

1.0 PROPONENT

a) Name of Proponent

KMMCF inc. (in the process of being registered)
313 Rue du Pecheur Nord
Lameque, NB
E8T 1K9
grecycle99@gmail.com
(506) 340-3286

b) Principal Contact Person

Gaetan Chiasson, CEO, (506) 340-3286

c) Property Ownership

The ownership of the buildings is also in the process of being transferred to KMMCF inc.

2.0 PROJECT DESCRIPTION

a) Project Name and Overview

The company will be named KMMCF inc. [REDACTED]

[REDACTED] The project consists in a cricket farm operated in two buildings situated on Lameque Island. We aim to raise crickets for animal and human consumption in the Atlantic Provinces. The products will be sold as live crickets or frozen.

b) Purpose/Rational/Need for the Undertaking

The edible insect industry is fairly new in Canada, around 10 years in some provinces like Ontario. At the beginning, we will be breeding high quality crickets for clients of Ontario's Third Millenium Farming, while building client base in the Atlantic Provinces. Our main market will be companies that provide food to different livestock (beef, chicken, etc.), aquaculture, food companies, dog food companies, restaurants, pet stores and directly to consumers. Third Millenium Farming is a company specializing in cricket breeding and technology research to constantly improve cricket breeding. We have reached a licensing agreement between the two companies.

As the world's population continues to grow and is expected to reach 9 billion by 2050, rising incomes have led to a growing demand for a meat-based protein source. This led researchers, entrepreneurs and also the United Nations to research for a cheaper source of animal feed, which led to insects as the perfect replacement. More than 2 billion people are currently eating insects and there are more than 1900 types of edible insects in the world.

An increase in demand for animal protein between 70 and 80 percent is expected between 2012 to 2050, but the animal production sector is already a major cause of environmental degradation. Although edible insects are considered a more sustainable source of animal protein, there is little available data on their impact on the environment.

However, when a life cycle study of insects production was conducted using factors such as energy use, land use and greenhouse production, it was found that a source of Conventional proteins such as pork or beef led to increased use of energy, land and emissions. This has shown that insects are a more sustainable source of dietary protein. Refocusing on edible insects will likely weigh on global market demand as more and more people are considering eating healthy foods for themselves and their animals. It is estimated that one acre of land can produce about 150 tons of cricket protein in one year. Growth in this sector is not likely to come from demand alone, as the low cost of raw materials, transactions, transportations and implementation will likely contribute to the growth of the sector

c) Project Location

The project will be situated on the land with the PID number 20562427. The street address is 313 Rue du Pecheur Nord, Lameque, NB. The Latitude and Longitude are 47°49 North and 64°36 West. A map is featured in Annex 1.

d) Siting Considerations

The site was chosen for a couple of reasons. First of all, the buildings are owned by my family. The buildings used to be a fish plant so the walls are already food grades. It's also the only land within the Lameque City vicinity that is industrial. Also with that project, I will make the buildings relive like the best days of the fish plant. Since I save around 300 000\$, I didn't consider other sites.

e) Physical Components and Dimensions of the Project

The two buildings were constructed in the early 80's. There will be no addition to the buildings. The only modifications will be inside.

f) Construction Details

The only construction that will be needed are the renovations of the buildings. The roof will be redone on the bigger building and the outside of the two buildings. For the inside, we will do the insulation so we can heat the buildings at a temperature of around 35 Celsius degrees and also to be able to heat the buildings at a temperature of 70 Celsius degrees for a period of 48 hours in case of health problems to the crickets. These renovations will take around two months to finish. For construction wastes, I'll have a bin to put the waste inside and this bin will be brought to the waste site in Tracadie-Sheila.

g) Operation and Maintenance Details

Production : Every week, egg trays are received. The egg trays are incubated in the growout room. Once the eggs hatch, they are put in drawers.

Each drawer has a water tank and a feeding tray.

The crickets stays in the drawers for 3-4 weeks and then they are harvested.

Each drawer gets vacuumed up to pull the frass which will be sold for plant fertilizer. The water and feed on each drawer is refilled.

Depends on the orders and customers, the crickets are packed in boxes of 1000 counts or put in a freezer.

Cleaning : The floor will be kept clean by vacuuming, sweeping and washing every day.

Water use : Approximately 5000 Liter per months. The source of water is from Lameque Aqueduc.

Products : Approximately 8 million crickets will be harvested every month. The final product should be around 5 100 boxes of 1000 counted cricket, 650 pounds of frozen crickets and 1600 pounds of waste, that will sold has frass.

Storage : All materials will be kept inside of the buildings. The raw materials in the drawers and finished products in the freezer. No live stocks will be stored.

Energy : The buildings are connected to a 3 phase energetic system. And the power will be provided by NB Power.

Raw Materials : The cricket eggs will come in egg trays every week. They come from Third Millenium Farming in Mississauga, Ontario.

Wastes : All cricket wastes will be collected and will constitute what we call, frass and be sold for plant fertilizer.

Vehicles : The only vehicles that will come and go are Purolator trucks witch come once a day.

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

a) Physical and Natural Features

- Surface drainage : The majority of the property drains toward the northwest.
- There's wetlands in the northeast of the property.

4.0 IDENTIFICATION OF ENVIRONMENTAL IMPACTS

Here are 3 environmental impacts that I identified :

- The existing ambient noise levels could be affected by the male crickets chant.
- There's a slight chance of crickets escaping the buildings and get out in the local environment.
- The cricket population could get a disease and spray it throughout the local environment.

5.0 SUMMARY OF PROPOSED MITIGATION

- The existing ambient noise levels could be affected by the male crickets chant.

Only 1% of the crickets population in the buildings are males. So approximately 50 000 crickets in one and 30 000 in the other. Since we have to insulate the buildings to sustain heat to a high of 70°C to annihilate virus in cricket population, this will also provide sound proofs walls and mitigate that risk.

- There's a slight chance of crickets escaping the buildings.

Crickets are physically contained in a nested system of enclosures. The cricket habitats are nested in a large racking system (kind of like drawer).

Each drawer has an escape-proof lid. The side of the drawers is slippery. The cricket habitats are designed to contain crickets throughout their entire lifespan, from pinhead to an adult. Pinhead crickets are less than 1mm x 1mm, and so the habitats are designed to with a high degree of accuracy to prevent escape. In Other words, if the habitats contain pinhead crickets, they will have no trouble containing adult crickets, which are about 1" long. It is also worth noting that pinhead crickets cannot survive for more than a few hours without easy access to food, water and heat. If pinheads were to escape, they would die before they could leave the room. The hot room is a highly insulated room that contains all of the crickets habitats. We insulate the room with spray foam insulation. This creates an airtight seal around the entire room. Therefore, the only possible escape for crickets would be through doorways or air vents. All wall surfaces around vents and surfaces around doorways are designed to be slippery for crickets. In other words, we prevent the cricket from climbing on the walls. We also prevent escape through doorways by installing 6" step at each door. The step is slippery for crickets, which prevents them from walking out of the hot room. Finally, we keep the hot room very clean, by vacuuming the floor area every day. As a result, if any crickets were to escape the habitats, they would not be able to leave the hot room. Furthermore, because the hot room is very warm, and there is no food or water spilled on the ground, any cricket that escapes would die within a few hours.

The cricket farm is also setup to contain crickets. All food is kept in sealed plastic containers. We do this to prevent other insects from infesting our feed, and contaminating our cricket population. However, it also works toward preventing crickets from escaping, because we deny any escaped crickets a source of food. Similarly, we have procedures in place to ensure that water fountains are only assembled, and filled with water, inside of the hot room. Finally, we keep the floor area clean by vacuuming and sweeping every day. As a result, we would see crickets running around if they escaped. All of these measures are primarily in place to prevent other insects from getting in our farm, but they also work well in preventing crickets from escaping.

We take great care in helping the crickets reproduce. The crickets require specific mixtures of water and soil to lay their eggs. Then we follow specific incubation steps to ensure that the crickets hatch. Finally, the crickets hatch in large plastic trays, and in order to leave those plastic trays, they require our help. We have to provide bridges for them to get out, and to access food and water. Our cricket have been bred in captivity for so long that they require help to reproduce in large numbers. If they were to escape into the wild, they would likely not be able to reproduce in sufficient numbers to survive.

Active measure used to contain cricket escapes are sticky strips. These are plastic strips with special glue on them to that trap crickets that step on

them. We place these around all potential exits from the farm. We also setup, cricket traps by baiting the crickets into stepping on sticky strips, falling or falling in cups of water.

- Disease control

Our best line of defence is Biosecurity. We try to minimize new things coming into the farm. We limit the amount of visitors, and if we must have visitors, we take precautions, such as having them do a foot wash and wear a plastic one-piece suit. If we do have issues with viruses or bacteria, we purge the cricket habitats that appear to be infected in order to limit the spread.

Typically, this set of precautions is sufficient to ensure the farm doesn't succumb to disease. However, in extreme cases, such as airborne lethal viruses, we can make a full purge of the farm. This can involve purging the entire population of crickets and letting the farm lay fallow for several months. There is strong evidence to support the idea that we can decrease the required fallow period by raising the temperature in the farm. Raising the temperature should cause viruses to break down faster. Finally, our last line of defence is to evacuate all people from the farm and raise the temperature in the farm to 70°C for 48 hours. This should be sufficient to kill the deadliest cricket virus (AdNV cricket densovirus). All of our farming systems and the materials used in the construction of the building, are designed to withstand heat to 70°C. It is also worth noting that there are no known viruses that can spread from either house crickets or banded crickets to humans. In fact, since insect DNA is further removed from human DNA than the DNA of farm animals, it is exponentially less likely that a virus would be able to spread from an insect to a human.

6.0 PUBLIC AND FIRST NATIONS INVOLVEMENT

A letter will be sent to all the Micmac communities in New Brunswick. A letter will also be sent to the two adjacent property owners, the Lameque mayor, Mr. Robert Gauvin, deputy of Shippagan-Les-Iles electoral district (provincial) and Mr. Serge Cormier, deputy of Acadie Bathurst electoral district (federal). In these letters, I will expose my project intentions, talk about the 3 risks and encourage them to communicate with me or go see my EIA project webpage for any concerns. I already went to speak to the Lameque City General Director, Dave Brown, to have a first feel on the projects. He talks to the mayor, Mr. Jules Hache, and they are open to this new type of business in their community.

After the undertaking span is finished, I will send a summary report of all the dialogues, to the Minister.