကြီးဌာန

စက်မှုကြီးကြပ်ရေးနှင့်စစ်ဆေးရေးဦးစီးဌာန

ပုဂ္ဂလိကစက်မှုလုပ်ငန်းမှတ်ပုံတင်လက်မှတ်

စက်မှုမှတ်ပုံတင်အမှတ် \_\_\_\_\_ ရက်/ကြီး/၂၀၀၈ \_\_\_\_\_ ရက်စွဲ ၃၀ . ၇ . ၂၀၁၈

လုပ်ငန်းအရွယ်အစား အကြီးစား ပြည်ထောင်စုနယ်မြေ/တိုင်းဒေသကြီး/ပြည်နယ် \_\_\_\_\_ ရန်ကုန်

အောက်ပါလုပ်ငန်းသည် ပုဂ္ဂလိကစက်မှုလုပ်ငန်း ဥပဒေ ပုဒ်မ ၇ ပုဒ်မခွဲ ( ဂ )အရ မှတ်ပုံတင်ပြီး ဖြစ်ပါသည်။

၁။ လုပ်ငန်းအမည် De Heus Myanmar Limited တိရစ္ဆာန်အစားအစာထုတ်လုပ်ခြင်းလုပ်ငန်း

၂။ လုပ်ငန်းအမျိုးအမည် စားသောက်ရေးဆိုင်ရာလုပ်ငန်း

၃။ အဓိကကုန်ချောပစ္စည်းအမျိုးအမည် တိရစ္ဆာန်အစာမျိုးစုံ

၄။ တည်နေရာလိပ်စာ အမှတ်(၃၀၆၊ ၃၀၇၊ ၃၀၈) မြောင်းတကာစက်မှုဇုန်၊ မော်ဘီမြို့နယ်၊ မြောက်ပိုင်းခရိုင်

၅။ ပိုင်ဆိုင်မှုအမျိုးအစား ကုမ္ပဏီပိုင်

၆။ လုပ်ငန်းရှင်အမည် Mr.Jacobus Johannes De Heus (M.D)

၇။ ကိုင်ဆောင်သည့်မှတ်ပုံတင်အမှတ် PP No.BJKRBKB 29

၈။ ရင်းနှီးမြှုပ်နှံမှုတန်ဖိုး(ကျပ်) ၇၈. ၉၀ သန်း+US\$ ၃. ၇၂၆သန်း တည်ထောင်သည့်ခုနှစ် ၂၀၁၈

၉။ အသုံးပြုသည့်အားအမျိုးအစား ထရန်စဖော်မာ/လျှပ်ထုတ်စက် မြင်းကောင်ရေ ၂၀၀၀ KVA/

၁၀။ အလုပ်သမားဦးရေ ၁၀၈ ဦး ၁၂၅၀ KVA

၁၁။ မှတ်ပုံတင်သက်တမ်းကုန်ဆုံးသည့်နေ့ရက် ၃၁. ၇. ၂၀၁၉



အေးအေးဝင်း  
ညွှန်ကြားရေးမှူးချုပ်



လုပ်ငန်းရှင်များလိုက်နာရန်စည်းကမ်းချက်များ

- ၁။ ဤမှတ်ပုံတင်လက်မှတ်ကို အများမြင်သာသည့်နေရာတွင် ချိတ်ဆွဲထားရမည်။
- ၂။ ဤမှတ်ပုံတင်လက်မှတ်ကို မသက်ဆိုင်သူအား လွှဲအပ်ခြင်း သို့မဟုတ် လွှဲပြောင်းပေးခြင်းမပြုရ။
- ၃။ ဤမှတ်ပုံတင်လက်မှတ်ပါ အချက်အလက်များကို ပြင်ဆင်ခြင်း သို့မဟုတ် ဖြည့်စွက်ခြင်းမပြုရ။
- ၄။ ဤမှတ်ပုံတင်လက်မှတ် ပျောက်ဆုံးလျှင် မှတ်ပုံတင်လက်မှတ်မိတ္တူကို ထုတ်ပေးရန် ပြည်ထောင်စုနယ်မြေ သို့မဟုတ် တိုင်းဒေသကြီး သို့မဟုတ် ပြည်နယ်ဦးစီးဌာနမှူးထံ ခိုင်လုံသော အထောက်အထားနှင့်အတူ လျှောက်ထားရမည်။
- ၅။ မှတ်ပုံတင်လက်မှတ်ပျက်စီးလျှင် သို့မဟုတ် မထင်မရှားဖြစ်လျှင် သို့မဟုတ် မှတ်ပုံတင်လက်မှတ် ပါ အချက်အလက်များ ပြောင်းလဲရန်လိုအပ်လျှင် ပြည်ထောင်စုနယ်မြေ သို့မဟုတ် တိုင်းဒေသကြီး သို့မဟုတ် ပြည်နယ်ဦးစီးဌာနမှူးထံ မှတ်ပုံတင်လက်မှတ်နှင့် ပူးတွဲတင်ပြလျှောက်ထားရမည်။
- ၆။ ဤမှတ်ပုံတင်လက်မှတ်ကို စက်မှုလုပ်ငန်းနှင့်စပ်လျဉ်းသည့်ကိစ္စမှအပ မည်သည့်ကိစ္စတွင်မျှ အသုံးမပြုရ။
- ၇။ မှတ်ပုံတင်သက်တမ်းမကုန်ဆုံးမီ သက်တမ်းတိုးမြှင့်ပေးရန် လျှောက်ထားရာတွင် ဤမှတ်ပုံတင် လက်မှတ်ကို ပူးတွဲတင်ပြရမည်။
- ၈။ သက်တမ်းကုန်ဆုံးပြီး ရက်ပေါင်း (၆၀)အတွင်း သက်တမ်းတိုးမြှင့်လျှောက်ထားပါက သတ်မှတ်သည့် ဒဏ်ကြေးကို ပေးဆောင်ရမည်။
- ၉။ သက်တမ်းတိုးမြှင့်ရန် လျှောက်ထားခြင်းမရှိပါက မှတ်ပုံတင်ပျက်ပြယ်ပြီးဖြစ်သည်။

မှတ်ပုံတင်သက်တမ်းတိုးမြှင့်ခြင်း

[illegible]

# APPENDIX C1

## Proposed Personal Protective Equipment for Aqua plant

No	Location	Attention to:	Hazards	Eye protection		Body protection				Foot protection			Hand Protection					Respiratory protection		Head Protection			Fall Prevention	Ear Protection		Remark
				Safety glass	Face shield	Lab-Coat	Reflective	Apron	Site Attire	Lab-shoe	Slipper	Safety Shoe	Cotton Hand glove	Chemical Resistance	Plastic	Anti-cut	Heat Resistance	Mask N-95 dust mask	Cartridge Respirator, P3	Bump cap	Hard helmet	Hair Cap	Body harness for WAH	Ear Plug	Ear Muff	
1	Warehouse Raw, FG area	Staff Forklift Op;	Hit by forklift hazards						ok			ok									ok					
									ok			ok														
2	Boiler Area	Operator	Hot surface, steam, carbon dust, Slippery hazards						ok			ok					ok	ok		ok						
3	Liquid tank area	All							ok			ok														
4	Production Tower	All	dust, trip hazards, hit to column and conveyor						ok			ok	ok					ok		ok				ok		Ear plug for extruder area
6	Hand add area	Mixer	Chemical dust						ok			ok														
7	Premix Room area	Mixer	Chemical dust	ok	ok				ok			ok	ok						ok	ok						
8	Workshop	All	Fumes, sparks, molten Dust, sharp edge						ok			ok														
11	Intake area	Staff	Dust						ok			ok						ok		ok						
12	Silo Area	All	Dust						ok			ok														
13	Laboratory	All	Chemical spill, slippery hazards hygiene, hot oil, slippery hazards	ok		ok							ok	ok				ok								
14	Canteen (Kitchen)	All				ok							ok	ok				ok								ok
15	Security	All					ok		ok			ok							ok							



# Appendix C2

သဘောတူစာချုပ် ၂၀၂၀ ခုနှစ်၊ မတ်လ၊ (၁၂) ရက်

De Heus Myanmar Lease Agreement

17-3-2020

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Lease Agreement

(မြေငှားရမ်းခြင်းသဘောတူစာချုပ်)

၁၂ ၁၇၄၀ ၃၄၃၁၅

For land lease of Plots Nos. 309, 310 and 311 of Myaung Dakar Industrial Zone, Mingaladon Township, Myaung Dakar, Yangon  
 ရန်ကုန်တိုင်းဒေသကြီး၊ မြောင်းတကာ၊ မင်္ဂလာဒုံ မြို့နယ်၊  
 မြောင်းတကာစက်မှုဇုန် ၊ မြေကွက်အမှတ် ၃၀၉ ၊ ၃၁၀ နှင့် ၃၁၁  
 ကိုငှားရမ်းချိန်အတွက်

၈၈၂၂၀ + ၂၃၀၀၀

Parties

စာချုပ်ဝင်များ

U Aung Shwe Tun

စာချုပ်ဝင်များကို တရားဝင် နှုတ်ပေးခြင်း၊ ၁၃/၃/၂၀၂၀၊ ၁၃/၄/၂၀၂၀၊ ၁၃/၅/၂၀၂၀  
 တွင်ပြုလုပ်ပါသည်။

U Ye Aung

စာချုပ်တစ်ရပ်ပတ်ပတ်တော်အရ  
 ပြုစုထားသော စာချုပ်တစ်ရပ်ပတ်ပတ်တော်  
 ရှိပြီး နှစ်ရပ်ပတ်ပတ်တော်

De Heus Myanmar Ltd.

Dated 12 March 2020

ရက်စွဲ ၂၀၂၀ ခုနှစ်၊ မတ်လ (၁၂) ရက်





သဘောတူစာချုပ် ၂၀၂၀ ခုနှစ်၊ မတ်လ၊ ၇ ရက်နေ့ရက်  
 2020 Myanmar Lease Agreement

4.2 In consideration of the grant of the Lease, the Tenant will pay to the Confirming Party (as agent for the Landlord) a total Rent for the Leased Land for the entire Lease Period (including the Initial Lease Period, the First Extended Lease Period and the Second Extended Lease Period) of USD 624,344. The Tenant will pay the Rent to the Confirming Party in accordance with clauses 4.3 to Error! Reference source not found..

၄-၂ မြေငှားရမ်းခွင့်ပြုခြင်းအတွက် မြေငှားသည် (မြေရှင်၏ကိုယ်စားလှယ်အဖြစ် အောင်ရွက်သူ) အတည်ပြု ပေးသူစာချုပ်ဝင်အား ငှားရမ်းထားသောမြေအား ငှားရမ်းသည့် သက်တမ်းတစ်ခုလုံးအတွက် (ကနဦး စာချုပ်သက်တမ်းကာလ၊ မြေငှားရမ်းခြင်း သဘောတူစာချုပ် ပထမအကြိမ်သက်တမ်း တိုင်ခြင်းနှင့် မြေ ငှားရမ်းခြင်း သဘောတူစာချုပ်တတိယအကြိမ်သက်တမ်းတိုင်ခြင်းအထိ) အတွက်ငှားရမ်းခစုစုပေါင်း အမေ သိန်းပေါ်လာ ၆၂၄၃၄၄ ပေးဆွဲရမည်။ မြေငှားက မြေငှားရမ်းခကို အတည်ပြုစာချုပ်ဝင်အား အပိုဒ် ၄.၃ မှ ၄.၆ အထိ နှင့်အညီ ပေးဆွဲရမည်။

4.3 The Rent will be paid by the Tenant to the Confirming Party by instalments in accordance with the following schedule.

၄-၃ မြေငှားက မြေငှားရမ်းခကို အတည်ပြုပေးသူစာချုပ်ဝင်အား အောက်ဖော်ပြပါဇယားနှင့် အညီ အရပ်ကျ ပေးဆွဲရမည်။

Leased Land size	Rent per square metre(USD)	TotalRent (USD)
ငှားရမ်းမြေအကျယ်အဝန်း	၀ စတုရန်းမီတာလျှင် ငှားရမ်းခ (USD)	ငှားရမ်းခစုစုပေါင်း(USD)
22,298 square metres	\$28.00	\$624,344.00
၂၂,၂၉၈ စတုရန်းမီတာ	၂၈ ဒေါ်လာ	၆၂၄၃၄၄.၀၀ ဒေါ်လာ

*Handwritten signature in blue ink.*

*Handwritten mark or signature in blue ink.*

၁၃၁၂

သဘောတူစာချုပ် ၂၀၂၀ ခုနှစ်၊ မတ်လ၊ (၁၂) ရက်

De Heus Myanmar Lease Agreement

Signed as an agreement

သဘောတူစာချုပ်အဖြစ် လက်မှတ်ရေးထိုးသည်

Date:

ရက်စွဲ: ၂၀၂၀ ခုနှစ်၊ မတ်လ (၁၃) ရက်

Signed by U Aung Shwe Tun in the presence of:

ရှေ့မှောက်တွင် ဦးအောင်ရွှေထွန်း မှ လက်မှတ်ရေးထိုးပါသည်။



*[Handwritten signature]*

Name U Aung Shwe Tun (Father) U Khwe Pu

အမည် ဦးအောင်ရွှေထွန်း (ဘ) ဦးခွေးပု

NRC No. 12/La Ta Na (Naing) 009548

မှတ်ပုံတင်အမှတ် ၁၂/လသန (နိုင်) ၀၀၉၅၄၈

Address : No. 55, 5-Floor, Bo Ywe Street,

Latha Township, Yangon Region.

လိပ်စာ - အမှတ် (၅၅)၊ (၅)လွှာ၊ ဝိုလ်ရွှေလမ်း

လသာမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။

Witness

မျက်မြင်သက်သေ

*[Handwritten signature]*

Name U Zaw Zaw Oo (Father) U Aung Myint

အမည် ဦးဇော်ဇော်ဦး (ဘ) ဦးအောင်မြင့်

NRC No. 12/La Ma Ta (Naing) 032006

မှတ်ပုံတင်အမှတ် ၁၂/လမတ (နိုင်) ၀၃၂၀၀၆

Address : No. 502, Win Shwe War Avenue,

Lanmadaw Township, Yangon Region.

လိပ်စာ - အမှတ် (၅၀၂)၊ ဝင်းရွှေပါရီလမ်း

လမ်းမတော်မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။

Signed by U Ye Aung in the presence of:

ရှေ့မှောက်တွင် ဦးရဲအောင် မှ လက်မှတ်ရေးထိုးပါသည်။



Name U Ye Aung (Father) U Khwe Pu

အမည် ဦးရဲအောင် (ဘ) ဦးရွှေပု

NRC No. 12/La Ta Na (Naing) 010159

မှတ်ပုံတင်အမှတ် ၁၂/လတာန (နိုင်) ၀၁၀၁၅၉

Address : No. 502, Win Shwe War Avenue,

Lanmadaw Township, Yangon Region.

လိပ်စာ - အမှတ် (၅၀၂)၊ ဝင်းရွှေဝါရိပ်သာ၊

လမ်းမတော်မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။



Witness

မျက်မြင်သက်သေ



Name U Min Min Tun (Father) U Hla Sein

အမည် ဦးမင်းမင်းထွန်း (ဘ) ဦးလှစိန်

NRC No. 12/Ka Ta Tia (Naing) 001837

မှတ်ပုံတင်အမှတ် ၁၂/ကတာတီး(နိုင်) ၀၀၁၈၃၇

Address : 215, 39<sup>th</sup> Street,

Kyauktada Township, Yangon Region.

လိပ်စာ - ၂၁၅၊ ၃၉ လမ်း၊

ကျောက်တံတားမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး



သဘောတူစာချုပ် ၂၀၂၀ ခုနှစ်၊ မတ်လ၊ (၁၂) ရက်

De Heus Myanmar Lease Agreement

Signed for and on behalf of De Heus Myanmar Ltd.  
by its duly authorised representative in the presence of:  
ရှေ့မှောက်တွင် De Heus Myanmar Ltd. ကိုယ်စား  
တရားဝင်ကိုယ်စားလှယ်မှ မှန်ကန်စွာ လက်မှတ်ရေးထိုးပါသည်။



Authorised Representative Name Jan Rulof Willemink  
တရားဝင်ကိုယ်စားလှယ်အမည် Jan Rulof Willemink  
PP No. NPC7CL3CL  
နိုင်ငံကူးလက်မှတ်အမှတ် NPC7CL3CL  
De Heus Myanmar Ltd. (Company Registration No. 108726032)  
De Heus Myanmar Ltd. (ကုမ္ပဏီမှတ်ပုံတင်အမှတ် 108726032)  
Address : Unit 16 to 20, 15<sup>th</sup> Floor, Tower 2,  
Myanmar Plaza, Bahan Township, Yangon Region.  
လိပ်စာ - Unit 16 to 20၊ ၁၅ ထပ်၊ တာဝါ (၂)  
မြန်မာပလာဇာ၊ ဗဟန်းမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။

ကုမ္ပဏီ၏ (၁၂.၃.၂၀၂၀) နေ့ ✓  
ဒါရိုက်တာအဖွဲ့ခံသွင်းအေး ပွတ်တမ်းအရ  
Mr. Jan Rulof Willemink ✓  
(PP No. NPC7CL3CL) မှလက်မှတ်  
ရေးထိုးပါသည်။





ဘွိုင်လာယာယီအသုံးပြုခွင့်လက်မှတ်

{ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆ အပိုဒ်ခွဲ (ဆ) }

စာအမှတ် ၇၈ / ၂၀၂၀-၂၁ / က.ခ.ဝ. / ယ. ၃၃ (က)

.....ဦးရဲခင်းဒိုင် (Dr. Heus Myanmar Ltd. အစာခင်းထုပ်ရုံ).....  
.....အမှတ် (၂၀၉၊ ၂၁၀၊ ၂၁၁)၊ မြောင်းတကာတော်မြို့နယ်၊ မြောက်ဘက်၊ မြို့နယ်၊  
.....ရန်ကုန်တိုင်းဒေသကြီး.....

.....အား.....

.....ကုမ္ပဏီ.....နိုင်ငံမှ

ထုတ်လုပ်သည့်ဘွိုင်လာအမှတ်.....ပါသော

သို့မဟုတ်ဘွိုင်လာမှတ်ပုံတင်အမှတ် မ.စ. ၆၄၉၄.....ဖြစ်သော ရေကြွယ်.....ဘွိုင်လာကို

ခွင့်ပြုဖိအား ၁၂ bar.....ဖြင့်လက်မှတ်ထုတ်ပေးသည့်နေ့မှ (၆)လအသုံးပြုခွင့်ရှိသည်။

ယင်းကာလအပိုင်းအခြားကျော်လွန်သည့်အခါ ထုတ်ပေးထားသည့် ဤယာယီအသုံးပြုခွင့်လက်မှတ်

ပျက်ပြယ်စေရမည်။



ဘွိုင်လာစစ်ဆေးရေးမှူး  
ဗဟိုယန္တရားရေးမှူး  
(ဘွိုင်လာစစ်ဆေးရေး)  
ရန်ကုန်တိုင်းဒေသကြီး

ရက်စွဲ။ ၂၁-၁၁-၂၀၂၁.....

မှတ်ချက် ။ ။ ဘွိုင်လာဥပဒေပုဒ်မ ၁၅ ပါပြဋ္ဌာန်းထားသည့် သက်ဆိုင်ရာအစိုးရဌာန အဖွဲ့အစည်းက  
လိုအပ်၍တောင်းဆိုသည့်အခါ ဤလက်မှတ်ကို တင်ပြရမည်။

## **APPENDIX – D**

# APPENDIX D

## Questionnaires for Household data of Indirect Affected Area

Sr. No	Township/ Village	Interviewer	Respondent	Q-1																		
				Household Particular																		
				Name	Relation- ship	Age	Nationality/ Religious	Occupation								Education						
Farmer/ Agriculture	Livestock	Casual Labour	Selling					Private Staff	Government Staff	Student	Dependent	Monastery	Primary	Secondary	High School	University	Educated	Never been to school				
1	Kone Ka Lay/ Hmawbi	Daw Tin Nwe Nwe Oo	Daw Aye Mu	U Shwe Aye	Head	55	Myanmar/ Buddhist	-	-	√	-	-	-	-	-	-	-	√	-	-	-	-
2				Daw Aye Mu	Wife	44		-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
3				Mg Yang Naing Soe	Son	18		-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
4				Mg Aung Naing Soe	Son	17		-	-	-	-	-	-	-	√	-	-	√	-	-	-	-
5				Ma Thu Zin Aung	Daughter	14		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
6				Mg Chit Ko	Son	6		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-
7	Kone Ka Lay/ Hmawbi	Daw Tin Nwe Nwe Oo	U Aye Naing	U Aye Naing	Head	42	Myanmar/ Buddhist	√	-	-	-	-	-	-	-	-	-	-	√	-	-	-
8				Daw Htay Yi	Wife	47		-	-	-	-	-	√	-	-	-	-	-	-	-	√	-
9				Mg Kaung Thu Han	Son	16		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
10	Kone Ka Lay/ Hmawbi	Daw Khin Thuzar Myint	U Soe Myint Aung	U Soe Myint Aung	Head	50	Myanmar/ Buddhist	-	-	-	-	-	√	-	-	-	-	-	√	-	-	-
11				Daw Khin Khin Nwe	Wife	43		-	-	-	√	-	-	-	-	-	-	√	-	-	-	-
12				Mg Pyone Bo Bo Myint Aung	Son	15		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
13				Ma Theint Thwe Thwe Myint Aung	Daughter	12		-	-	-	-	-	-	√	-	-	-	√	-	-	-	-
14				Mg Ye Bo Bo Myint Aung	Son	8		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-



### Questionnaires for Household data of Indirect Affected Area

Sr. No	Township/ Village	Interviewer	Respondent	Q-1																		
				Household Particular																		
				Name	Relation- ship	Age	Nationality/ Religious	Occupation								Education						
Farmer/ Agriculture	Livestock	Casual Labour	Selling					Private Staff	Government Staff	Student	Dependent	Monastery	Primary	Secondary	High School	University	Educated	Never been to school				
15	Kone Ka Lay/ Hmawbi	Daw Khin Thuzar Myint	U Aung Myint Kyu	U Aung Myint Kyu	Head	61	Myanmar/ Buddhist	-	-	-	√	-	-	-	-	-	-	√	-	-	-	-
16				Daw Ma Si	Wife	60		-	-	-	-	-	-	-	√	-	-	√	-	-	-	-
17				Mg Aung Lin Paing	Son	22		-	-	-	-	√	-	-	-	-	-	√	-	-	-	-
18				Ma Mya Mon Kyi	Daughter	24		-	-	-	√	-	-	-	-	-	-	√	-	-	-	-
19	Kone Ka Lay/ Hmawbi	Daw Khin Thuzar Myint	U Tin Mya	U Tin Mya	Head	70	Myanmar/ Buddhist	√	-	-	-	-	-	-	-	-	√	-	-	-	-	-
20				Daw Mya Nwe	Wife	68		√	-	-	-	-	-	-	-	-	√	-	-	-	-	-
21				Mg Soe Aung	Son	32		-	-	√	-	-	-	-	-	-	-	√	-	-	-	-
22				Mg Kyaw Kyaw Naing	Son	25		-	-	√	-	-	-	-	-	-	-	√	-	-	-	-
23	Kan Ka Lay/ Hmawbi	Daw May Thinzar Soe	U Than Shwe	U Than Shwe	Head	51	Myanmar/ Buddhist	√	-	-	-	-	-	-	-	-	√	-	-	-	-	-
24				Daw Mar Mar Cho	Wife	51		-	√	-	-	-	-	-	-	-	√	-	-	-	-	-
25				Ma Ei Ei Aung	Daughter	21		-	-	-	-	√	-	-	-	-	-	-	√	-	-	-
26				Ma Cherry Lin	Daughter	19		-	-	-	-	√	-	-	-	-	-	-	√	-	-	-
27				Ma San Mee	Daughter	16		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
28				Ma Sani Cho	Daughter	10		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-

### Questionnaires for Household data of Indirect Affected Area

Sr. No	Township/ Village	Interviewer	Respondent	Q-1																		
				Household Particular																		
				Name	Relation- ship	Age	Nationality/ Religious	Occupation								Education						
Farmer/ Agriculture	Livestock	Casual Labour	Selling					Private Staff	Government Staff	Student	Dependent	Monastery	Primary	Secondary	High School	University	Educated	Never been to school				
29	Kan Ka Lay/ Hmawbi	Daw May Thinzar Soe	Daw San Wai	U Khin Maung Myint	Head	62	Kayin / Buddhist	-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
30				Daw San Wai	Wife	60	Kayin/ Christian	-	√	-	-	-	-	-	-	-	√	-	-	-	-	-
31				Mg Thurein Htoo	Son	19	Kayin/ Christian	-	-	-	-	√	-	-	-	-	-	-	√	-	-	-
32	Kan Ka Lay/ Hmawbi	Daw May Thinzar Soe	Daw Naw Say Phaw	U Saw Myo Thant	Head	50	Kayin/ Christian	-	-	-	-	√	-	-	-	-	-	-	-	-	√	-
33				Daw Naw Say Phaw	Wife	48		-	-	-	-	-	-	-	√	-	-	-	-	-	√	-
34				Daw Pearl	Mother	74		-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
35				U Saw Myo Thein	Brother	52		-	-	-	-	-	-	-	√	-	-	-	√	-	-	-
36				Naw Mu Sannar	Daughter	16		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
37				Naw Yar Khay La	Daughter	13		-	-	-	-	-	-	√	-	-	-	√	-	-	-	-
38				Naw Mizuu Yee	Daughter	10		-	-	-	-	-	-	√	-	-	-	√	-	-	-	-
39	Kan Ka Lay/ Hmawbi	Daw May Thinzar Soe	U Than Naing	U Than Naing	Head	30	Kayin/ Buddhist	-	-	-	-	√	-	-	-	-	√	-	-	-	-	-
40				Daw Khin Khin Lay	Wife	29		-	√	-	-	-	-	-	-	-	√	-	-	-	-	-
41				Mg Toe Aung	Son	10		-	-	-	-	-	-	√	-	-	-	√	-	-	-	-
42				Mg Htut Hlaing Win	Son	6		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-

### Questionnaires for Household data of Indirect Affected Area

Sr. No	Township/ Village	Interviewer	Respondent	Q-1																		
				Household Particular																		
				Name	Relation- ship	Age	Nationality/ Religious	Occupation								Education						
Farmer/ Agriculture	Livestock	Casual Labour	Selling					Private Staff	Government Staff	Student	Dependent	Monastery	Primary	Secondary	High School	University	Educated	Never been to school				
43	Kan Ka Lay/ Hmawbi	Daw May Thinzar Soe	U Zaw Lay	U Zaw Lay	Head	45	Kayin/ Buddhist	-	-	√	-	-	-	-	-	-	-	√	-	-	-	-
44				Daw Than Nwe Oo	Wife	40		-	-	√	-	-	-	-	-	-	√	-	-	-	-	-
45				Ma Kyi Kyi Thaw	Daughter	5		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-
46	Kan Ka Lay/ Hmawbi	Daw May Thinzar Soe	U Zaw Win Htut	U Zaw Win Htut	Head	29	Kayin/ Christian	-	-	-	-	√	-	-	-	-	-	-	√	-	-	-
47				Daw Naw Phaw El Htoo	Wife	29		-	-	-	-	-	-	-	√	-	-	-	-	-	√	-
48				Naw Thaw Thi Htoo	Daughter	13day		-	-	-	-	-	-	-	√	-	-	-	-	-	-	√
49	Kan Ka Lay/ Hmawbi	Daw Ou Ou Thu	U Win Oo	U Win Oo	Head	56	Kayin/ Buddhist	√	-	-	-	-	-	-	-	-	√	-	-	-	-	-
50				Daw San Myint	Wife	46		-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
51				Mg Nay Lin Oo	Son	15		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
52				Mg Naing Lin Oo	Son	12		-	-	-	-	-	-	√	-	-	-	√	-	-	-	-
53				Ma Thet Mon Htwe	Daughter	8		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-
54				Ma Zar Zar Htwe	Daughter	5		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-

### Questionnaires for Household data of Indirect Affected Area

Sr. No	Township/ Village	Interviewer	Respondent	Q-1																		
				Household Particular																		
				Name	Relation- ship	Age	Nationality/ Religious	Occupation								Education						
Farmer/ Agriculture	Livestock	Casual Labour	Selling					Private Staff	Government Staff	Student	Dependent	Monastery	Primary	Secondary	High School	University	Educated	Never been to school				
55	Kan Ka Lay/ Hmawbi	Daw Ou Ou Thu	Daw Naw Lay Phaw	U Saw Aung Nan Cho	Head	57	Kayin/ Christian	-	-	-	-	-	-	-	√	-	-	-	√	-	-	-
56				Daw Naw Lay Phaw	Wife	53		-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
57				Naw Sal Sal Moe	Daughter	33		-	-	-	-	√	-	-	-	-	√	-	-	-	-	-
58				Saw El Nay Thaw	Son	20		-	-	-	-	√	-	-	-	-	-	√	-	-	-	-
59				Naw Mee Mee Khae	Daughter	17		-	-	-	-	-	-	√	-	-	-	-	√	-	-	-
60				Nan Kalayar Htwe	Daughter	9		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-
61	Kan Ka Lay/ Hmawbi	Daw Ou Ou Thu	Daw Pan Yi	U Khin Maung Zin	Head	31	Kayin/ Buddhist	√	-	-	-	-	-	-	-	-	√	-	-	-	-	-
62				Daw Pan Yi	Wife	30		-	-	-	-	-	-	-	√	-	√	-	-	-	-	-
63				Mg Kyaw Zin Hter	Son	7		-	-	-	-	-	-	√	-	-	√	-	-	-	-	-
64				El Balu Phaw	Daughter	3 month		-	-	-	-	-	-	-	√	-	-	-	-	-	-	√
Grand Total								6	3	5	3	9	2	21	15	-	27	16	15	-	4	2

[illegible]



[illegible]

[illegible]

[illegible]

**Questionnaires for Household data of Indirect Affected Area**

Sr. No	Township/ Village	Q-2	Q-3										Q-4													
		-	Does one of your familyworks away from home.										Property													
			Who					Where					Housing				Implements						Home Property			
			husband	wife	son	daughter	other	capital	nearest district	oversea	other	Bamboo- Thatch	Bamboo- CGI	Timber-CGI	Brick- Concrete	Cart	Boat	Bicycle	Motor bike	Farm Truck	Car	Refrigerator	TV	Radio	Other	
55	Kan Ka Lay/ Hmawbi	57(year)	-	-	-	-	-	-	-	-	-	-	√	-	-	-	-	-	√	-	-	-	-	-	-	-
56			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	Kan Ka Lay/ Hmawbi	31(year)	-	-	-	-	-	-	-	-	-	-	-	√	-	-	-	-	√	-	-	-	-	-	-	-
62			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Grand Total</b>		-	-	-	-	-	-	-	-	-	-	1	5	7	1	-	-	5	11	-	-	-	8	3	2	

## Questionnaires for Household data of Indirect Affected Area

[illegible]



## Questionnaires for Household data of Indirect Affected Area

[illegible]

## Questionnaires for Household data of Indirect Affected Area

[illegible]

## Questionnaires for Household data of Indirect Affected Area

[illegible]

**Questionnaires for Household data of Indirect Affected Area**

Sr. No	Township/ Village	Q-5												Q-6					Q-7					Q-8			
		Farming												Livestock					Drinking Water					Type of Toilet			
		Crop (acre)				Production				Price (Kyats)*1000				Cow	Goat	Duck	Chicken	Pig	River/ Stream	Open Well	Lake	Tube Well	Pipe Line	Flush toilet	Pour flush toilet	Double vault compost latrine	Any-where
		Paddy	Maize	Ground Nut	Betel	Paddy	Maize (Viss)	Ground Nut (Basket)	Betel	Paddy	Maize	Ground Nut (Basket)	Betel														
55	Kan Ka Lay/ Hmawbi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	√	-	-	√	-	-		
56		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
57		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
58		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
59		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
60		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
61	Kan Ka Lay/ Hmawbi	-	-	-	1	-	-	-	700	-	-	-	-	-	-	-	-	-	-	√	-	-	√	-	-		
62		-	-	-		-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
63		-	-	-		-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
64		-	-	-		-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Grand Total		-	-	-	-	-	-	-	-	-	-	-	-	4	10	45	40	6	-	1	-	13	-	-	14	-	-

### Questionnaires for Household data of Indirect Affected Area

[illegible]

### Questionnaires for Household data of Indirect Affected Area

Sr. No	Township/ Village	Q-9					Q-10			Q- 11			Q-12	Q-13	
		Electricity					If electricity is not available what are the current energy sources?			Where you get electricity?			Average electricty use per month total unit	Do you agree / Any comment on this project	
		24 hour	12 hour	6 hour	3 hour	None	Lightion	Fuel	Others	Govern-ment	Private	Village Lighting Committee		Yes	No
										Unit rate (Kyat)	Unit rate (Kyat)	Unit rate (Kyat)			
15	Kone Ka Lay/Hmawbi	-	-	-	-	√	Battery	Fire Wood	-	-	-	-	-	√	-
16		-	-	-	-	-				-	-	-	-	-	-
17		-	-	-	-	-				-	-	-	-	-	-
18		-	-	-	-	-				-	-	-	-	-	-
19	Kone Ka Lay/Hmawbi	-	-	-	-	√	Battery	Fire Wood	-	-	-	-	-	√	-
20		-	-	-	-	-				-	-	-	-	-	-
21		-	-	-	-	-				-	-	-	-	-	-
22		-	-	-	-	-				-	-	-	-	-	-
23	Kan Ka Lay/Hmawbi	-	-	-	-	√	Solar	Fire Wood	-	-	-	-	-	√	-
24		-	-	-	-	-				-	-	-	-	-	-
25		-	-	-	-	-				-	-	-	-	-	-
26		-	-	-	-	-				-	-	-	-	-	-
27		-	-	-	-	-				-	-	-	-	-	-
28		-	-	-	-	-				-	-	-	-	-	-



### Questionnaires for Household data of Indirect Affected Area

[illegible]

### Questionnaires for Household data of Indirect Affected Area

[illegible]

### Questionnaires for Household data of Indirect Affected Area

[illegible]

## **APPENDIX – E**

Impact Assessment Matrix for Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

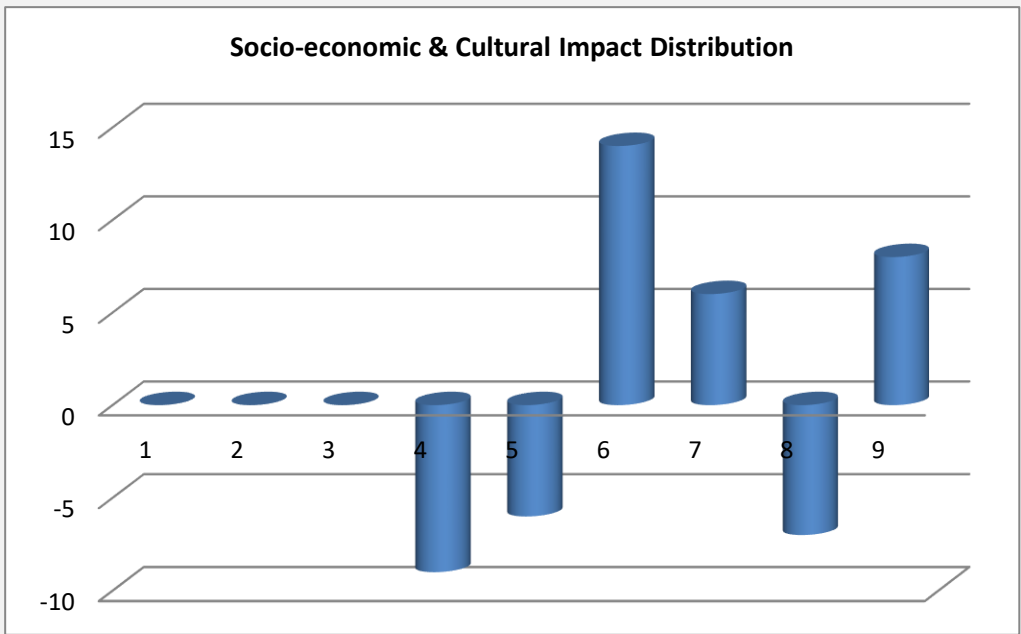
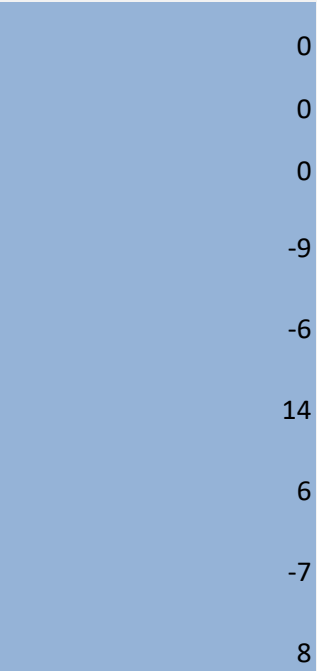
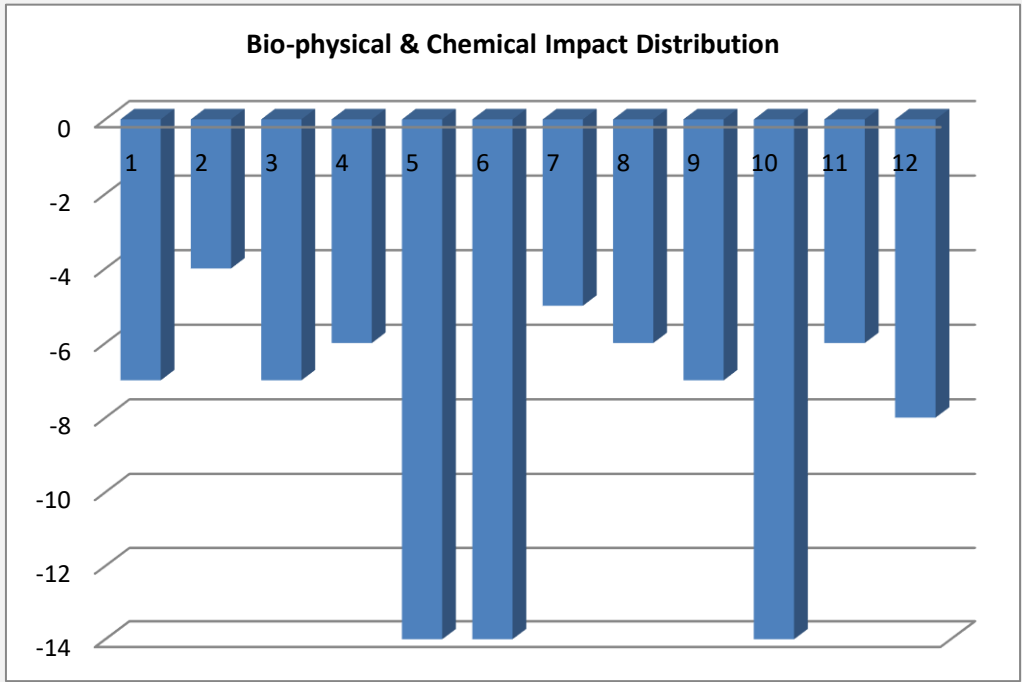
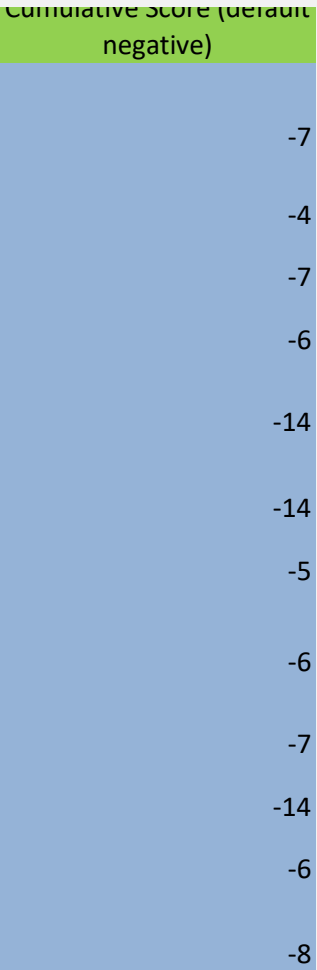
CONSTRUCTION PHASE IMPACTS for Environmental and Social Impact Assessment of Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon							
Ref.	Impact/Issue	Comment/Description of Impact	Extent	Duration	Magnitude/ Intensity	Probability	Significance
Bio-Physical & Chemical							
BPC/1	Changes in surface water quality	Soil excavation works affect the surface water quality (nearby creek / Hlaing River)	2	3	1	2	low
BPC/2	Changes in groundwater quality	Risk of disturbance to underground water resources due to construction work	1	1	1	2	low
BPC/3	Changes to drainage patterns	Alteration fo the natural drainage system due to construction	2	3	1	2	low
BPC/4	Changes in rates of erosion and siltation	Some sitlation may happen due to soil excavation works near the drainage channels	1	3	1	2	low
BPC/5	Changes to air quality	Air quality will be changed because of dust, particulate matter during construction works	2	3	2	2	medium
BPC/6	Changes to ambient noise levels	Noise levels will be significant during construction disturbing the biota in the environment	2	3	2	2	medium
BPC/7	Changes to aquatic biota	Changes in aquatic biota due to construction works	1	2	1	2	low
BPC/8	Changes to terrestrial biota	Some changes expected in terrestrial biota and habitation due to excavation of soil masses	1	3	1	2	low
BPC/9	Changes to disease vector populations	Health risk to construction laborors during construction period (water borne / dust)	2	3	1	2	low
BPC/10	Changes to land cover	Significant change in land cover due to excavation works	2	3	2	2	medium
BPC/11	Change in Natural Heritage Site	No change in natural heritage	1	3	1	2	low
BPC/12	Changes to areas of natural habitat	Due to the changes in vegetation in land and water, natural habitat may change to a certain extent	2	3	1	3	low
Socio-Economic & Cultural							
SEC/1	Changes involving loss of private assets	No significant private asset disburbed due to construction works	0	0	0	0	low
SEC/2	Changes involving loss of cultural heritage	No significant cultural heritage at proposed project area	0	0	0	0	low
SEC/3	Changes involving displacement of people	No Displacement of inhabitants.	0	0	0	0	low
SEC/4	Changes to local traffic patterns	Construction works may change traffic pattern to a certain extent.	3	3	1	3	medium
SEC/5	Changes to fisheries	Not much changes in fishery expected at nearby water body	1	3	1	2	low
SEC/6	Changes in local wage labour incomes/livelihood opportunities	Laborers are employed.	2	3	2	2	medium
SEC/7	Changes in local trade/commercial incomes/opportunities	No significant local trade / commercial incomes during construction phase.	2	2	1	2	low
SEC/8	Changes in visual amenity	No significant amenity to vision during construction period; distubed soil appears instead of natural beauty of landscape.	2	3	1	2	low
SEC/9	Changes to public infrastructure/community resources	Change in infrastructure due to construction works	1	2	2	1	low

# Impact Assessment Matrix for Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

OPERATIONAL PHASE IMPACTS for Environmental and Social Impact Assessment of Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon							
Green for positive impact			score 1, 2 or 3	score 1, 2 or 3	score 1, 2 or 3	score 1, 2 or 3	
Ref.	Impact/Issue	Comment/Description of Impact	Extent	Duration	Magnitude/ Intensity	Probability	Significance
Bio-Physical & Chemical							
BPC/1	Changes in surface water quality	Risk of some changes in water quality at nearby water body	2	3	1	2	low
BPC/2	Changes in groundwater quality	No significant potential pollution to ground water sources	2	3	1	2	low
BPC/3	Changes to drainage patterns	Some drainage pattern change may occur due to new infrastructure	2	3	1	2	low
BPC/4	Changes in rates of erosion and siltation	No risk of Soil erosion and siltation	1	3	1	2	low
BPC/5	Changes to air quality	Some changes in Air Quality may occur due to fine particulate matter and dust, potential odor during operation	2	3	2	2	medium
BPC/6	Changes to ambient noise levels	Some change in Noise Level may happen due to the sound of boiler operation	2	3	2	2	medium
BPC/7	Changes to aquatic biota	No significant changes in Aquatic biota	1	3	1	2	low
BPC/8	Changes to terrestrial biota	Changes to terrestrial biota	1	3	1	2	low
BPC/9	Changes to disease vector populations	Health risk	2	3	2	2	medium
BPC/10	Changes to land cover	No further land cover change during operational phase	1	3	1	2	low
BPC/11	Change in natural heritage	No change in natural heritage after construction work	0	0	0	0	low
BPC/12	Changes to areas of natural habitat	No further significant impact in project area	1	3	1	2	low
Socio-Economic & Cultural							
SEC/1	Changes involving loss of private assets	No potential impact	0	0	0	0	low
SEC/2	Changes involving loss of cultural heritage	No impact in operational phase.	0	0	0	0	low
SEC/3	Changes involving displacement of people	No potential social impact	0	0	0	0	low
SEC/4	Changes to local traffic patterns	No potential changes in traffic patterns	3	3	1	3	medium
SEC/5	Changes to fisheries	No changes to fisheries	0	3	0	0	low
SEC/6	Changes in local wage labour incomes/livelihood opportunities	Possibility of Increased income and livelihood opportunities due to the project.	3	3	1	3	medium
SEC/7	Changes in local trade/commercial incomes/opportunities	Possibility of Increased income and livelihood opportunities due to the project.	3	3	1	3	medium
SEC/8	Changes in visual amenity	Enhanced infrastructure appears with natural landscape.	2	3	1	3	low
SEC/9	Changes to public infrastructure/community resources	Expected infrastructure development	2	3	1	2	low



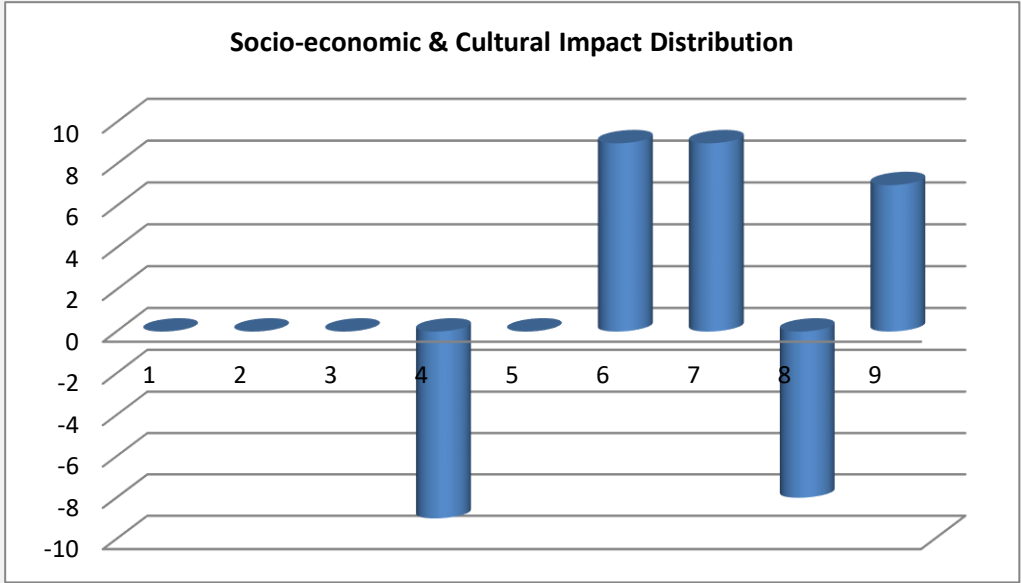
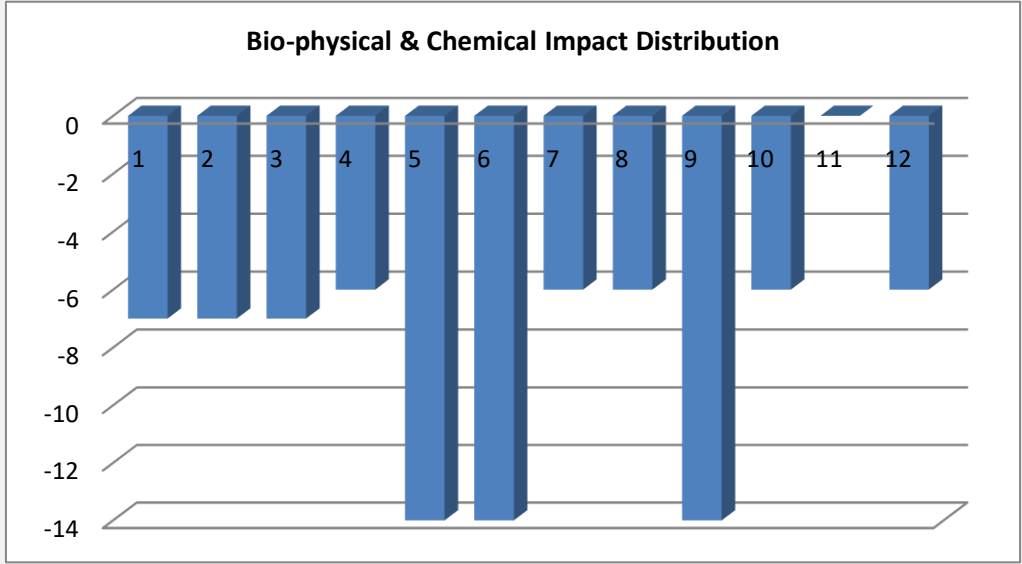
# Impact Assessment Matrix for Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region



# Impact Assessment Matrix for Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

Cumulative Score (default negative)

-7  
-7  
-7  
-6  
-14  
-14  
-8  
-6  
-10  
-6  
-12  
-14  
-6  
0  
-6



Impact Assessment Matrix for Aqua Feed Mill Factory Project, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region

Guidance for Use				
Score	Extent	Duration	Magnitude	Probability
1	On site: Within the works/site area or immediate surroundings	Short: The impact is  short term (0- 12 months) or intermittent	Low: No environmental functions and processes are altered  No or minimal change to socio-economic condition	Low
	Locally: Effects measurable/noticeable outside the works area and immediate surroundings	Medium: Medium term (1-2 years - construction phase)	Medium: Natural ecosystems are modified  Changes are experienced to socio-economic condition	Medium
	Beyond: The activity has impact outside the project area	Long: the impact persists beyond the construction phase for years or the operational life of the project	High: Environmental functions altered  Socio-economic conditions highly modified  Effects may be permanent or irreversible.	High

## **APPENDIX – F**

# Potential Environmental Health impact Assessment For fish and livestock feed production factory. (Myanmar Aqua Plant, Feed Mill)

## APPENDIX F

### 1.Introduction

NEPS team comprising two environmental engineers and one public engineer visited to Fish and Livestock Feed Production Factory in Myaung Dagar ward at Mwwbe township on 6.12.21. Our objectives are to investigate the present situation of the factory from the environmental health control aspect and social aspect as well.

### 2. Responsible persons, we met and discussed are:

- 1 U Ye Min Pai \_ Manager
- 2 U Thiri \_ Safety Officer
- 3 U Sithu Oo \_ Quality administrative Officer
- 4 U Myo Win Htwe \_ Quality administrative Officer

### 3. Findings:

With reference to some parameter from that presented in environmental quality monitoring report on De Hews Myanmar Ltd, by Hexagonal Angle international consultants Co. Ltd during november, 2021, the present report was made and interpreted as the followings.

#### 3(a) Location

The factory is located in north latitudes  $17^{\circ} 9' 25.19''$  and east longitudes  $95^{\circ} 58' 7.89''$ . Average air velocity (24hrs) is 0.48 m/s.

### 3(b) Gaseous emission

One of the air pollution is toxicant gaseous emission from the process. Categories of gases emitted depend on the types of raw materials being used in the process. In this factory, there are some toxic gases viz CO, SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>x</sub>, particulates and others according to Hexagonal Angle international consultants Co. Ltd report. The worse is the concentration of a few gases are higher than the TLV (Threshold Limit Value) : They are SO<sub>2</sub> = 118.84 ug/m<sup>3</sup> ( TLV = 20 ug/m<sup>3</sup> at 24 hr), NO<sub>2</sub> = 42.58 ug/m<sup>3</sup> (TLV = 40 ug/m<sup>3</sup> in 1 yr) and the worst is even CO and O<sub>3</sub> are detected.

Physiological action of gases and vapours may affect human health, particularly the workers and nearby community. CO<sub>2</sub> and NO<sub>2</sub> would cause oxygen deficiency in air, lungs and blood. Oxygen use blocked in the cells. SO<sub>2</sub> cause irritate lower trachema and brochina. NO<sub>x</sub> also restricts plant growth. Also, it is a greenhouse gas which cause global climate change i.e global warming. O<sub>3</sub> also irritates bronchides and alveolar sacs. Thats why air pollution contributes significantly as a cause or aggravating factor for the medical conditions viz acute respiratory infections, chronic bronchitis, chronic constructive ventilatory diseases, pulmonary emphysema, bronchial asthma and lung cancer ( H.Heimann).

In addition, this pollution wil increase morbidity related respiratory diseases particularly among infants and children. Suspended nitrate level of 3.8 ug/m<sup>3</sup> or more produced increased respiratory diseases in family groups (ET Chanlett).



### 3(b) light and ventilation

Each floor of the factory has been installed with 70 ceiling electric bulbs and fluroscent lamps. That is seemed that lighting is enough for working because lighting intensity specified is 5 watt/ft<sup>2</sup> in workplace.

According to direct observation, not much enhaust and exhaust fans are there. They rely on air conditioning system for ventilation. Besides, they want to control humidity by this system. Actually, almost 10 ft of fresh air/person/ min is required.

### 3(c) Heat and humidity

According to Hexagonal Angle international consultants Co. Ltd report, air temperature (24 hr) is 20.75 °C and relative humidity (24 hr) 70.85% in the working area. They keep daily temperature and humidity records in the room.

The earth and human body raditate principally at  $3 \times 10^3$  Hz (10 um). In most situation, evaporation is the major mean of cooling for man as the air temperature rises above 28.6°C (75°F). Relative humidity is a paramount factor in the success of evaporative cooling.

The exchange between the human body and the results from a balance of 5 rates.

1. The rate of body heat production  $q_m$ .
2. The rate of convertive transfer  $q_c$ .
3. The rate of raditatin  $q_r$ .

4. The rate of evaporative cooling  $q_E$ .

5. The rate of change of heat stored in body  $q_s$ .

The body maintains thermal equilibrium when  $q_m = 0$ .

The relationship of the 5 rates is stated by

$$q_m = \pm q_c \pm q_r - q_E \pm q_s$$

The responses of the 5 rates of heat exchange as the dry bulb air temperature rises from  $10^\circ\text{C}$  ( $50^\circ\text{F}$ ) to  $43^\circ\text{C}$  ( $110^\circ\text{F}$ ) and relative humidity of 45%.

The body's capacity for storage of metabolic heat or excess heat received is quite limited. Any condition which does not permit loss of all metabolic heat result in storage and an immediate body temperature rise. A few individuals can continue to work without body temperature rises above  $39^\circ\text{C}$  ( $101^\circ\text{F}$ ) to nearly  $40^\circ\text{C}$  ( $104^\circ\text{F}$ ), but most people drop sharply in productivity or just drop. In an external temperature about equal to body temperature, a person can hold his or her thermal equilibrium by producing 1 litre of sweat per hour. That is a high rate of sweat loss and cannot be sustained for a whole working day. It does not exceed 24 litre in 24 hr.

The physiological effect of heat stress follows hooke's law of the mechanic of the materials that is the material within the elastic limit, the strain (deformation or other change) is proportional to stress or load. All the structural members bearing the load return to normal shape when the stress is removed. When the stress produce a strain beyond the elastic limit, deformation is permanent and well may tear the member asunder in complete failure.

Heat stress on man follows Hooke's Law with three evident measureable strains:

1. Increase sweat loss
2. Increase heart rates
3. Increase heat storage causing rises in deep body temperature. Reflected in rises in rectal temperature. When these strains exceed the elastic limit, each in turn results in the acute failure signaled by:
  - 1 heat cramps
  - 2 heat prostration or exhaustion
  - 3 heat stroke or sun stroke

### 3(d) Noise pollution

Unwanted sound is defined as noise which is a pollution of the environment. It can affect the human beings and animals too. While visiting, noise is not felt. Probably, it is a maintenance day and only a few forklift machines and operators are working by then. At the industrial area, sound level is standardized 70 dBA by NEQG but average dBA of the factory in 24 hr is 66.19 dBA. Though, Sound Pressure Level (SPL) is not known. SPL = 0.0002 u bar is the TLV for human beings. At 90 dBA for 8 days for 45 years, about 10% of the workers exposed will suffer a 10% hearing impairment. Besides, negative effects on flying of nestings birds and encourage the migration. Other effects are hearing loss of workers, interrupting speaking and sleepingness and so on.

### 3(e) Burn accidents and migration

It was seen that hot water supply pipes were being covered

with heat insulating materials and fire extinguishers are already standby in position (See photo) are the good practice.

#### 4. Sanitation

Toilet facilities are enough for the present workers though they are away from the working area. For water supply, water quality testing results show not bad.

#### Conclusion

Finally, from my opinion, this type of factory is necessary for our country which based on agriculture and livestock husbandry economic one. Only when fish and livestock gains nutritious food, men eating this kind of fish and livestock will grow and develop as the strong and healthy nation as who may become effective productive force for our country. But in future, a well plan with GMP for increased worker population is needed to prepare.

At present, it was seen esthetically neat and tidy factory and odour is not felt, surprisingly. Solid wastes are collected by township municipality daily. Formally, bamboo-forest Myaung Dagar village becomes as a part of Mawbe township

Date:

To: Director  
Environmental Conservation Department  
Ministry of Natural Resources and Environmental Conservation  
Office No.(53), Ottrathiri Township  
Nay Pyi Taw, Myanmar

cc: Director General  
Ministry of Natural Resources and Environmental Conservation  
Office No.(53), Ottrathiri Township  
Nay Pyi Taw, Myanmar

**Subject: Environmental Impact Assessment Report in regard to the Aqua Feed Mill Factory Project, Myaung Da Gar Industrial Zone, Hmawbi Township, Yangon Region**

**Ref: Approval Letter No. (EIA-1/4-Ka 1504/2021) dated 9/9/2021 of Environmental Conservation Department with directives for the earlier submitted: "Scoping Report of ESIA De Heus Aqua Feed Mill Factory Project, Myaung Da Gar Industrial Zone, Hmawbi Township, Yangon Region."**

Dear Sir,

We refer to the captioned **Environmental Impact Assessment**, which has been prepared and finalized by the National Engineering and Planning Services Co., Ltd. in accordance with the Environmental Conservation Law, Rules and Procedures under the instructions of Ministry of Natural Resources and Environmental Conservation dated on February 27, 2015 and revised on November 5, 2017.

Intending to be legally bound hereby and financially liable to the Ministry of Natural Resources and Environmental Conservation hereunder, we:

Endorse and confirm to Ministry of Natural Resources and Environmental Conservation

- To implement the EMP, all Project commitments, and conditions;
- To ensure that all contractors and subcontractors of the Project comply fully with all applicable Laws, the Rules, this Procedure, the EMP, Project commitments and conditions when providing services to the Project; and
- To be responsible for, and to fully and effectively implement the requirements set forth in Environmental Compliance Certificate (ECC), applicable Laws, Rules, EIA Procedure and standards.

The issuance of this confirmation and undertaking has been duly authorized by the De Heus Myanmar Company Limited who has signed below are attached as schedules hereto.

  
Jan Rulof Willemink  
Managing Director  
De Heus Myanmar Ltd.

[Name and Position of Authorized Person of Developer]

**De Heus Myanmar Ltd.**

Plot No. 309, 310, 311,

Myaung Dakar Industrial Zone, Hmawbi Township, Yangon, Myanmar.



Date: 03 January 2022

To: Director  
Environmental Conservation Department  
Ministry of Natural Resources and Environmental Conservation  
Office No.(53), Ottrathiri Township  
Nay Pyi Taw, Myanmar

cc: Director General  
Ministry of Natural Resources and Environmental Conservation  
Office No.(53), Ottrathiri Township  
Nay Pyi Taw, Myanmar

**Subject: Environmental Impact Assessment Report in regards to the Aqua Feed Mill Factory Project, Myaung Da Gar Industrial Zone, Hmawbi Township, Yangon Region (the ESIA including EMP)**

**Ref: Approval Letter No. (EIA-1/4-Ka 1504/2021) dated 9/9/2021 of Environmental Conservation Department with directives for the earlier submitted: "Scoping Report of ESIA De Heus Aqua Feed Mill Factory Project, Myaung Da Gar Industrial Zone, Hmawbi Township, Yangon Region."**

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Endorse and confirm to Ministry of Natural Resources and Environmental Conservation

- a. The accuracy and completeness of the **Environmental Impact Assessment**,
- b. Confirm and undertake to Ministry of Natural Resources and Environmental Conservation that the **Environmental Impact Assessment** has been prepared in strict compliance with applicable Environmental Conservation Law, Rules and Procedures including Environmental Impact Assessment Procedure: Paragraph 35 (2015), and other related laws and regulations for the type of project,
- c. Comply fully with any and all commitments for Third Party Organization.

The issuance of this confirmation and undertaking has been duly authorized by the National Engineering and Planning Services Co., Ltd., who has signed below are attached as schedules hereto.

U Aye Myint  
Senior Water Resources Engineer  
ESIA Team Leader  
National Engineering and Planning Services Co., Ltd.





ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်  
သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန  
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန  
ညွှန်ကြားရေးမှူးချုပ်ရုံး

စာအမှတ်၊ အီးအိုင်အေ-၁/၄ - က(၁၅၁၄ / ၂၀၂၁)  
ရက်စွဲ၊ ၂၀၂၁ ခုနှစ်၊ စက်တင်ဘာလ ၉ ရက်

သို့

မန်နေဂျင်းဒါရိုက်တာ

De Heus Myanmar Co., Ltd.

အကြောင်းအရာ။

De Heus Myanmar Co., Ltd ၏ ရေသတ္တဝါအစားအစာထုတ်လုပ်ခြင်း နှင့် ဖြန့်ဖြူးရောင်းချခြင်းလုပ်ငန်း (Aqua Feed Mill Factory Project) နှင့်ပတ်သက်၍ နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာအပေါ် အတည်ပြုကြောင်း ပြန်ကြားခြင်း

ရည်ညွှန်းချက်။

- (၁) De Heus Myanmar Co., Ltd ၏ ၅-၂-၂၀၂၀ ရက်စွဲပါစာအမှတ် ၀၃၊ ၂၀၂၀
- (၂) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၈-၇-၂၀၂၁ ရက်စွဲပါစာအမှတ်၊ အီးအိုင်အေ-၁/၄-က (၁၀၁၃/၂၀၂၁)
- (၃) သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ ပြည်ထောင်စုဝန်ကြီးရုံး၏ ၁၄-၇-၂၀၂၁ ရက်စွဲပါစာအမှတ်၊ (သစ်တော) ၃(၂)/၁၆ (ဃ)(၁၉၅၂/၂၀၂၁)

၁။ အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ ရန်ကုန်တိုင်းဒေသကြီး၊ မှော်ဘီမြို့နယ်၊ မြောင်းတကာစက်မှုဇုန်၊ မြေကွက်အမှတ်(၃၀၉၊ ၃၁၀၊ ၃၁၁)၊ မြေဧရိယာ (၅.၅)ဧကတွင် နိုင်ငံခြားသား ရင်းနှီးမြှုပ်နှံမှုဖြင့် De Heus Myanmar Co., Ltd မှ ရေသတ္တဝါအစားအစာထုတ်လုပ်ခြင်းနှင့် ဖြန့်ဖြူးရောင်းချခြင်းလုပ်ငန်း (Aqua Feed Mill Factory Project) အတွက် နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအစီရင်ခံစာ (Scoping Report) ကိုရည်ညွှန်း(၁)ပါစာဖြင့် တင်ပြလာပါသည်။

၂။ အဆိုပြုစီမံကိန်းသည် ရေသတ္တဝါ အစားအစာထုတ်လုပ်ခြင်း နှင့် ဖြန့်ဖြူးရောင်းချခြင်း လုပ်ငန်း (Aqua Feed Mill Factory Project) ရင်းနှီးမြှုပ်နှံမှု အမေရိကန်ဒေါ်လာ(၁၄.၇၂)သန်း၊ ရာနှုန်းပြည့် နိုင်ငံခြားသား ရင်းနှီးမြှုပ်နှံမှုဖြင့် ကုန်ကြမ်းပစ္စည်းများဖြစ်သော ပဲပိစပ်၊ ဂျုံ၊ ပြောင်း၊ ဖွဲနှင့် အခြားဖြည့်စွက်အာဟာရ၊ ဗိုက်တာမင် အားဆေးများကို ပြည်တွင်း၊ ပြည်ပမှ တင်သွင်းပြီး ကုန်ချောများကို ပြည်တွင်းရေချိုငါးမွေးမြူရေး လုပ်ငန်းများ အတွက်ဖြန့်ဖြူးရောင်းချမည်



ဖြစ်ပြီး ထုတ်လုပ်မှု (6500 tons/month) နှင့် ရင်းနှီး မြှုပ်နှံမှုသက်တမ်း (၅၀)နှစ်ဖြစ်ကြောင်း၊ စက်မှုဇုန်အတွင်းတည်ရှိပြီး တည်ဆောက်ရေးကာလကို ၂၀၁၈ခုနှစ်၊ အောက်တိုဘာလတွင် စတင်ပြီး ၂၀၁၉၊ နိုဝင်ဘာလတွင် စီးပွားဖြစ်ထုတ်လုပ်မှုစတင်ခဲ့ကြောင်း၊ ထုတ်လုပ်မှုအတွက် ကုန်ကြမ်းများ သိုလှောင်ရုံ၊ ထုတ်လုပ်မှုအဆောက်အဦ၊ ဆိုင်လိုများ၊ ကုန်ချောသိုလှောင်ရုံ၊ ထုပ်ပိုးအိတ်သိုလှောင်ရုံ၊ ရေနွေးငွေ့ဘွိုင်လာ၊ Ash Storage၊ IBC Plant စသည့် အခြေခံ အဆောက်အဦများအသုံးပြု၍ ကုန်ကြမ်းများပြင်ဆင်ခြင်း၊ ရောစပ်ခြင်း၊ ချိန်တွယ်ခြင်း၊ ကြိတ်ခွဲခြင်း၊ အခြောက်ခံခြင်း၊ စစ်ချခြင်း၊ coating တင်ခြင်း၊ အအေးခံခြင်း၊ ထုပ်ပိုးခြင်း၊ သိုလှောင်ခြင်း၊ ဖြန့်ဖြူးခြင်း စသည့် အဆင့်များဖြင့် ထုတ်လုပ်မှုဆောင်ရွက်မည်ဖြစ်ကြောင်း၊ လိုအပ်သော ရေအရင်းအမြစ်ကို စီမံကိန်းဧရိယာအတွင်း အဝီစိတွင်းတူးဖော်ရယူခြင်း၊ လျှပ်စစ်ဓါတ်အားကို ဇုန်စီမံခန့်ခွဲမှုမှတစ်ဆင့် ပင်မဓါတ်အားလိုင်းမှ ရယူခြင်း၊ အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများကို မြို့နယ် စည်ပင်သာယာရေး အဖွဲ့နှင့်ချိတ်ဆက် ဆောင်ရွက် ခြင်း၊ စွန့်ပစ်အရည်များကို bio-septic tank အသုံးပြုပြီး ပြန်လည်အသုံးပြုနိုင်သော စွန့်ပစ်ပစ္စည်းများကို ထုတ်လုပ်မှုလုပ်ငန်းတွင် ပြန်လည် အသုံးပြုမည် ဖြစ်ကြောင်း စိစစ်တွေ့ရှိရပါသည်။

၃။ အဆိုပြုစီမံကိန်းနှင့်စပ်လျဉ်း၍ တင်ပြလာသော နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်း အစီရင်ခံစာတွင် အခန်းအလိုက် အောက်ပါအတိုင်းဖော်ပြထားပါသည်-

- (က) နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်း အစီရင်ခံစာ၏ အကျဉ်းချုပ် အစီရင်ခံစာကို မြန်မာ ၊ အင်္ဂလိပ်နှစ်ဘာသာဖြင့် ဖော်ပြထားကြောင်း၊
- (ခ) မူဝါဒ၊ ဥပဒေ၊ အဖွဲ့အစည်းဆိုင်ရာ မူဘောင်နှင့်ပတ်သက်၍ စီမံကိန်းမှ လိုက်နာ ဆောင်ရွက်မည့် ပြည်တွင်းနှင့်နိုင်ငံတကာ ဥပဒေ၊ စည်းမျဉ်းစည်းကမ်းများ၊ စံသတ်မှတ်ချက်များ ဖော်ပြထားကြောင်း၊
- (ဂ) စီမံကိန်းအကြောင်းအရာနှင့် အခြားနည်းရွေးချယ်ခြင်းနှင့်ပတ်သက်၍ စီမံကိန်း တွင်အသုံးပြုမည့် Process Flow/ Steps, Production Capacity၊ layout plan, process flow diagram များဖော်ပြထားပြီး၊ လုပ်သား (၇၀) ဦးဖြင့် လည်ပတ် ဆောင်ရွက်မည်ဖြစ်ကြောင်း၊
- (ဃ) ပတ်ဝန်းကျင်ဆိုင်ရာ အကြောင်းအရာ ဖော်ပြချက်များနှင့်ပတ်သက်၍ ambient water quality baseline data ကို ကန်ကလေးကျေးရွာနှင့် စီမံကိန်းဝန်းအတွင်း Tube Well၊ လှိုင်မြစ်ရေတို့မှ ကောက်ယူတိုင်းတာထားပြီး သတ်မှတ်ထားသော guideline values များအတွင်း တည်ရှိကြောင်း၊
- (င) ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာ ထိခိုက်နိုင်မှုများအား ဆန်းစစ်ဖော်ထုတ်ခြင်း နှင့်လျော့နည်းသက်သာစေမည့် နည်းလမ်းများနှင့် ပတ်သက်၍ construction၊



operation phase တွင် ဖြစ်ပေါ်နိုင်သော ထိခိုက်မှုများကိုဖော်ပြထားပြီး အဓိက ဖြစ်ပေါ်လာနိုင်သည့် ထိခိုက်မှုများနှင့် လျော့ပါးစေရေး နည်းလမ်းများကို ထည့်သွင်းဖော်ပြထားကြောင်း၊

- (စ) အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်း၊ အများပြည်သူသို့ ထုတ်ဖော်တင်ပြခြင်း နှင့်ပတ်သက်၍ ၂၀၁၉၊ ဇွန်လ (၂၉) ရက် Pre-Stakeholder Meeting၊ မေလ (၇)ရက် နှင့် ဇွန် (၄)ရက်အတွင်း Key Informant Interview များပြုလုပ်ခဲ့ ကြောင်း၊ ဆွေးနွေးပွဲအတွင်း ဆွေးနွေးညှိနှိုင်းမှုများ၊ မေးမြန်း ဖြေကြားချက်များကို ဖော်ပြထားကြောင်း၊
- (ဆ) Conclusion and Recommendations ကိုဖော်ပြထားကြောင်း၊
- (ဇ) Scoping result ကို အခြေခံထားသော EIA Stage တွင် ဆန်းစစ်မည့် အချက် အလက်များကို ဖော်ပြထားကြောင်း၊

၄။ De Heus Myanmar Co., Ltd ၏ ရေသတ္တဝါ အစားအစာထုတ်လုပ်ခြင်းနှင့် ဖြန့်ဖြူး ရောင်းချခြင်းလုပ်ငန်း (Aqua Feed Mill Factory Project) အတွက် တင်ပြလာသည့် နယ်ပယ် အတိုင်းသတ်မှတ်ခြင်းအစီရင်ခံစာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်းနှင့်ကိုက်ညီကြောင်းစိစစ်တွေ့ရှိရမှုအပေါ် ပြည်ထောင်စုဝန်ကြီးရုံးထံသို့ ရည်ညွှန်း(၂) ပါစာဖြင့် တင်ပြခဲ့ရာ လုပ်ထုံးလုပ်နည်းနှင့်အညီဆက်လက်ဆောင်ရွက်ရန် ရည်ညွှန်း (၃)ပါစာ ဖြင့် အကြောင်းကြားလာပါသည်။

၅။ သို့ဖြစ်ပါ၍ De Heus Myanmar Co., Ltd ၏ ရေသတ္တဝါ အစားအစာထုတ်လုပ်ခြင်းနှင့် ဖြန့်ဖြူးရောင်းချခြင်းလုပ်ငန်း (Aqua Feed Mill Factory Project)အတွက် တင်ပြလာသည့် တင်ပြလာသည့် နယ်ပယ်တိုင်းတာသတ်မှတ်ခြင်း အစီရင်ခံစာကို အတည်ပြုပါကြောင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ ပြင်ဆင်ရာ၌ အောက်ပါအချက်များကို ထည့်သွင်း ဆန်းစစ်ရန် လိုအပ်ပါကြောင်း ပြန်ကြားအပ်ပါသည်-

- (က) တင်ပြလာသောနယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်းအစီရင်ခံစာနှင့် ဆောင် ရွက်ရမည့်လုပ်ငန်းတာဝန်များ(Terms of Reference - TOR)ကို အခြေခံ၍ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းအစီရင်ခံစာအား ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်း အပိုဒ် (၅၅ မှ ၆၅ အထိ) ပါဖော်ပြချက်များ နှင့်အညီ ပြုစုရေးဆွဲတင်ပြရန်၊
- (ခ) Terms of Reference တွင် EIA အစီရင်ခံစာ၌ ပါဝင်ရမည့် အခန်းအလိုက် ဖော်ပြ ထားသော်လည်း ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် ၆၂ အရ စီမံကိန်းအဆိုပြုသူမှ လိုက်နာဆောင်ရွက်ရမည့် ကတိကဝတ်နှင့်



အစီရင်ခံစာ ရေးသားပြုစုသည့် တတိယအဖွဲ့အစည်းမှ လိုက်နာထားရှိသည့် ကတိကဝတ်များကို ထည့်သွင်းဖော်ပြရန်၊

- (ဂ) စီမံကိန်းလုပ်ငန်းစဉ်အဆင့်ဆင့်မှ ထွက်ရှိလာမည့် ထုတ်လွှတ်အခိုးအငွေ၊ စွန့်ပစ်ရေ/စွန့်ထုတ်ရေ၊ ဆူညံသံ၊ စွန့်ပစ်ပစ္စည်းတို့ကိုကားချပ်များ၊ အညွှန်းများနှင့်တကွ ဖော်ပြ၍စီမံခန့်ခွဲမှုနည်းလမ်းများ (Management Action) ကို အသေးစိတ် ထည့်သွင်းဖော်ပြရန်၊
- (ဃ) ထုတ်လုပ်မှုဒီဇိုင်း၊ ထုတ်လုပ်မှုနည်းပညာ၊ ရေအရင်းအမြစ်ရယူမှု၊ စွမ်းအင်ရယူသုံးစွဲမှုနည်းလမ်း၊ ကုန်ကြမ်းပစ္စည်းများရယူမှုတို့နှင့် စပ်လျဉ်း၍ အခြားနည်းရွေးချယ်မှုတို့ကို ပတ်ဝန်းကျင်နှင့်လူမှုရေးဆိုင်ရာ၊ စီးပွားရေးဆိုင်ရာ ထည့်သွင်းစဉ်းစားမှုများဖြင့်နှိုင်းယှဉ်ဖော်ပြပြီး အဆိုပြုစီမံကိန်းအတွက် ရွေးချယ်ထားသည့် အချက်အလက်များနှင့်တကွဆန်းစစ်ဖော်ပြရန်၊
- (င) Risk Assessment and Hazard Management ဆိုင်ရာများကို ဆန်းစစ် လေ့လာ၍ EIA အစီရင်ခံစာ ပြင်ဆင်သည့်အခါတွင် ထည့်သွင်းဖော်ပြသွားရန်၊
- (စ) စွန့်ပစ်အရည်စီမံခန့်ခွဲမှုနှင့်ပတ်သက်၍ Wastewater Treatment Unit တစ်ခု ထည့်သွင်းစဉ်းစားရန်၊
- (ဆ) လုပ်ငန်းခွင်ဘေးကင်းလုံခြုံရေးနှင့်ကျန်းမာရေးအများပြည်သူကျန်းမာရေးအတွက် စီမံချက်များကို ထည့်သွင်းဖော်ပြရန်၊
- (ဇ) စီမံကိန်းအတွက်လိုအပ်သော raw chemical များ၊ စက်ပစ္စည်းကိရိယာများ ဝယ်ယူရာတွင် Environmental Compliance ရှိသော ကုမ္ပဏီများထံမှ ဝယ်ယူတင်သွင်းရန်၊
- (ဈ) ဌာနဆိုင်ရာအဖွဲ့အစည်းများ၊ လွှတ်တော်ကိုယ်စားလှယ်များ၊ အစိုးရမဟုတ်သော အဖွဲ့အစည်းများ၊ မီဒီယာများ၊ ဒေသခံများ၊ စီမံကိန်းကြောင့် အဓိကထိခိုက်ခံစားရမည့်သူများ ပါဝင်လျက် တွေ့ဆုံဆွေးနွေးမှုများကို စီမံကိန်းဧရိယာ၏ အနီးဝန်းကျင်၊ စီမံကိန်းလုပ်ငန်းနှင့် ဆက်စပ်လျက်ရှိသော ကျေးရွာများ၊ မြို့နယ်များတွင် ထပ်မံဆောင်ရွက်ရန်နှင့်စီမံကိန်းဆိုင်ရာ updated information များကို တင်ပြဆွေးနွေးညှိနှိုင်းရန်၊ ၎င်းတို့၏အကြံပြုချက်နှင့်လိုလားချက်များအား အလေးထားပေါင်းစပ်ဆောင်ရွက်ရန်၊
- (ည) စီမံကိန်းလုပ်ငန်းဆောင်ရွက်စဉ်အတွင်း မကျေနပ်မှုများရှိလာပါက ဖြေရှင်းဆောင်ရွက်ပေးမည့်အစီအစဉ် (Grievance Redress Mechanism) ကို အကောင်အထည်ဖော်ဆောင်ရွက်သွားရန်၊

- (ဋ) နယ်ပယ်အတိုင်းအတာ သတ်မှတ်ခြင်းနှင့် ဆောင်ရွက်ရမည့် လုပ်ငန်းတာဝန်များ တွင်ထည့်သွင်းဖော်ပြထားသည့်အချက်များအပြင် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆောင်ရွက်ပြီးနောက်အကယ်၍ပြင်ဆင်ဖြည့်စွက်ရန်လိုအပ်သောအချက်များ ရှိပါကထပ်မံလေ့လာဆန်းစစ်ခြင်း ဆောင်ရွက်ရန်၊

*Handwritten signature in blue ink*

(လှမောင်သိန်း)

ညွှန်ကြားရေးမှူးချုပ်  
*Handwritten signature in blue ink*

မိတ္တူကို

ပြည်ထောင်စုဝန်ကြီးရုံး၊ သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊

ရုံးအမှတ် (၂၈)

ညွှန်ကြားရေးမှူး၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ ရန်ကုန်တိုင်းဒေသကြီး

ရုံးလက်ခံ၊ မျှောစာတွဲ

## **APPENDIX – G**



# **DE HEUS MYANMAR LTD.**

## **ENVIRONMENTAL QUALITY MONITORING REPORT**

23<sup>rd</sup> November, 2021

**Prepared by**



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# CHAPTER 1

## ENVIRONMENTAL QUALITY MONITORING REPORT

### 1.1. INTRODUCTION

Environmental quality monitoring was conducted by Hexagonal Angle Consulting Team at **De Heus Myanmar Aqua Feed Factory** on 10<sup>th</sup> November, 2021 which is located at Myaung Dagar Industrial Zone, Hmawbi Township, Yangon. The environmental quality monitoring includes outdoor air quality measurement, temperature, humidity, noise measurement and water quality testing. During that day, the average temperature was 30.75°C and humidity was 70.85%.

Outdoor air quality, temperature and humidity are measured by using the OCEANUS-AQM09 device. Noise measurement is used by the Digital Sound Level Meter (GM-1356). The detailed information of the outdoor air quality measurement devices is mentioned in the **APPENDIX- C**.

#### 1.1.1. Overview of the Project Area

The project site is located in Plot No. 309, 310 & 311, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region. The factory is located in North latitudes 17° 9' 25.19" and East longitudes 95° 58' 7.87". Location map of the project area is as shown in Figure 1-1.

Since the project factory is located at the Myaung Dagar Industrial Zone and, its neighborhood is bordered by other factories and undeveloped areas and factories around the project area.



Figure 1-1 Overview Map of the Project Area



## 1.2. BASELINE ENVIRONMENTAL QUALITY

### 1.2.1. Outdoor Air Quality

Air quality measurement was conducted at the project area in 10<sup>th</sup> November 2021. The OCEANUS-AQM09 was used for air monitoring survey.

The measurement station is located at the project area and monitoring point is located between two production factories of De Heus Myanmar (one is for De Heus Animal Feed factory and another one is De Heus Myanmar Aqua Feed factory). The proposed monitoring factory is De Heus Myanmar Aqua Feed factory. The measurement station for air quality is as displayed in Figure 1-2 and the measurement photos are shown in Figure 1-3 respectively.



**Figure 1-2 Outdoor Air Quality Measurement Location (24 Hours Measurement)**



The OCEANUS-AQM09



Air Quality Measurement

**Figure 1-3 Air Quality Monitoring (10<sup>th</sup> November 2021)**

The emission of harmful gaseous pollutants in the atmosphere is a major health issue. The operation processes of animal feed factory will generate the different kinds of air pollution, depending upon the type of technology and operation procedures of the factory. HA's Environmental Team conducted the outdoor air quality measurements such as particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), gas (NO<sub>2</sub>, CO, SO<sub>2</sub>, O<sub>3</sub>), total suspended particulate (TSP), relative humidity, air pressure, temperature, etc. during the field survey on November 10th, 2021, as displayed in Figure 1-3. These measurements were made in accordance with the guidelines of National Environmental Quality (Emission) Guidelines in the project site area. Both results of the study and guidelines are as shown in Table 1-1.

According to the result, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) are above the standard guidelines (Analyzed Graph is shown in Figure 1-4 ). Moreover, parameter as Sulphur Dioxide (SO<sub>2</sub>) is above the guidelines (Analyzed Graph is shown in Figure 1-5) but the parameters of Nitrogen Dioxide (NO<sub>2</sub>), Carbon Monoxide (CO), and Ozone (O<sub>3</sub>), 42.58 µg/m<sup>3</sup>, 0.3 ppm, 43.24 µg/m<sup>3</sup> respectively are compliance with the standard guidelines.

According to the analyzed data, PM<sub>10</sub> and PM<sub>2.5</sub> exceed the guideline between 5:00 AM and 7:00 AM, 6:00 PM and 7:00 PM, and SO<sub>2</sub> exceeds the guidelines between 7:00 AM and 8:00 AM, and

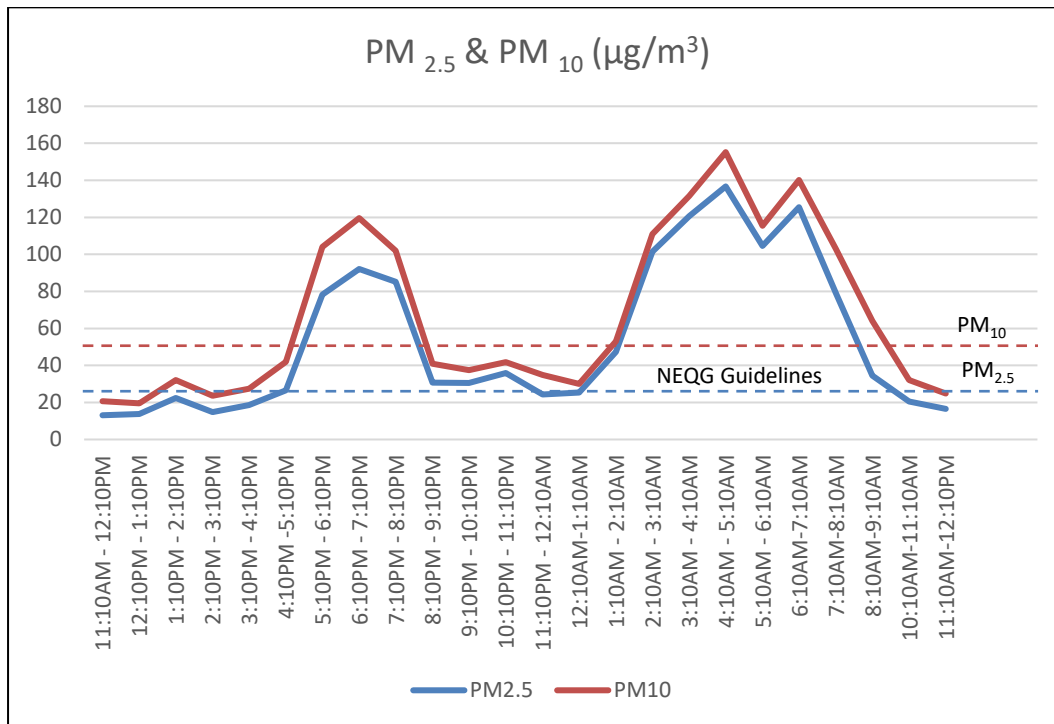
1:00 PM and 2:00 PM, respectively. These exceeded results in atmosphere are caused by the burning of fossil fuels. Therefore, there will need to check and mitigate the fossil fuel usage in all operation area of proposed factory.

**Table 1-1 Results of the Ambient Air Monitoring Measurement**

No.	Parameter	Analyzed Period	Result	Unit	Average Period		WHO Guideline Value	NEQG* Guideline Value	Remark
1	Particulate Matter PM <sub>10</sub>	24-hr	66.92	µg/m <sup>3</sup> µg/m <sup>3</sup>	1 24	Year Hour	-	*20 µg/m <sup>3</sup> *50 µg/m <sup>3</sup>	Above the guideline
2	Particulate Matter PM <sub>2.5</sub>	24-hr	54.11	µg/m <sup>3</sup> µg/m <sup>3</sup>	1 24	Year Hour	25 µg/m <sup>3</sup>	*10 µg/m <sup>3</sup> *25 µg/m <sup>3</sup>	Above the guideline
3	Total Suspended Particulate (TSP)	24-hr	92.3	µg/m <sup>3</sup>	24 Hours		NG	NG	-
4	Sulphur Dioxide (SO <sub>2</sub> )	24-hr	118.84	µg/m <sup>3</sup> µg/m <sup>3</sup>	10 24	Mins Hours	8 ppb	* 500 µg/m <sup>3</sup> * 20 µg/m <sup>3</sup>	Above the guideline
5	Nitrogen Dioxide (NO <sub>2</sub> )	1-hr	42.58	µg/m <sup>3</sup> µg/m <sup>3</sup>	1 1	Year Hour	21 ppb	*40 µg/m <sup>3</sup> *200 µg/m <sup>3</sup>	Under the guideline
6	Carbon Monoxide (CO)	24-hr	0.3	ppm	24 Hours		9 ppm	*150 µg/m <sup>3</sup>	Under the guideline
7	Ozone (O <sub>3</sub> )	8-hr	43.24	µg/m <sup>3</sup>	8 Hours		NG	100 µg/m <sup>3</sup>	Under the guideline
8	Relative Humidity	24-hr	70.85	%	24 Hours		NG	NG	-
9	Temperature	24-hr	30.75	°C	24 Hours		NG	NG	-
10	Air Pressure	24-hr	1011.66	hPa	24 Hours		NG	NG	-
11	Wind Direction	24-hr	204.83	degree	24 Hours		NG	NG	-
12	Wind Speed	24-hr	0.48	m/s	24 Hours		NG	NG	-

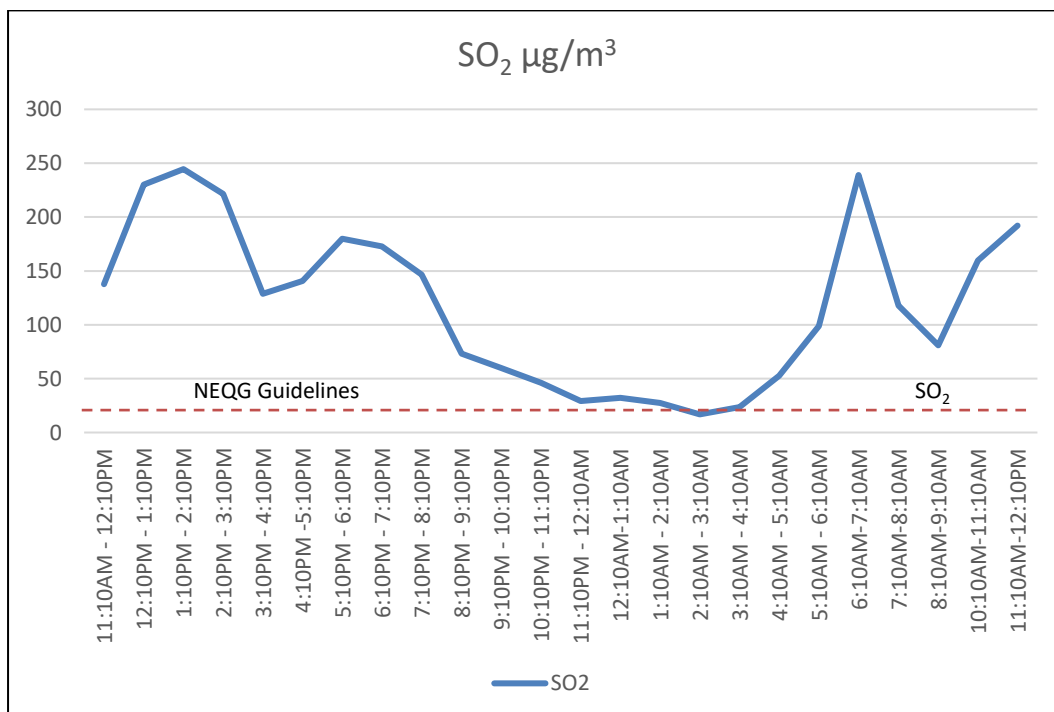
\*National Environmental Quality (Emission) Guidelines (2015)

NG=No Guideline



**Figure 1-4 Graph for PM<sub>10</sub> and PM<sub>2.5</sub> Emission**

Remark: PM<sub>10</sub> and PM<sub>2.5</sub> are exceeding above the guidelines due to burning of fossil fuels in operation area. Regular checkups and maintenance on all vehicles with fossil fuel usage are needed.



**Figure 1-5 Graph for SO<sub>2</sub> Emission**

Remark: SO<sub>2</sub> is exceeding above the guidelines due to burning of fossil fuels in operation area. Regular checkups and maintenance on all vehicles with fossil fuel usage are needed.

### 1.2.2. Noise

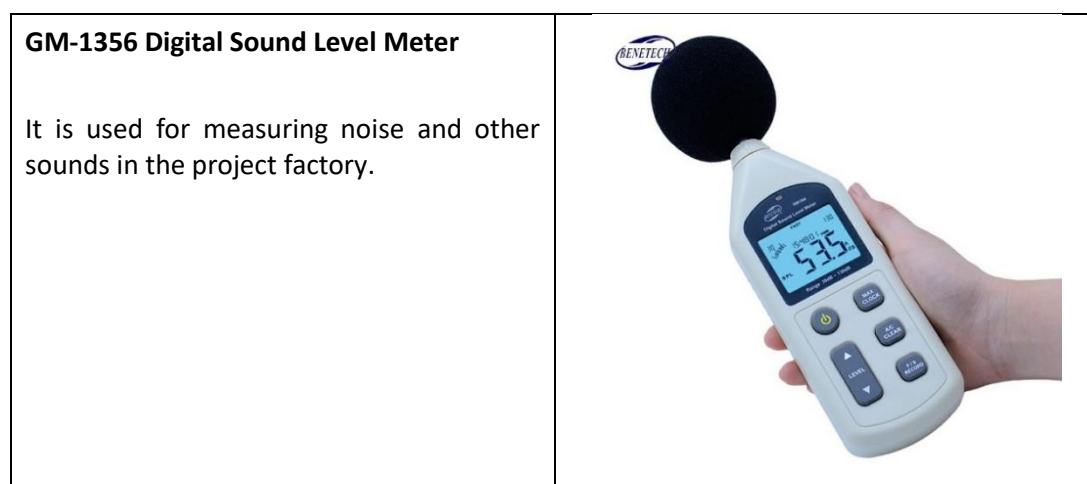
WHO has described noise pollution as an underestimated threat that can cause hearing loss, cardiovascular problems, cognitive impairment, stress and suffering from depression. Noise pollution can affect people in several ways, some of which includes cardiovascular diseases and sleep disturbances. MONREC (Ministry of Natural Resources and Environmental Conservation) has issued National Environmental Quality (Emission) Guidelines to provide the basis for regulations and control of noise level. Noise impacts should not exceed the levels presented in Table 1-2.

**Table 1-2 Noise Level Standard**

Receptor	One Hour LAeq (dBA) <sup>a</sup>	
	Daytime 07:00-22:00 (10:00-22:00 for Public holidays)	Nighttime 22:00 – 07:00 (22:00 – 10:00 for Public Holidays)
Residential, Institutional, educational	55	45
Industrial, commercial	70	70

<sup>a</sup> Equivalent continuous sound level in decibels

A reconnaissance survey of noise level measurements was made in the De Heus Myanmar Aqua Feed factory in order to ensure and protect from the hazardous work environment. The data were collected on 10<sup>th</sup> November 2021. Noise measurements are needed to make in the factory as it helps in identifying work locations where there are noise problems, employees who may be affected, and in checking the compliance with noise regulations, noise control and community annoyance. It is also important to determine that if noise is a potential problem in the workplace. Equipment that is used to measure ambient noise measurement is as shown below in Figure 1-6. The stations which were made noise measurements are shown in Figure 1-7.



**Figure 1-6 Equipment Used to Measure Noise Levels**





**Figure 1-7 Noise Quality Measurement Point (24 Hours Measurement)**

The measurements of noise quality were made between two production factories of De Heus Myanmar at the same time with the outdoor air monitoring. Therefore, the measurement was made to know the noise pollution in the compound of the factory.

In measuring noise measurement, it is noted that minimum noise level is 60.2 dBA and 82.2 dBA at the maximum. There is no heavy activity in the measuring area, except the boiler is operating at the distance at that time for the operation process of the factory and the average noise level is 66.19 dBA. Thus, the measurement was relevant to the standard noise level. The noise measurement result graph and the photo that made in the field visit are shown in Figure 1-8, Figure 1-9, and the results are in Table 1-4 and Table 1-4 respectively.

According to the noise measurement results, although the average noise result is not exceeding the guidelines, the maximum dBA (82.2) is above the guidelines. It would be caused by the boiler uses in operation are. There will need to check the vehicles and equipment of all operation works.

**Table 1-3 Noise Results in One Hour Time Interval**

No.	Time Interval		Analyzed Period	Average Value	Unit
1	10:10	11:10	1hr	66.35	dBA
2	11:10	12:10	1hr	62.8	dBA
3	12:10	13:10	1hr	65.08	dBA
4	13:10	14:10	1hr	66.5	dBA



No.	Time Interval		Analyzed Period	Average Value	Unit
5	14:10	15:10	1hr	64.99	dBA
6	15:10	16:10	1hr	63.88	dBA
7	17:10	18:10	1hr	63.25	dBA
8	18:10	19:10	1hr	64.87	dBA
9	19:10	20:10	1hr	65.95	dBA
10	20:10	21:10	1hr	66.57	dBA
11	21:10	22:10	1hr	65.87	dBA
12	22:10	23:10	1hr	68.18	dBA
13	23:10	00:10	1hr	66.58	dBA
14	00:10	1:10	1hr	65	dBA
15	1:10	2:10	1hr	66	dBA
16	2:10	3:10	1hr	66.22	dBA
17	3:10	4:10	1hr	74.53	dBA
18	4:10	5: 10	1hr	69.6	dBA
19	5:10	6:10	1hr	66.54	dBA
20	6:10	7:10	1hr	67.43	dBA
21	7:10	8:10	1hr	66.35	dBA
22	8:10	9:10	1hr	67.51	dBA
23	9:10	10:10	1hr	62.14	dBA
24	10:10	11:10	1hr	64.82	dBA

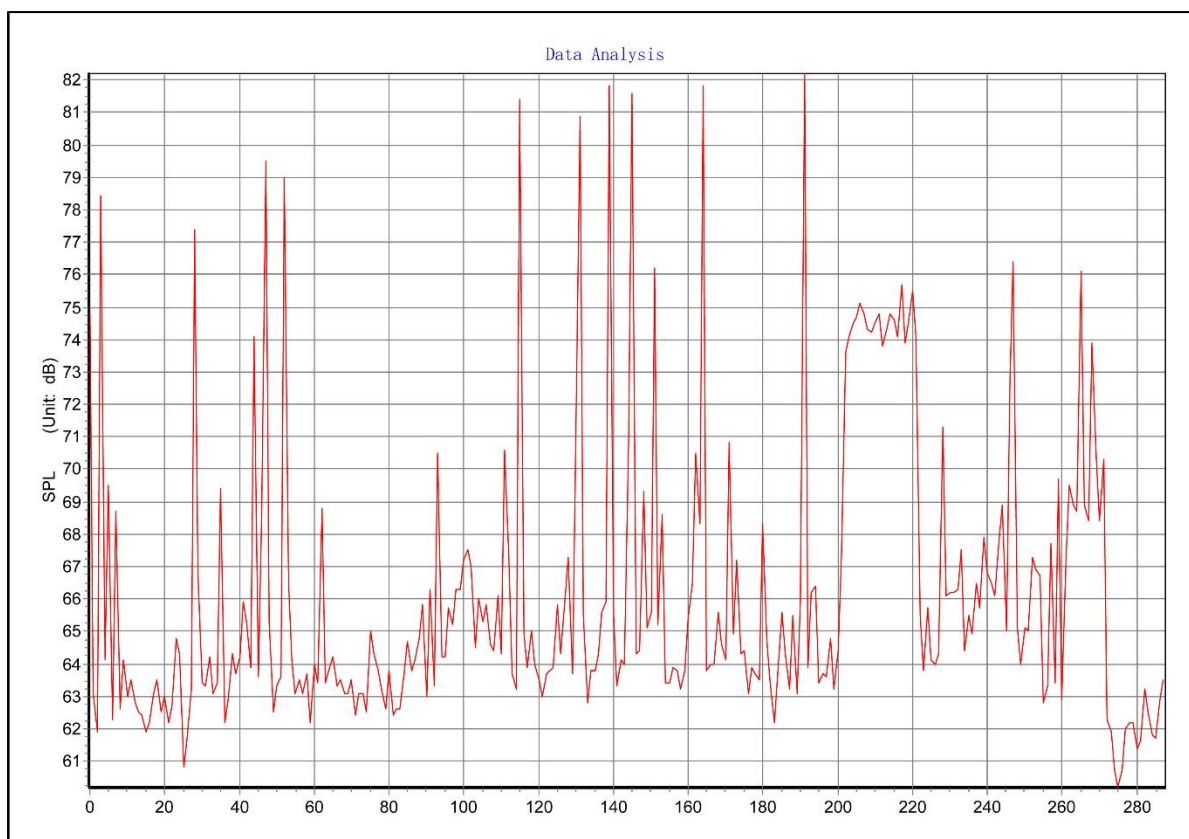
**Table 1-4 Average Monitoring Measurement of Noise (dBA) within 24 Hours**

No.	Measurement Place	Current activity during monitoring	Noise Level (dBA)			NEQG1 standard	
			Day Time			Residential, Institutional, educational	Industrial, commercial
			Minimum dBA	Maximum dBA	Average dBA		
1	Area between the two production factories	Boiler is operating at the distance	60.2	82.2	66.19	55	70

<sup>1</sup>National Environmental Quality (Emission) Guidelines, 29 Dec 2016

\*Average equivalent for one hour

\*\*Average maximum for one hour



**Figure 1-8 Noise Level Graph of the Factory**



**Noise Level Monitoring**

**Figure 1-9 Noise Level Measurement in the Factory**

### 1.2.3. Water Quality

The water sample was collected from drinking water bottles for workers, shown in Figure 1-10. The process was conducted on 10<sup>th</sup> November 2021 then sent to the laboratory. As the result, pH level of water is within the WHO standard guideline (2018) and the other parameters such as Chloride, Conductivity, Manganese, Sulfate and other parameters are under the guideline. Water sample collection map of De Heus Myanmar Ltd. is shown in Figure 1-10. The result of water sample is as shown in Table 1-6 and original laboratory test result is attached in **Appendix B**.



**Figure 1-10 Water Sample Collected from Drinking Water Pipe**

**Table 1-5 Location of Water Quality Collection**

Project Name	Water Quality Measurement GPS Location	Date
De Heus Myanmar Ltd	17° 9' 24.84"N 95° 58' 6.69"E	10 <sup>th</sup> November 2021



**Figure 1-11 Location of Water Sample Collection**

**Table 1-6 Domestic Water Quality Result**

No.	Parameter	Result	Unit	Method	WHO Guideline Value	Remark
1	Ammonia	1.42	mg/L	Nessler Method	NA	-
2	Arsenic	Nil	mg/L	Hach Test Kits	0.01mg/L	-
3	Calcium	0.80	mg/L	EDTA Titrimetric Method	150mg/L	Under the Guideline
4	Chloride	4.96	mg/L	Argentometric Method	250 mg/L	Under the Guideline
5	Color	Nil	PUC	Hanna (HI 97727) Color of water Photometer	15 PCU	-
6	Conductivity	42	μS/cm	Hanna (HI 991300) pH, EC, TDS, and Temperature Meter	2500 μS/cm	Under the Guideline
7	Dissolved Oxygen	5.17	mg/L	Hanna (HI 98193) DO and BOD meter	6mg/L	Under the guideline
8	Magnesium	0.49	mg/L	EDTA Titrimetric Method	100 mg/L	Under the guideline
9	Manganese	<0.006	mg/L	1-(2 – Pyridylazo) – 2 – Naphol (PAN) Method	0.4 mg/L	Under the guideline
10	pH	6.53	-	Hanna (HI 2211) – pH & Temperature Meter	6.5 – 8.5	Within the Guideline
11	Salinity	8.96	mg/L	Argentometric Method	NA	-
12	Sulfate	<2	mg/L	USEPA SulfaVer 4 Method	250 mg/L	Under the guideline
13	Temperature	24.8	°C	Hanna (HI 2211) – pH & Temperature Meter	25°C	-

No.	Parameter	Result	Unit	Method	WHO Guideline Value	Remark
14	Total Dissolved Solids	28	ppm	Hanna (HI 991 300) – pH, EC, TDS, and Temperature Meter	1000mg/L	Under the guideline
15	Total Hardness	4.00	mg/L	EDTA Titrimetric Method	500 mg/L	Under the guideline
16	Turbidity	Nil	NTU	Milwaukee (MI 415) – Turbidity Meter	5 NTU	-

\*WHO Guideline Value

NA=Not Available

**Appendix A**  
**Air Quality Results**





**Air Quality Sampling Result (လေအရည်အသွေးတိုင်းတာမှုရလဒ်)**

No. (စဉ်)	Parameter (အရည်အသွေး)	Recorded Period	Result (ရလဒ်)	Unit (ယူနစ်)	Average Period (ပျမ်းမျှကာလ)		*Guideline Value (ထုတ်လွှတ်မှုစံနှုန်း)	Remark
1	Particulate Matter PM <sub>10</sub>	24-hr	66.92	μg/m <sup>3</sup> μg/m <sup>3</sup>	1 24	Year Hour	*20 μg/m <sup>3</sup> *50 μg/m <sup>3</sup>	Above the guideline
2	Particulate Matter PM <sub>2.5</sub>	24-hr	54.11	μg/m <sup>3</sup> μg/m <sup>3</sup>	1 24	Year Hour	*10 μg/m <sup>3</sup> *25 μg/m <sup>3</sup>	Above the guideline
3	Total Suspended Particulate (TSP)	24-hr	92.3	μg/m <sup>3</sup>	24 Hours		NG	-
4	Sulphur Dioxide (SO <sub>2</sub> ) ဆာလဖာဒိုင်အောက်ဆိုဒ်	24-hr	118.84	μg/m <sup>3</sup> μg/m <sup>3</sup>	10 24	Mins Hours	* 500 μg/m <sup>3</sup> * 20 μg/m <sup>3</sup>	Above the guideline
5	Nitrogen Dioxide (NO <sub>2</sub> ) နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ်	1-hr	42.58	μg/m <sup>3</sup> μg/m <sup>3</sup>	1 1	Year Hour	*40 μg/m <sup>3</sup> *200 μg/m <sup>3</sup>	Under the guideline
6	Carbon Monoxide (CO) ကာဗွန်မိုနောက်ဆိုဒ်	24-hr	0.3	ppm	24 Hours		NG	Under the guideline
7	Air Pressure	24-hr	1011.66	hPa	24 Hours		NG	-
8	Ozone (O <sub>3</sub> )	8-hr	43.24	μg/m <sup>3</sup>	8 Hours		100	Under the guideline
9	Relative Humidity စိုထိုင်းဆ	24-hr	70.85	%	24 Hours		NG	-
10	Temperature အပူချိန်	24-hr	30.75	Degree Celsius	24 Hours		NG	-
11	Wind Direction	24-hr	204.83	Degree	24 Hours		NG	-
12	Wind Speed	24-hr	0.48	m/s	24 Hours		NG	-

\*National Environmental Quality (Emission) Guideline 2015

NG=No Guideline

Analyzed by

Kyaw Thet

Environmentalist

Hexagonal Angle International Consultants Co., Ltd.

Checked by

Ei Ei Zaw

General Manager (Environmental & Social Specialist)

Hexagonal Angle International Consultants Co., Ltd.

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**Appendix B**  
**Water Quality Sampling Results**



### LABORATORY ANALYSIS REPORT

- 1 Client Name : De Heus Myanmar Limited
- 2 Location : Plot No.309, 310 & 311, Myaung Dagar Industrial Zone, Hmawbi
- 3 Type of Sample : Drinking Water
- 4 Sample No. : 00403/2021
- 5 Contact Person : Ko Win Naing Oo
- 6 Phone No. : 09-255896108
- 7 Date Received : 10.11.2021
- 8 Date of Test Performed : 10.11.2021
- 9 Date of Issued : 12.11.2021
- 10 Result :

No.	Parameter	Result	Unit	WHO STD 2018	Method
1	Ammonia	1.42	mg/L	NA	Nessler Method
2	Arsenic	Nil	mg/L	0.01 mg/L	Hach Test Kits
3	Calcium	0.80	mg/L	150 mg/L	EDTA Titrimetric Method
4	Chloride	4.96	mg/L	250 mg/L	Argentometric Method
5	Color	Nil	PCU	15 PCU	Hanna (HI 97727) - Color of water Photometer
6	Conductivity	42	μS/cm	2500 μS/cm	Hanna (HI 991300) - pH, EC, TDS and Temperature Meter
7	Dissolved Oxygen	5.17	mg/L	6 mg/L	Hanna (HI 98193) - DO and BOD meter
8	Magnesium	0.49	mg/L	100 mg/L	EDTA Titrimetric Method
9	Manganese	< 0.006	mg/L	0.4 mg/L	1 - (2 - Pyridylazo) - 2 - Naphthol (PAN) Method
10	pH	6.53	-	6.5-8.5	Hanna (HI 2211) - pH & Temperature Meter
11	Salinity	8.96	mg/L	NA	Argentometric Method
12	Sulfate	< 2	mg/L	250 mg/L	USEPA SulfaVer 4 Method
13	Temperature	24.8	° C	25 ° C	Hanna (HI 2211) - pH & Temperature Meter



**LABORATORY ANALYSIS REPORT**

- 1 Client Name : De Heus Myanmar Limited
- 2 Location : Plot No.309, 310 & 311, Myaung Dagar Industrial Zone, Hmawbi
- 3 Type of Sample : Drinking Water
- 4 Sample No. : 00403/2021
- 5 Contact Person : Ko Win Naing Oo
- 6 Phone No. : 09-255896108
- 7 Date Received : 10.11.2021
- 8 Date of Test Performed : 10.11.2021
- 9 Date of Issued : 12.11.2021
- 10 Result :

No.	Parameter	Result	Unit	WHO STD 2018	Method
14	Total Dissolved Solids	28	ppm	1000 mg/L	Hanna (HI 991300) - pH, EC, TDS and Temperature Meter
15	Total Hardness	4.00	mg/L	500 mg/L	EDTA Titrimetric Method
16	Turbidity	Nil	NTU	5 NTU	Milwaukee (MI 415) - Turbidity Meter

**Remark:**

This certificate is issued only for the receipt of the test sample.

**Tested By**

Name : HTET HTET KYAW

Position : Laboratory Technician

Signature : .....

**Approved By**

Name : MAY THU ZAW MYINT

Position : Chief Technical Officer

Signature : .....



**Appendix C**  
**Calibration Report of OCEANUS-AQM09**

## Calibrate report

Product	Air Quality Monitor System	Model	AQM-09
Quantity	1pcs	Cali date	JUNE , 24 , 2020
Product No.	OC20200624484529		
Appearance	<input checked="" type="checkbox"/> Clean <input checked="" type="checkbox"/> Non corrosive <input checked="" type="checkbox"/> No damage		
Gas type	O <sub>3</sub> :ppb   NO <sub>2</sub> :ppb   SO <sub>2</sub> :ppb   CO: ppm PM10:ug/m <sup>3</sup> PM2.5:ug/m <sup>3</sup> TSP:ug/m <sup>3</sup> Atmospheric : hpa   Wind veloci: m/s   Wind direct: Temperature and humidity: °C/%RH		
Accuracy	± 3%F.S		
resolution	1 ppb   0.1ppm		
Response time	≤30S		
Survey range	O <sub>3</sub> :0-2000ppb   NO <sub>2</sub> :0-2000ppb   SO <sub>2</sub> :0-2000ppb   CO:0-200ppm PM2.5:0-1000ug/m <sup>3</sup> PM10:0-1000ug/m <sup>3</sup> TSP:0-1000ug/m <sup>3</sup> Atmospheric:600-1100hpa   Windveloci:0-60m/s   Winddirect:0-360° Temperature: -20-50°C , Humidity:0-100%RH		
Signal output mode	4G LTE		
Power supply voltage	AC 220V/50Hz		
Power dissipation	≤ 30W		
Working temperature and humidity range	-20°C-50°C / 5%RH-95%RH		
Testing condition indoor	Temperature: 30°C   Humidity: 60%RH		
Calibration gas	O <sub>3</sub> NO <sub>2</sub> SO <sub>2</sub> CO		
Cali gas test	1. O <sub>3</sub> : Cali gas concentration: <u>2000ppb</u> Inspect concentration: <u>1992</u> ppb 2. NO <sub>2</sub> : Cali gas concentration: <u>1260ppb</u> Inspect concentration: <u>1262</u> ppb 3. SO <sub>2</sub> : Cali gas concentration: <u>1200ppb</u> Inspect concentration: <u>1201</u> ppb 4. CO: Cali gas concentration: <u>100ppm</u> Inspect concentration: <u>97.8</u> ppm 5. PM2.5:Measured value: <u>37</u> ug/m <sup>3</sup> PM10:Measured value: <u>45</u> ug/m <sup>3</sup> TSP:Measured value: <u>73</u> ug/m <sup>3</sup> 6. Atmospheric:Measured value <u>1000</u> hpa 7. Wind veloci:Measured value: <u>0</u> Wind direct:Measured value : <u>0K</u> 8. Temperature: Measured value: <u>28.07</u> Humidity:Measured value: <u>48.24</u>		
Test result	Qualified		
Remark			

Check:



Approval:



Tester:



Company: Henan Oceanus Import &amp; Export Co., Ltd.

Date: JUNE , 24 , 2020

 Email: [info@china-oceanus.com](mailto:info@china-oceanus.com)

Telephone: +86-0371-6099-8169

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# **DE HEUS MYANMAR LTD.**

## **LIGHT QUALITY MONITROING REPORT**

12<sup>th</sup> January, 2022

**Prepared by**



**HEXAGONAL ANGLE INTERNATIONAL CONSULTANTS CO., LTD.**

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Website: [www.hexagonalangle.com](http://www.hexagonalangle.com)

# Light Analysis Report

Date: 12<sup>th</sup> January 2022

## 1. INTRODUCTION

Light measurement was conducted by Hexagonal Angle Consulting Team at De Heus Myanmar Aqua Feed Factory on 7<sup>th</sup> January 2022 which is located at Myaung Dagar Industrial Zone, Hmawbi Township, Yangon. The light measurement was carried out in a total of 10 places, which mainly includes the Boiler outlet, control room, and Warehouse (Finishing Products).

The project site is located in Plot No. 309, 310 & 311, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region. The project area is located in North latitudes 17° 9' 25.19" and East longitudes 95° 58' 7.87". The location map of the project area is shown in Figure 1. Since the project factory is located at the Myaung Dagar Industrial Zone and, its neighborhood is bordered by other factories and undeveloped areas and factories around the project area.

Light measurement was carried out by using the Smart Sensor AS-823. The detailed information of the measurement device is mentioned in the **APPENDIX**.



Figure 1 Location Map of Project Area

## 2. METHODOLOGY

The workplace environment comprises an important aspect of an individual's overall wellbeing. Good lighting in the workplace can promote a reduced risk of occupational accidents, health problems, better concentration, and accuracy in work. Activities of the workers in the De Heus Myanmar Aqua Feed Factory are highly dependent on the quality of light for better visibility and work performance. Improper light levels can affect productivity and health negatively. Therefore, the study team performed light measurement in the De Heus Myanmar Aqua Feed Factory on the 7<sup>th</sup> January 2022 site visit.

To reveal the existing status of baseline light measurement, the average light measurement results were compared with Light Measurement Index Guidelines by **GENERAL EHS GUIDELINES: OCCUPATIONAL HEALTH AND SAFETY**. The equipment used to measure light measurement is as shown in below Figure 2.

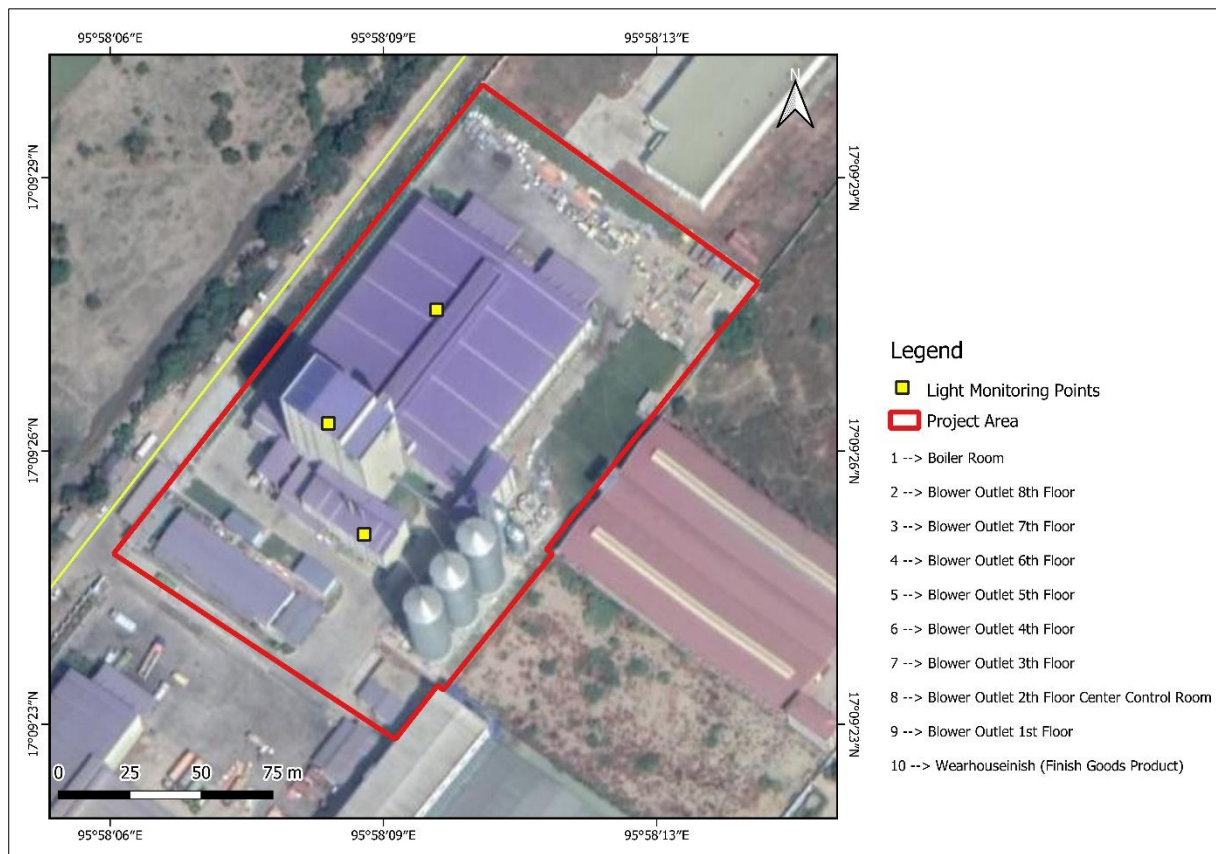


Figure 2 Smart Sensor AS-823

### 3. LIGHT MEASUREMENT INFORMATION

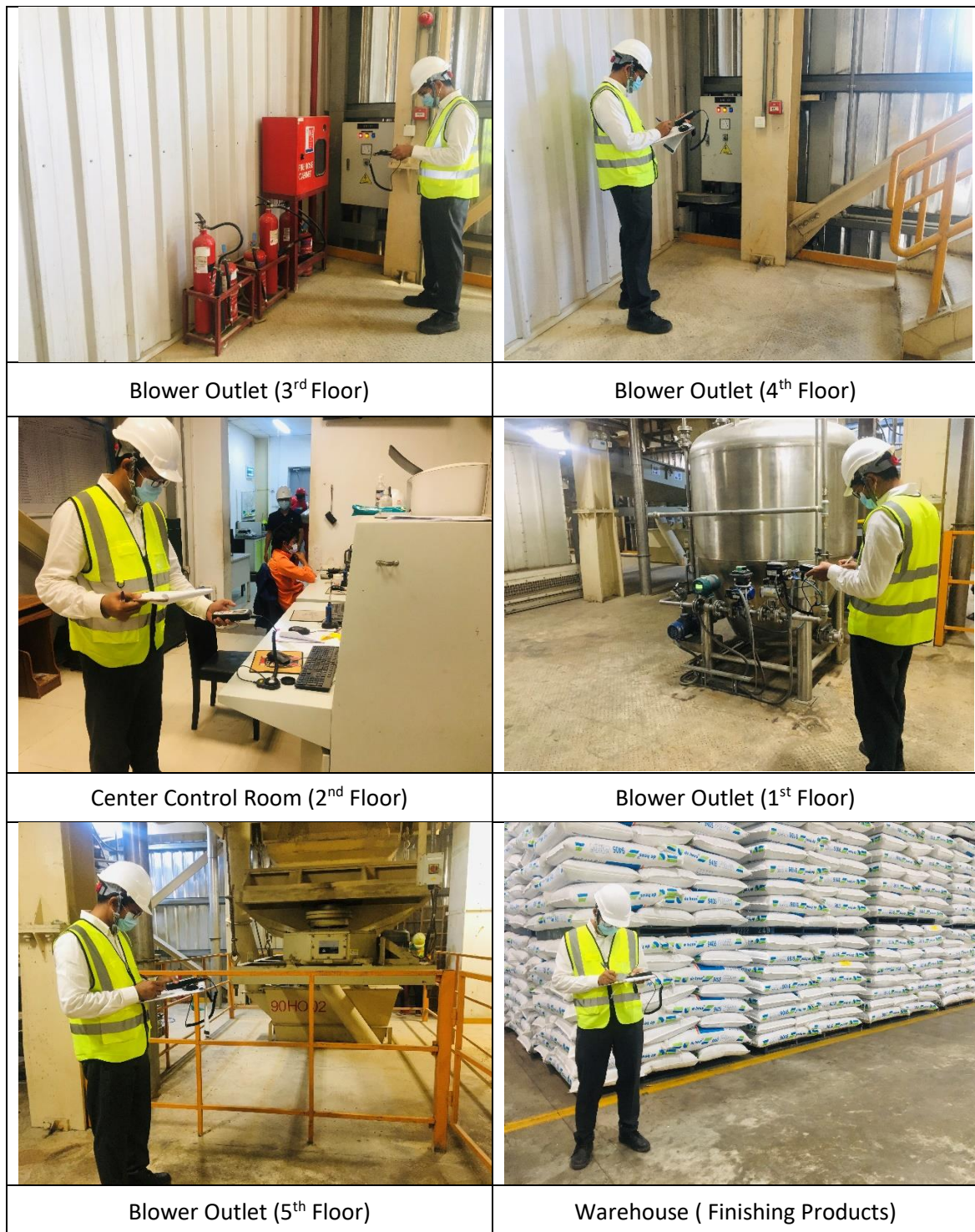
Item	Information		
Client	De Heus Myanmar Aqua Feed Factory		
Date	7 <sup>th</sup> January 2022		
Location	Plot No. 309, 310 & 311, Myaung Dagar Industrial Zone		
Township	Hmawbi Township		
State/Region	Yangon Region		
GPS Point	Latitude	17° 9' 25.19"N	
	Longitude	95° 58' 7.87" E	
Logging Duration (Hours)	Log on Time (Date, Time)	7.1.2022	10:00 AM
	Log off Time (Date, Time)	7.1.2022	11:00 AM
Light Monitoring Equipment	Smart Sensor AS-823		

The locations where light measurement was carried out and photos were taken during the field survey are as described below Figure 3 and Figure 4.





**Figure 3      Light Measurement Location Points**



**Figure 4      Photos taken during Light Measurement Field Survey**

#### 4. GENERAL EHS GUIDELINES: OCCUPATIONAL HEALTH AND SAFETY<sup>1</sup>

Location/Activity	Light Intensity (Lux)
Emergency Light	10
Out Door Non-Working Area	20
Simple orientation and temporary visits (machine storage, garage, warehouse)	50
Workspace with occasional visual tasks only (Corridors, stairways, lobby, elevator, auditorium, etc.)	100
Medium precision work (simple assembly, rough machine works, welding, packing, etc.)	200
Precision work (reading, moderately difficult assembly, sorting, checking, medium bench and machine works, etc.), offices.	500
High precision work (difficult assembly, sewing, color inspection, fine sorting etc.)	1000-3000

#### 5. LIGHT QUALITY SAMPLING RESULT

No.	Location	Activities	Time	Result (LUX)	Standard EHS Guideline	Remark
1.	Boiler Room (Computer Table)	Operation	10:00-10:31	315.5	200-500	Good
2.	Blower Outlet (8 <sup>th</sup> Floor)	Operation	10:06-10:41	162.5	100	Good
3.	Blower Outlet (7 <sup>th</sup> Floor)	Operation	10:08-10:43	110	100	Good
4.	Blower Outlet (6 <sup>th</sup> Floor)	Operation	10:11-10:46	100	100	Good
5.	Blower Outlet (5 <sup>th</sup> Floor)	Operation	10:15-10:48	154	100	Good
6.	Blower Outlet (4 <sup>th</sup> Floor)	Operation	10:17-10:50	135	100	Good
7.	Blower Outlet (3 <sup>rd</sup> Floor)	Operation	10:20-10:52	104	100	Good
8.	Centre Control Room (2 <sup>nd</sup> Floor)	Operation	10:22-10:53	353	200-500	Good
9.	Blower Outlet (1 <sup>st</sup> Floor)	Operation	10:24-10:55	202.5	100	Good

<sup>1</sup> World Bank Group and IFC. (April 30, 2007)



No.	Location	Activities	Time	Result (LUX)	Standard EHS Guideline	Remark
10.	Warehouse (Finishing Products)	Operation	10:28-10:58	540	50	Good

Analyzed by



Than Htike Zaw  
Environmental Engineer

Hexagonal Angle International Consultants Co., Ltd.

Checked by



Ei Ei Zaw

General Manager (Environmental & Social  
Specialist)

Hexagonal Angle International Consultants Co., Ltd.

## 6. Conclusion and Suggestions

The project site is located in Plot No. 309, 310 & 311, Myaung Dagar Industrial Zone, Hmawbi Township, Yangon Region. Light measurement was conducted by Hexagonal Angle Consulting Team at De Heus Myanmar Aqua Feed Factory on 7<sup>th</sup> January 2022 using the Smart Sensor AS-823. The location points are measured 2 times with 30mins interval between each measurement. The results are recorded and analyzed according to **GENERAL EHS GUIDELINES: OCCUPATIONAL HEALTH AND SAFETY**. According to the results, the current condition is in a good condition.

As stated in General EHS Guidelines by International Finance Corporation (World Bank Group) on 30<sup>th</sup> April 2007, the minimum limits of illumination intensity for precision work such as production and packing are required to have 500 Lux at least. Simple orientation and temporary visits (machine storage, garage, warehouse) are required to have 50 Lux at least. Medium precision work and Precision work are required to have between 200-500. The blower outlet in each floor require only little amount of attention and therefore the results are compared with 100 Lux. For the computer table and center control room, medium precision is required and therefore it is compared with 200-500 Lux. The measurement places of the boiler room, blower outlet, central control room, and warehouse are observed that are in proximity to the standard value of EHS Guidelines. According to a field survey, these places can be defined as an acceptable range of Lux value.

If the results are higher or lower than the standard guidelines, the workplace might be harmful to the workers in the factory. In fact, too much or too little light strains eyes and may cause eye discomfort (burning, etc.) and headaches. If the results are not within the standard guidelines, the mitigation measure will be needed but due to the fact that current conditions within standard guidelines, the mitigation measure is not needed.

## **APPENDIX A**

### **Data Sheets**



# HEXAGONAL ANGLE

INTERNATIONAL CONSULTANTS CO.,LTD.

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Website: [www.hexagonalangle.com](http://www.hexagonalangle.com)

## Light Measurement

Project Name : Dehes Project No. L-2201  
Sampling Date: 7.1.2022 Station. \_\_\_\_\_  
Operator: Win Wah Oo

No.	Site Description	Detail	Time	Lux	Detail	Time	Lux
1	<ul style="list-style-type: none"><li>Location</li><li>Distance of road</li><li>Other activities around station</li><li>Outdoor or indoor</li><li>Reference Plane and height</li></ul>	Barter Computer table LED - 3625.9"	10:00 10:31	315 316			
2	<ul style="list-style-type: none"><li>Location</li><li>Distance of road</li><li>Other activities around station</li><li>Outdoor or indoor</li><li>Reference Plane and height</li></ul>	8. floor Blower Outlet Main Blower	10:06 10:41	160 165			Temp. 26.6°C
3	<ul style="list-style-type: none"><li>Location</li><li>Distance of road</li><li>Other activities around station</li><li>Outdoor or indoor</li><li>Reference Plane and height</li></ul>	7. floor Blower Outlet 2nd floor 8.625"	10:08 10:43	180 120			
4	<ul style="list-style-type: none"><li>Location</li><li>Distance of road</li><li>Other activities around station</li><li>Outdoor or indoor</li><li>Reference Plane and height</li></ul>	6. floor 102m 8.9"	10:11 10:46	95 102			

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# **HEXAGONAL ANGLE** INTERNATIONAL CONSULTANTS CO.,LTD.

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5.	<ul style="list-style-type: none"> <li>Location</li> <li>Distance of road</li> <li>Other activities around station</li> <li>Outdoor or indoor</li> <li>Reference Plane and height</li> </ul>	<p>5 floor</p> <p>8:10am</p>	<p>10:15</p> <p>10:48</p>	<p>155</p> <p>153</p>			
6.	<ul style="list-style-type: none"> <li>Location</li> <li>Distance of road</li> <li>Other activities around station</li> <li>Outdoor or indoor</li> <li>Reference Plane and height</li> </ul>	<p>4 floor</p> <p>8:10am</p>	<p>10:17</p> <p>10:50</p>	<p>120</p> <p>150</p>			
7.	<ul style="list-style-type: none"> <li>Location</li> <li>Distance of road</li> <li>Other activities around station</li> <li>Outdoor or indoor</li> <li>Reference Plane and height</li> </ul>	<p>3 floor</p> <p>8:10am</p>	<p>10:20</p> <p>10:52</p>	<p>105</p> <p>103</p>			
8.	<ul style="list-style-type: none"> <li>Location</li> <li>Distance of road</li> <li>Other activities around station</li> <li>Outdoor or indoor</li> <li>Reference Plane and height</li> </ul>	<p>2 floor</p> <p>CCR</p> <p>Center Control Room</p> <p>8:10am</p>	<p>10:22</p> <p>10:53</p>	<p>350</p> <p>256</p>			
9.	<ul style="list-style-type: none"> <li>Location</li> <li>Distance of road</li> <li>Other activities around station</li> <li>Outdoor or indoor</li> <li>Reference Plane and height</li> </ul>	<p>1st floor</p>	<p>10:24</p> <p>10:55</p>	<p>200</p> <p>205</p>			
10.	<ul style="list-style-type: none"> <li>Location</li> <li>Distance of road</li> <li>Other activities around station</li> <li>Outdoor or indoor</li> <li>Reference Plane and height</li> </ul>	<p>First Goods Warehouse</p> <p>8:10am</p>	<p>10:26</p> <p>10:56</p>	<p>530</p> <p>550</p>			

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**APPENDIX B**  
**Calibration Certificate**



## CERTIFICATE OF CALIBRATION

Instruments details AS823  
Model number: Lux Meter  
Description: 4153538  
Serial number:  
Date of manufacture: 2019-8-17

JJG245-2005

Reference documents for the calibration:

Place and environmental conditions of the calibration:

Place SMART SENSOR FQC Temperature 23°C~27°C RH 50%RH~75%RH

Function Range Mode	Normalized Value	Actual Value	Permissible Error
	(Lux)	(Lux)	(Lux)
Measure value	100	97	-3.0
	150	153	3.0
	200	199	-1.0
	500	503	3.0
	1000	1003	3.0
	1500	1498	-2.0
	2000	2001	1.0
	3000	2999	-1

Unit: Lux





## **APPENDIX – H**

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