



**DEMERARA
DISTILLERS**
LIMITED

MOBLISSA INTEGRATED DAIRY FARM

PROJECT SUMMARY May 2022

Prepared by:

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Prepared for:

Environmental Protection Agency Guyana
Ganges Street, Sophia
Georgetown



DOCUMENT DETAILS

Document:	Project Summary Outline for Development of a Dairy Farm
Description:	This report details the activities that will be undertaken by the DDL for the development of an Integrated Dairy Farm at Moblissa, Linden-Soesdyke Highway.
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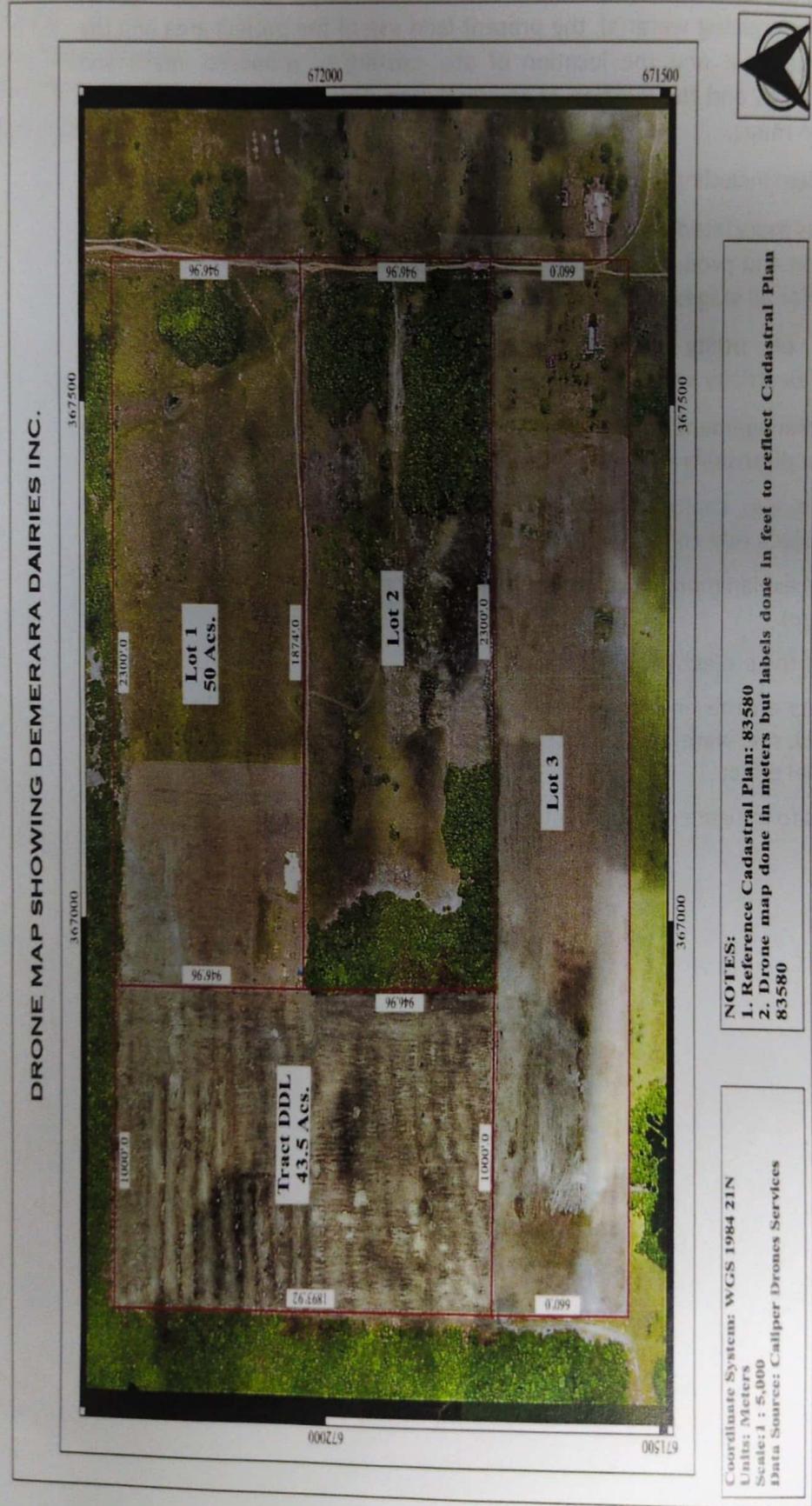
1. EPA Requirements for Project Summary Outline

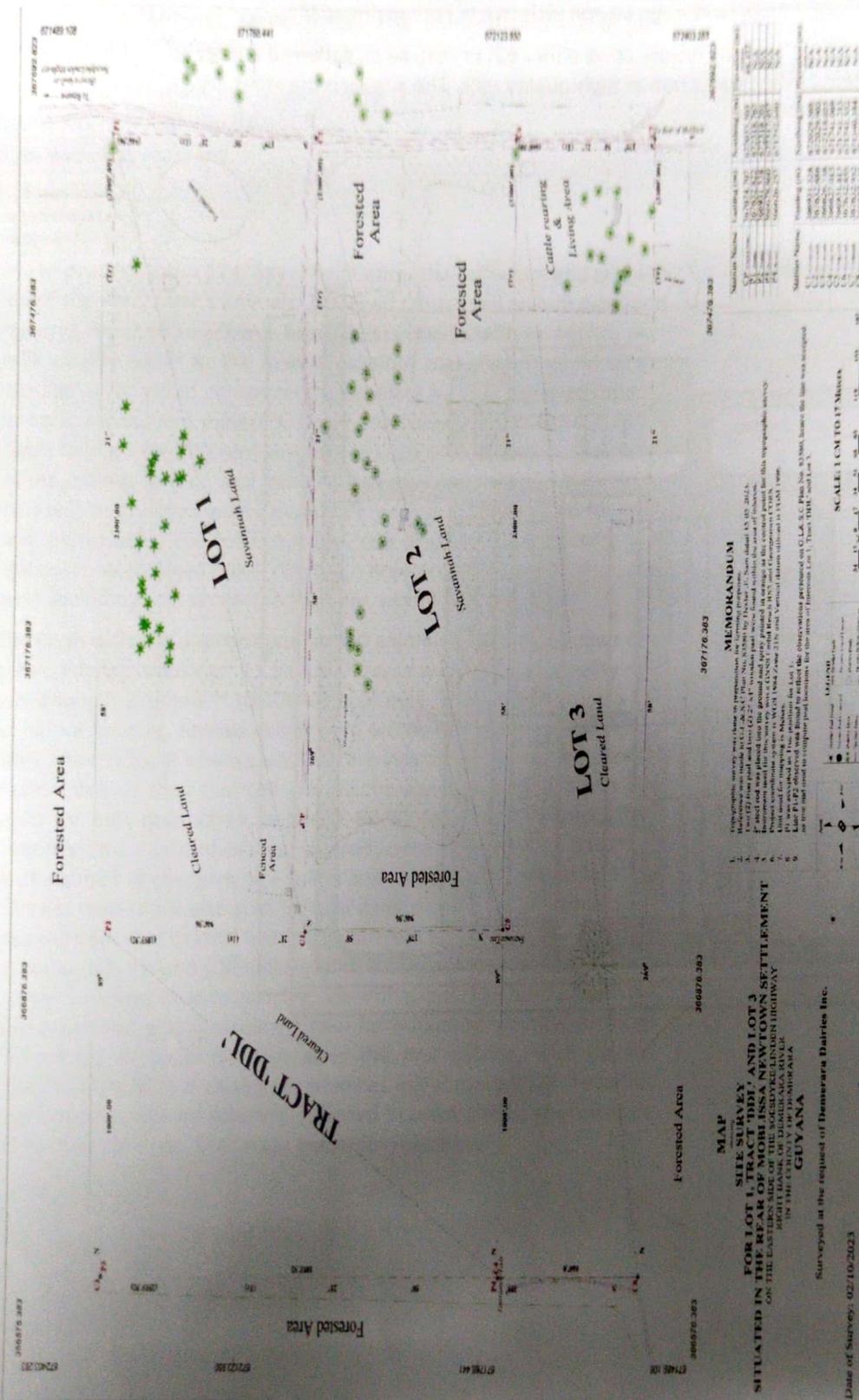
In accordance with s.11 (1) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the following indicates the requirements for Project Summaries submitted to the EPA:

1. Cover Page – Name of Project, Name of Developer/Company, Contact details, Date prepared and by whom.
2. A description of the site which should include the area of influence (spatial and temporal boundaries), location, land requirements (area occupied), layout, identification of receiving water(s), the present land use of the project area and the areas contiguous to it and the location of any existing or proposed intake and discharge structures and the location of any discharge. This information should also be presented on maps.
3. The project design including:
 - Activities associated with all development stages from construction to closure operation and production processes and alternatives considered e.g., provide a guide for all stages of the project from raw material to the finished product.
 - Source of utility services such as water supply and treatment, energy/electricity and communication, facilities, etc.
 - Waste management details which should include types of waste and methods of waste disposal/treatment.
4. The project size, e.g., capital investment, number of employees projected for each stage of the project, rates of production, etc.
5. A non-technical explanation of the project (a summary of what the project is about in layman language).
6. The duration of the project (for each phase).
7. Potential effects on the environment which may result from the existence of the project i.e., land, soil, water, air, the use of natural resources, etc. A brief description of each potential effect.
8. Proposed plans to mitigate environmental impacts.

2. PROJECT SITE DESCRIPTION

The farm's location is in close proximity (~8 km) east to the Georgetown Linden highway, about 20 km Northeast to Linden, and 120 km Southeast from Georgetown. The coordinates are N – 672318.774, E – 367632.668, N – 672030.134, E – 367632.667



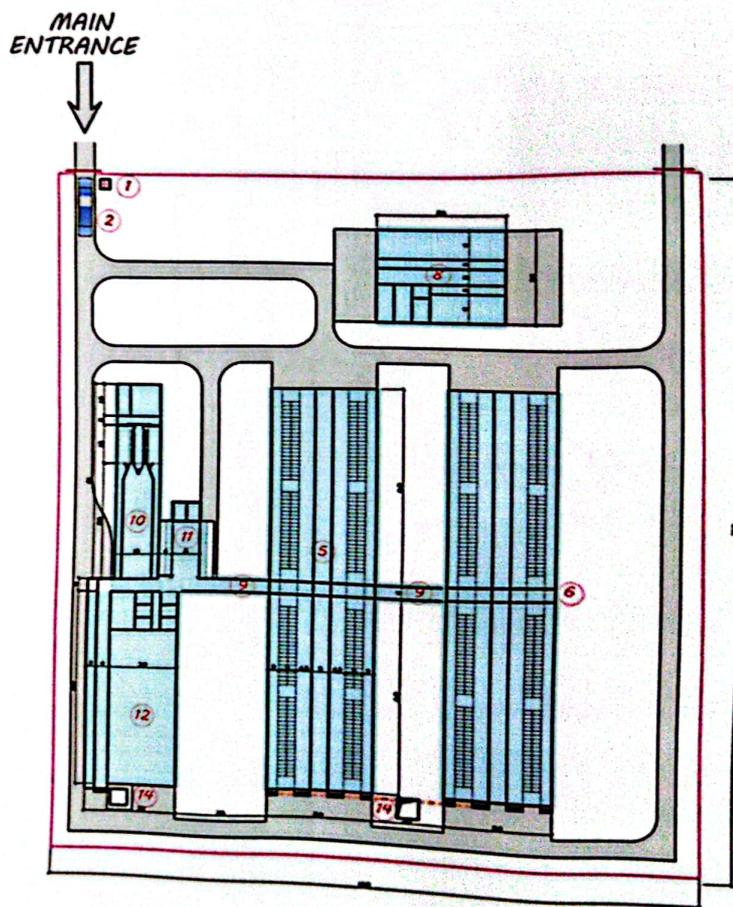


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3. PROJECT DESIGN

The land will host a parking lot, guard house, showers and lockers, disinfection pit, feed preparation yard, weigh bridge, tractors shed, seed, fertiliser and pest storage concentration feed storage, hay barn, silage storage, cows and heifers shed, special needs shed, calves and weaned calves shed, milling center, treatment pen, cow traffic lane, animals loading ramp, manure pumping station, and manure storage lagoon inclusive of connecting roads.

The conceptual design of the Farm will ensure cows either eat or rest, so all gathered energy is mainly channelled towards the production of high-quality milk. The site plan drawings are attached with this project summary.



Commented [TC1]: Kindly provide

Commented [MW2R1]: The plan was submitted to the agency. That is the entire site with key included.

3.1. PROJECT ACTIVITIES

The Project will comprise of the following components:

1. **Approximately 250 hectares of field crops** – this will be established adjacent to the Dairy Complex capable of growing and supplying all of the dairy farm forage needs. The cultivated land can be distributed between farm self-cultivated lands and local farmers (through “contract farming” agreements). The planned crops and their respective growing cycles are as follows:

- Mombasa Guinea Grass (*Panicum Maximum*) for 2 to 3 years,
- Forage Maize (Corn) for 90-100 days,
- Tropical Lucerne for 1 year, and
- Cow Pea for 1 year.

Commented [TC3]: What crops are intended to be grown?

Growing cycle of these crops?

What methods would be used for cultivation (hydroponics, land cultivation etc)?

2. **A Feed Center able to process about 22 t/day** - Feed Center that will store and prepare feed rations for all of the dairy farm's animals. The Feed Center will ensure provision of the dietary elements required to achieve best-in-class results with respect to per-cow yield and milk quality levels at the lowest possible cost. The Feed Center is responsible for storing various feed components, including forages (ensiled or baled as hay), grains, protein meals, and minerals. It will then create computerized Total Mixed Rations (TMR) tailored for different livestock groups such as milking cows, dry cows, mature heifers, young heifers, and calves, utilizing a specialized TMR mixing wagon. The animals will be provided with a variety of feeds that will be used for both breeding cattle and dairy cattle. The feeds are inclusive of grains such as corn, oat, wheat; protein meals such as soybean meal, rice bran, brewery spent grains, etc.; and minerals & vitamins, including salt, protected fat, lime, vitamins.

Commented [TC4]: Will the feed centre deal with production of the feed (milling etc.) or would it be primarily storage? Kindly explain the process of this component.

What kind of feed will be used for the animals?

Is the feed used from primarily breeding cattle or both dairy and breeding?

3. **A Dairy Farm** – The Farm will have approximately ~900 animals (500 milking cows and ~415 following heifers) daily producing ~ 11.5 tons (7 days / week) of high-quality raw milk. Each cow will annually produce ~ 10,000 liters of milk. The rearing process for the cows involves indoor housing. Female calves born on the farm are kept until they reach approximately 14 months, at which point they are inseminated. After a 9-month pregnancy, the heifers deliver their first calf around the age of 2 and then join the milking cows' group for milk production. Between 60-90 days after delivery, they undergo insemination for their second calving. Unproductive milking cows, based on economic standards defined at the farm, are culled and can be sold to local farmers or for slaughter. Excess heifers are also sold to local dairy or beef cattle farmers for fattening. All male calves are sold to local beef cattle farmers at 3-4 weeks of age. The herd is planned to stabilize at around 500 milking cows and approximately 420 heifers at different ages after 3-4 years. Due to housing size limitations, the herd cannot be increased, and any expansion would require a new farm in close vicinity. Artificial insemination is scheduled to begin 60 days after the first calving, with on-site insemination starting in May 2025 if calving commences in February 2025. Facilities for calves and pregnant cows include specially designed housing sheds, approved by the GLDA, tailored to their life cycle. See image below for reference.

Commented [TC5]: Will the cows be reared free-range or indoor?

An explanation of the rearing process is essential, especially regarding the methods of dealing with unproductive cows



4. **A Milk Processing Plant** - Plant with the capacity to produce 19 t/day (5 days/week) of premium milk products, will involve milking cow groups.

Each group consisting of 84 cows, being brought to the milking parlour three times a day (every 8 hours) for milk harvesting. The milking parlour is equipped with 28 milking stands, and after each session, the cows return to their shed for eating, water drinking, resting, and milk production. During their waiting time at the milking parlour, the cows undergo body temperature cooling sessions and forced ventilation using a designated cow-cooling system. Electronic receivers at the milking stands retrieve health and production data of each cow, which is processed in the farm's computer for future individual and group management, including feeding, veterinary treatment, insemination, hoof trimming, culling out, etc.

The Milk Processing Plant is situated at the Topco facility in Diamond and has obtained all the necessary approvals from the Food and Drugs Department to operate.

In case of spoilage or overproduction of milk products, Topco has an on-site milk waste processing facility. Currently, the project focuses solely on milk production, and any plans to diversify or introduce by-products such as yogurt or cheese will be communicated to the EPA and relevant authorities.

Commented [TC6]: Kindly explain within the Milk Processing Plant.

Does the facility have the relevant approvals from the Food and Drugs Department?

Commented [TC7]: What will occur in case of spoilage and/or overproduction of milk?



3.2. Utilities

- **Water Supply** – There is currently an abandoned well opposite the site that was cleaned and serviced for use as a water source. Currently operating at 25 gal/min. There will be two (2) other wells developed to be used for irrigation purposes, before and after drilling, all necessary approvals will be obtained.
- **Energy/electricity** – Power supply will come from the Linden Power Company. The company is currently awaiting approval before having the poles and power lines installed. Solar panels will be installed on the farm to generate and store power in batteries for on-demand use. Additionally, a backup generator is in place for essential activities such as milking, cooling, and water well operations, ready to be utilized as necessary.
- **Communication** – The company is arranging for E-NET to install communication equipment.

Commented [TC8]: Does the facility have the relevant approvals from HYDROMET?

Commented [TC9]: Will there be generators used on site? If yes, how many and their capacities?

3.3. Waste

The majority of organic waste, estimated at 1000 lbs per day, primarily consists of manure.

Manure management is conducted on a constant basis with specific procedures for different areas. Sixty percent of the daily manure produced by the animals is deposited on the concrete standing lane while they eat, and an automatic manure scrapers system moves it to the end of the shed. The manure is then transferred to a manure collection ditch, serving all sheds, and flushed into a manure collection pit. From there, it is mixed and pumped into the manure storage lagoon for approximately 100 days of oxidization. Thirty percent of the manure is deposited in the bedding area, where it undergoes semi-composting through aeration by a designated cultivator and the ventilation system inside the sheds, serving as bedding material. Annually, the accumulated dry manure in the bedding area is cleaned and spread on field crops lands as organic fertilizer. The remaining 10% is deposited on the milking parlour concrete floor, manually cleaned with water, and the effluents are pumped into the manure collection ditch, serving as flushing liquid to move all manure scraped from the sheds into the manure pumping pit and then to the manure storage lagoon.

Regarding the manure storage lagoon, it measures 42x31x4.5 m, with a capacity of approximately 5,000 m³. Considering 500 cows producing 60 liters of manure per day and 400 heifers producing 30 liters per day, the lagoon receives around 40 m³ per day of waste, consisting of 25m³/day of liquid manure and 15m³ of effluents from the milking parlour facility.

The Farm will collect and treat all organic waste, including dead animals and spoiled milk products, from both the farm and processing plant. This waste will be converted into valuable crop fertilizer products (compost material) and energy. Dead animals, checked by a government veterinarian, are incinerated, while organic waste is transferred to a designated manure lagoon. Subsequently, a 9m³ manure tanker wagon transports the manure to field crops lands, where it serves as organic fertilizers for forage crops. Municipal waste, including sewage, is collected in septic tanks, and regularly emptied, then transported to the nearest municipal waste handling facility. Solid waste, encompassing garbage and construction waste, is collected in bins, and evacuated to the nearest municipal waste handling facility. Effluents generated from holding and milk production facilities, exclusively organic, undergo

Commented [TC10]: Other waste stream should be discussed in this section including:
1. Organic waste (dead animals, spoiled milk products)
2. Municipal waste (sewage)
3. Solid waste: garbage, wastes from construction etc
4. Effluent generated from holding facility and the milk production facility

treatment, including mechanical stirring at the manure lagoon for oxidization over approximately 100 days. After treatment, the effluents are pumped out and utilized as organic fertilizers in the operational field crops.

4. PROJECT SIZE & INVESTMENT

4.1. Investment

The total investment into the project is USD \$14.42M

Capex	Amount (USD M)
Field Crops	2.15
Dairy Farm & Feed Center	11.27
Total EPC	13.42
Working Capital	1.0
Total Investment	14.42

4.2. Employment

The project is expected to maintain a total of Seventy-one (71) direct employees:

- Three (3) corporate employees
- Thirty (35) workers for the Dairy Farm
- Eight (8) workers for the Crop Farm
- Twenty-five (25) workers for the Milk Production Plant.

The project will impact the Linden region by providing about 150 indirect jobs. During the establishment stage, it is expected that additional ~200-250 direct jobs and ~500 indirect jobs will be created. The project will follow standard Guyanese government health and safety protocols. All personnel involved in activities will be equipped with appropriate PPE at all times. Essential PPE may include but is not limited to: safety boots with steel toes, overalls, gloves, safety goggles, hearing protection for noisy environments, etc. There will be personnel responsible for Health, Safety and Environmental management to ensure the wellbeing of personnel and the environment during operational activities.

4.3. Rate of Production

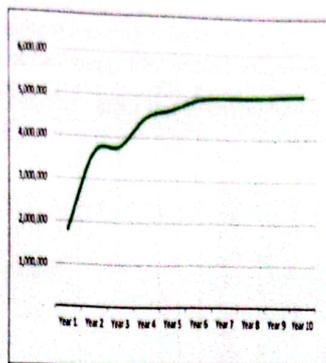
The Dairy Farm will manage approximately ~900 animals (500 milking cows and ~415 following heifers) daily producing ~ 11.5 tons (7 days / week) of high-quality raw milk. Each cow will annually produce ~ 10,000 liters of milk. The Milk Processing Plant will concentrate on the production of approximately 19.2 tons daily (5 days/week) of premium milk products.

As stated at 3.1 (3), after 3-4 years the herd will be stabilized at ~500 milking cows + ~420 heifers at different ages. Due to its housing size, the herd cannot be increased. Increasing its size can only be done in a new farm to be built in close vicinity.

Commented [TC11]: What health and safety measures would be in place for employees in all facilities?

Commented [TC12]: Will the herd be stabilized at 900 animals or is it expected the herd be increased? If so, what is the number and timeline is it expected that the herd be stabilized?

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10
Daily Milk per cow (lt)	25	26	27.5	28.6	29.7	30.9
Number of milking cows	196	454	432	500	500	500
Avg. milked cows / day	196	361	377	429	430	444
Daily Milk all cows (lt)	4,950	9,906	10,351	12,250	12,769	13,713
Annual Milk all cows (lt)	1,806,750	3,615,690	3,778,083	4,471,166	4,660,851	5,005,104



5. NON-TECHNICAL/LAYMAN EXPLANATION OF THE PROJECT

The Project will follow the proven and perfected "Israeli Dairy Farming Concept," which produces the world's highest milk production per cow. The operation will see the establishment of an Integrated Dairy Farm involved in the following activities:

Field Crop Production, Feed Processing, Dairy Farming, and Milk Production for sale.

The property will host a parking lot, guard house, showers and lockers, disinfection pit, feed preparation yard, weigh bridge, tractors shed, seed, fertiliser and pest storage concentration feed storage, hay barn, silage storage, cows and heifers shed, special needs shed, calves and weaned calves shed, milling center, treatment pen, cow traffic lane, animals loading ramp, manure pumping station, and manure storage lagoon inclusive of connecting roads.

This project is the first of its kind in Guyana and will provide top level training program for the enterprise's employees by highly experienced trainers on crop production, irrigation, fertilization, tillage and soil preparation, plant protection, post-harvest, herd management, artificial insemination, nutrition, and other programs as the need develops.

Sharing and transfer of skills and dissemination of knowhow will enable the Guyana team to efficiently manage the farm and form the foundation for the development of a modern dairy sector for the entire country.

The long-term impacts of the project include:

- Food security & Import-free – minimize need for importing dairy products and milk powder.
- Job creation & Diversification – add new jobs (direct, indirect, and induced), create new agricultural professions and food processing professionals.
- Training & Know-how transfer – Implement the most advanced Israeli technologies & know-how and build training scheme for long-term success.
- Local sector participation – Join in as many local farmers into the farm's activities, integrate the farm's activities with current local abilities for long-term cooperation and prosperity.

Commented [TC13]: Will the project entail a feed mill within the feed centre?

Commented [MW14R13]: Primarily storage. Please see 3.1 (2)

Commented [TC15]: Kindly provide additional details on the manure storage lagoon including dimensions, materials used etc

Commented [MW16R15]: Please see 3.3

Commented [TC17]: How soon is it intended to begin artificial insemination as part of the project? Will this be done on site?
What facilities will be in place for the calves and pregnant cows?

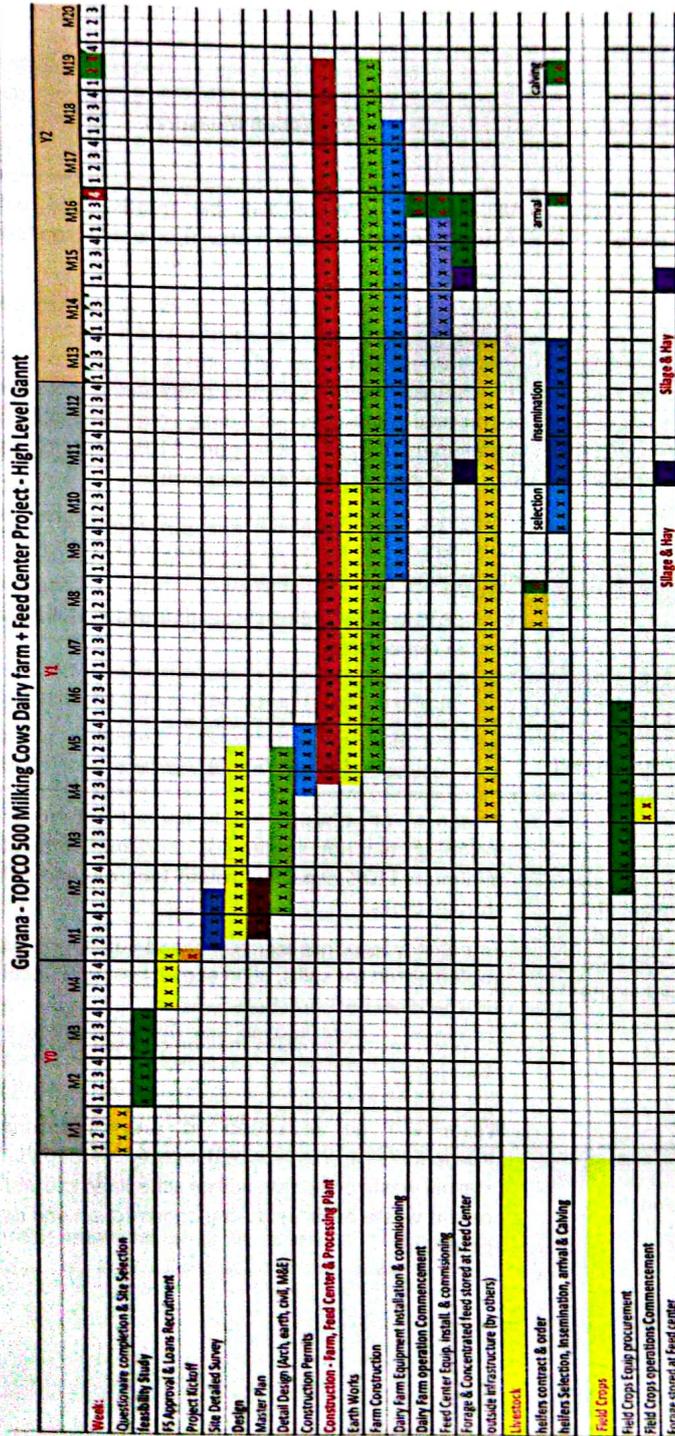
Commented [MW18R17]: Please see 3.1 (3)

- **Technology & Modernization** – Introduce the latest technologies and methods of breeding, growing, harvesting, and processing, build long-lasting production chains.
- **Profitability & Sustainability** – Strive for a profitable and self-sustained Dairy Operation with positive economic influence.

6. PROJECT DURATION

The project milestones are as follows:

- Establishment period – 14-16 months
- First milk production - within 16 - 18 months from Detailed Design



generators, including but not limited to dust from access roads, excavations, and stockpiles.

No.	Potential Environmental Impact	Mitigation Measures
1	Noise from construction and operating machinery.	<ul style="list-style-type: none"> Noise nuisance shall be kept in accordance with whatever limits are imposed by the EPA, Environmental Protection (Noise Management) Regulations for the location. Noise monitoring will be carried out routinely to determine significant noise-producing areas/equipment where PPE use is mandatory.

7.4. Biosecurity

No.	Potential Environmental Impact	Mitigation Measures
1	Spread of diseases	<ul style="list-style-type: none"> The herd will be protected with the highest possible immunization coverage. The farm perimeter will be completely fenced. Perimeter fencing will be put into place. Two vehicle entrances will be implemented and equipped with designated disinfection pits with disinfectant solutions. Individuals entering will disinfect shoes and wear plastic covers. Workers will undergo showers and clothing changes at the showers & lockers building at the main farm entrance. Security personnel will be stationed at all entrances 24/7. Entrance/Exit to farm will be guarded. A "hospital shed" on the farm will be implemented to serve as a quarantine area for sick animals, providing isolation and veterinary care. In the event of disease outbreaks, the fenced farm allows for additional isolation between sheds.

Commented [TC23]: What other bio will be put in place?

Would there be a quarantine area for s

Commented [TC24]: Is there a plan to deal with disease outbreaks among the