EXECUTIVE SUMMARY BASED ON DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Of

Distillery Expansion Project

30 KLPD to 100 KLPD

with

Change in process cane juice based to Molasses based

For

KARAN SUGARS PVT. LTD.

GAT No: 487/488 A/2 & 488A/3, HARWAD, TAL: SHIROL,
DIST: KOLHAPUR. (M.S)

JULY 2013

INDEX

Executive Summary

1.0 INTRODUCTION

M/s Karan Sugars Pvt. Ltd hereafter being refered as project proponent or KSPL has diverse interests in packaging, distillery, bottling, dairy and dairy products. The company is owned by Mr Dharmpal Kalani and his associates. KDPL has an existing distillery to produce alcohol @ 30 KLPD from cane juice. The unit is located at village Herwad in taluka Shirol in district Kolhapur.

M/s Karan Sugars Pvt. Ltd. proposes to expand existing distillery of 30 KLPD capacity to 100 KLPD capacity. The process of manufacture is also to be changed from existing cane juice based to molasses based. Since the project falls in category "A" of schedule of activities 5(g) of EIA notification SO1533 dated 14th September 2006 the proposed activity is under the preview of notification. The industry applied for TOR to the Ministry of Environment and Forest (MoEF) India and received approved TOR wide MoEF reference F. No. J-11011/857/2008- IA II (I) dated 25 Feb. 2009.

As per the TOR the industry has to prepare and environmental impact assessment (EIA) due to proposed activity. The draft EIA has been prepared and this summary is the executive summary of the same.

2.0 PROJECT DETAILS

KSPL is an existing industry. KSPL owns a plot in village Herwad. The details of expansion proposal are as under:

Sr No	Existing		Proposed	
1.	Capacity	30 KLPD	Capacity	100 KLPD
2.	Product	Alcohol	Product	Alcohol
3.	Raw material	Cane juice	Raw material	Molasses
4.	Raw material required	360 MT/day	Raw material required	400 MT/day
5.	Raw material source	Local farmers	Raw material sources	Sugar mills in vicinity
6.	Steam consumption	204 MT/day	Steam consumption	528 MT/day

7.	Boiler	14 TPH	Boiler	25 TPH
8.	Fuel bagasse /coal	138 MT/day	Fuel bagasse /coal	270 MT/day
9.	Ash generation	6.9 MT/day	Ash generation	13.5 MT/day
10.	Control equipment	Multicyclone	Control equipment	Multicyclone
11.	Ash disposal	Biocomposting	Ash disposal	Brick manufacturing
12.	Cogeneration of power	750 KW/hr	Cogeneration of power	2.2 MW
13.	Power required	1068 KW/hr	Power required	2200 KW/hr
14.	Water requirement	462 m3/day	Water requirement	1450 m3/day
15.	Source of water	Panchganga river 5 km	Source of water	Panchganga rive 5 km
16.	Spent wash generation	325 m3/day	Spent wash generation	800 m3/day
17.	Biogas generation	Nil	Biodigester	16000 m3/day
18.	After concentration	90 m3/day	After concentration	350 m3/day
19.	Disposal Biocomposting	13 MT /day	Disposal	Burning in boiler

3.0 LAND UTILIZATION

PP has in possession 28 acres land. Present factory is spread over in about 5 acres. Expansion proposal will need another 5 acres of land. 6000 m2 of land has been reserved for green belt development. About 300 plants have been planted. Balance land has been used for biocomposting, bagasse storage, ash storage, biodigestor followed by multiple effect evaporator, utilities etc.

The expansion with change in process will be done in existing land in possession of KSPL hence no additional land purchase is involved and no resettlement and rehabilitation issues are involved.

4.0 LOCATION

The distillery site is located at Village – Harwad, Tal. – Shirol, Dist. – Kolhapur, Maharashtra. The surrounding villages are Terwad, Kurundwad, Latwadi, Ghosarwadi, Akiwat, Takkiwadi, Majarewadi, and Bunal surrounded to the site.

The study area lies between the North Latitude:- 16^0 38’ to17^0 34’ and East Longitude:- 74^0 34’ to $75^0$19’ and can be located in survey of India Toposheet Nos: -47 L/10.

The area surrounding the proposed plant site is flat and is at the elevation about 557 meters above the sea level. The surface soil in the area is mainly red brown and light brown soil.

Rivers and Water Bodies:-

Panchganga River flows approx 5 km away from the site.

Nearest city : Shirol

Nearest highway : SH 137 -Echalkanji to Shirol

Nearest airport : Kolhapur 30 Km

Shirol is well connected to all the important places by Road.

Maharashtra is the Sugar Cane growing area and thus the raw material availability is assured.

Being industrially backward area, it attracts government incentives which can help to improve the economics of the project.

There is no wildlife sanctuary/reserve forest or archeological monument within 10 km radius from the site

4.1 COST OF PROJECT

PP has already invested in the existing project a sum of Rs 15.75 crores. Now factory proposes to set up modified equipment for change in process to molasses based process, treatment of spent wash by biodigester followed by multiple effect evaporator and burning in boiler, increased steam generation and cogeneration of power, Additional total estimated cost for above change is Rs 22 crores.

5.0 WATER BUDGET

Water requirement of existing project the increase due to expansion and change in process and total requirement are detailed below:

All values in m3/day

Particular	Existing	Proposed	Total
Process	360	900	1260
Condensing, cooling and blow down	60	140	200
Boiler Make up	126	340	466
Floor washing	05	10	15
Sanitary	05	10	15
Drinking	10	05	15
Greenbelt	10	20	30
Fire services	10	10	20
Total	**586**	**1435**	**2021**

5.1. Power required

The power required for the operating Molasses based distillery plant would be 2.2 MW. For uninterrupted operation of the plant a Turbo Generator set will be necessary. Existing TG set producing 750 KW/hr power will be retained and additional TG set to generate 2200 KW/hr shall be installed.

Power plant will be operated by steam generated from 25 TPH boiler using bagasse and or coal as a fuel. Plant steam requirements will be met from extracting steam at required pressure from turbine exhaust.

5 .2 Manpower Requirement

Total number of persons proposed to be employed for the proposed distillery is expected to be 70 in direct employment. In addition about 100 unskilled persons will be engaged in bagasse handling, ash processing, coal handling and transportation and will be indirectly employed.

6.0 MANUFACTURING PROCESS

Molasses is the major raw material used in India for production of Alcohol. Molasses contains about 50% total sugars, of which, 30 to 33% are cane sugar and the rest are reducing sugar. During the fermentation, yeast strains of the species saccharomyces cerevisiae, a living micro-organism belonging to class fungi converts sugar present in the molasses, such as sucrose or glucose to alcohol. Chemically this transformation for sucrose to alcohol can be approximated by the equation.

I) $C_{12}H_{22}O_{11} + H_2O = 2C_6H_{12}O_6$

Cane Sugar — Glucose

II) $C_6H_{12}O_6 = 2C_2H_5OH + 2CO_2$

180 = 2x46 + 2x44

Glucose — Ethyl Alcohol — Carbon- dioxide

The 180 gm of sugars on reaction gives 92 gm of alcohol.

Therefore, 1 ton of sugar will yield 511kgs of alcohol.

The sq. gravity of alcohol is 0.7934.

Therefore, 511kg of alcohol is equivalent to 511/0.7934=644 lires of Alcohol.

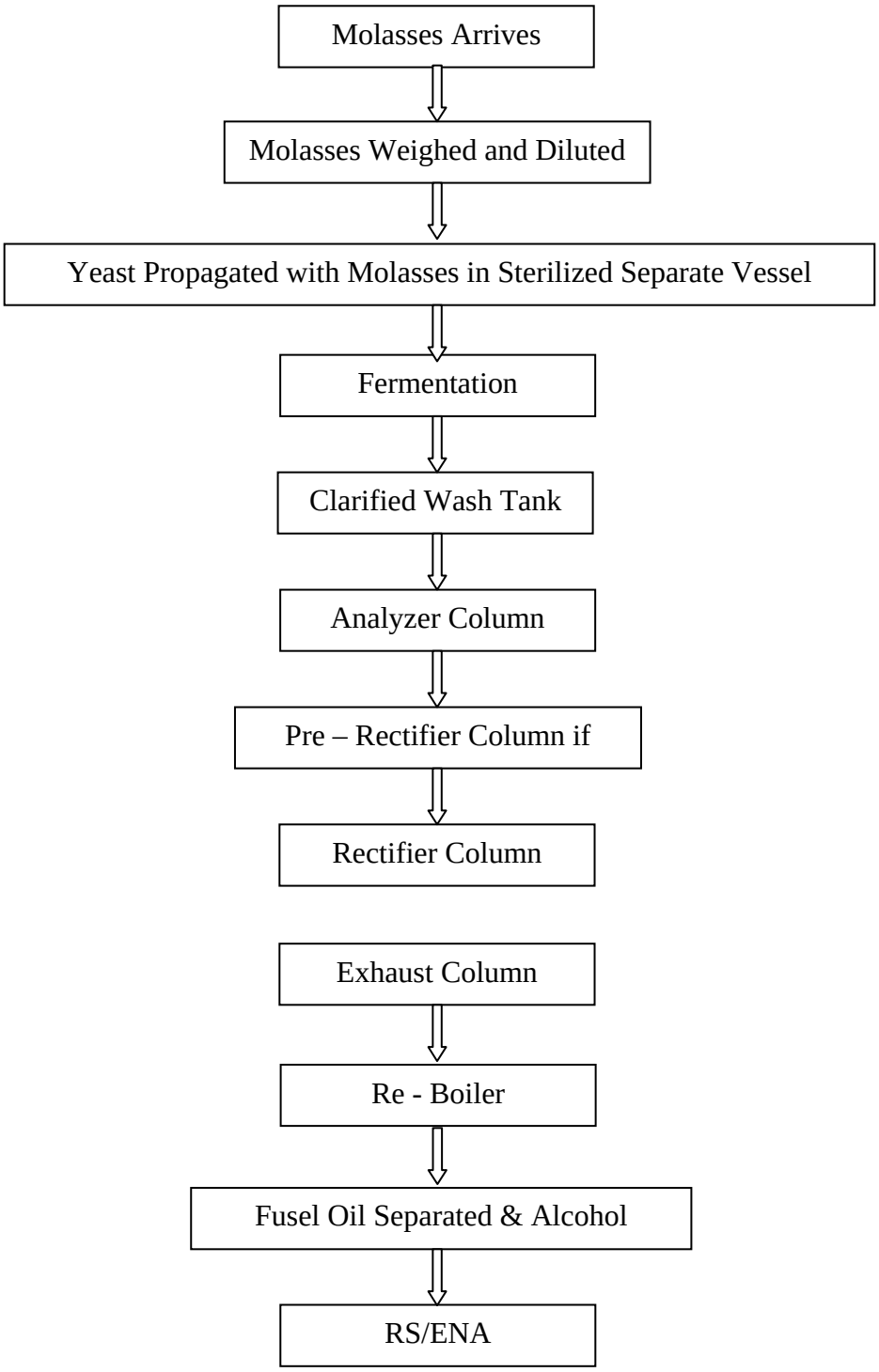
During fermentation other by products like glycerin, succinine acid etc. are also formed form sugars. Therefore actually 94.5% total fermentable sugars are available for conversion to alcohol theoretically.

Hence normally only 80 to 82% efficiencies are realized on plant. One ton of molasses containing 45% F sugars and gives alcoholic yield 255- 265 litres per tone.

Above biochemical reaction requires proper and careful handling of yeast, maintaining pH and proper temperature control and substrate concentration by which maximum conversion of sugars to alcohol is achieved.

Process flow chart of alcohol manufacture by molasses processing is given on next page.

Process Flow Chart



7.0 EMISSIONS AND DISCHARGES DUE TO PROPOSAL

7.1 Emissions in air:

When new boiler of 25 TPH will be run the existing boilers will not be required to operate. An estimated 1.35 MT/day of fly ash discharge is expected in air due to boiler operation.

7.2 Water pollution

The industry will utilize latest technology of treatment of spent wash 400 m3/day by recovering biogas and then concentrating followed by burning of spent wash in boiler, thus adopting zero effluent discharge system.

7.3 Noise pollution

Operation of a distillery does not involve any heavy duty impact type of machinery operation hence does not contribute to noise pollution.

7.4 SOLID WASTE MANAGEMENT

When new boiler of 25 TPH will be run the existing boilers will not be required to operate. An estimated 12.15 MT/day of bottom ash discharge is expected in due to boiler operation.

7.5 Biodiversity

The proposed activity is to be done at existing site itself. Further industry has opted for zero discharge system of spent wash treatment hence no effect is expected on existing biodiversity of region.

8.0 BASELINE STUDIES

The actual on site monitoring of existing environmental setting was done to establish the baseline conditions with respect to climate, hydrological aspects, atmospheric conditions, water quality, soil quality, vegetation pattern, ecology, socio-economic profile. The study covered an area within 10 km radius from the Plant site. The studies for the project was carried out in the study area in winter month after monsoon in 2012 Data on baseline condition of water environment of the study area was collected and observations are as under:

Parameters	Actual average values	Ambient Air quality
Pm10	70	100
Pm 2.5	45	60
SO2	9.2	80
Nox	7.6	80

It may be seen observed values of monitored parameters are within prescribed standards.(Monitoring location: Project site, Herwad, Takaliwadi, Dattawad and Abdul lat etc)

Ground Water

pH in ground water sample was observed at (Project site, Dattawad, Takaliwadi, Herwad) to be in the range 7.0 to 7.5 while conductivity was observed in the range of 1-3 . The value of alkalinity and hardness were observed in the range of 150 -200 mg/l and 400 to 450 mg/l respectively. Whereas heavy metal was found to be within the limit.

Surface Water

There is rivers in the study area is Panchganga River. The sampling locations were selected at 3 different stations of river at a distance of 500m.

Samples were collected and analyzed as per standard methods and frequency of sampling was thrice /station. pH observed to be in the range of 7.3 to 7.5 and conductivity varies from 0.5 – 0.8 mg/l. Chloride and Sulphate were observed to be in the range of 89 to 24 mg/l and from mg/l respectively. The heavy metal contents are found well within the limit.

Noise Environment:

Noise level measurement was carried out at each ambient air quality station and also within the existing plant premises.

The frequency of ambient noise level monitoring and noise level at source were twice/week/station and thrice/station respectively. Ambient noise levels were recorded in following time schedule:

Day time - 6 am to 7 am. 9 am to 10 am.1 pm to 2 pm, 5 pm to 6 pm, 9 pm to 10 pm

Night time - at 10 pm to 6 am.

Location	Day (dB unit)	Night (dB unit)
Project Site	56	44
Herwad	58	40
Takaliwadi	56	40
Abdul lat	59	36
Dattawad	54	35

9.0 PREDICTION AND MITIGATIONOF IMPACTS

9.1 Emissions in air:

When new boiler of 25 TPH will be run the existing boilers will not be required to operate. An estimated 1.35 MT/day of fly ash discharge is expected in air due to boiler operation. As per CPCB standards 800 mg/nm3 limit is prescribed for air emission due to spreader stoker boiler using biofuels like bagasse.

PP proposes to install multicyclone type of dust collector and achieve the prescribed limit of fly ash discharge.

9.2 Water pollution

The industry will utilize latest technology of treatment of spent wash 400 m3/day by recovering biogas and then concentrating followed by burning of spent wash in boiler, thus adopting zero effluent discharge system.

9.3 Noise pollution

Operation of a distillery does not involve any heavy duty impact type of machinery operation hence does not contribute to noise pollution.

Operators in boiler and turbine sections will be required to use personal protective equipments when operating the system.

9.4 Solid waste disposal

When new boiler of 25 TPH will be run the existing boilers will not be required to operate. An estimated 12.15 MT/day of bottom ash discharge is expected in due to boiler operation. This ash will be used by brick manufacturers.

Concentrated dried spent wash will be burnt in the boiler.

10.0 ENVIRONMENT MANAGEMENT PLAN (EMP)

KSPL has drawn an Environment Management Plan (EMP) to conserve the resources, minimize the waste generation, treatment of waste, recovery of by products and recycling of material. It will also take into consideration vegetation and landscaping of open area. and also The post project quality monitoring to ensure and check compliance to proposed mitigation measures and preservation of environmental quality is integral part of EMP.

Management has made following budgetary allocation to ensure EMP is properly implemented and no financial constraints will be allowed.

Budget provision for Environmental Management plan

S. No.	ITEM	Recurring Cost per annum	Capital Cost
1	Air Pollution Control	2.5	20.00
2	Water Pollution Control	5.0	400.00
3	Noise Pollution Control	----	03.00
4	Environment Monitoring and Management	@ 0.45	03.00
5	Occupational Health	@ 1.00	12.00
6	Green Belt	@ 1.00	25.00
7	Salary of EMP staff	6.8	----
8	Safety management.		12.00
9	Laboratory and chemicals	05.0	28.00
10	Maintenance of ETP and wages of workers.	15.0	22.00
	Total	36.75	525.00

The EMP will be carefully designed so as all the affected components/areas have been covered and monitored and mitigated as per requirement during construction and operation of proposed expansion cum modernization.

The following aspects have been covered under EMP:

1	Air Pollution Control	Provision of multicyclones for fly ash collection
2	Water Pollution Control	ETP to ensure zero discharge,STP
3	Water conservation	Recycling of condensate water from distillation and cogeneration
4	Noise Pollution Control	Provision of vibration isolaters, acaustic enclosers
5	Environment Monitoring and Management	Planned monitoring of air, water,noise and soil parameters
6	Occupational Health	Regular health check-up of the workers
7	Green Belt	Tree Plantation
8	Safety management.	Safety measures like ear muffs , gloves, helmet shoes, goggles, aprons to the workers

ENVIRONMENT MANAGEMENT CELL

A separate Environment Management Cell will be established to look after the Effluent Treatment Facility and to monitor and control the environmental quality. This cell would comprise of following members:

Environmental Engineer	-	1 No.
Environmental Chemist	-	1 No.
Laboratory Attendants	-	2 No.
Safety Officer	-	1 No.
Plant Operator	-	3 No.
Supporting Staff	-	02No.

Members of the Environmental Cell would be well qualified and experienced in the concerned field. Some of the routine tests of wastewater such as pH, solids, temperature, etc. will be carried out in the laboratory of distillery. However, for additional tests of water, wastewater, soil, air etc. services of reputed laboratories as well as that of a consultant would be hired.

Conclusion:

- Setting up of a Molasses based distillery unit will be helpful to the industrial development in this region.
- The use of Molasses by the distillery will help the farmers in this region for marketing their products i.e. Sugar Cane and get extra benefits by value addition.
- Molasses generated by neighboring sugar industries will be used for useful financial benefits
- The sale of alcohol will generate large amount of revenue by way of excise duties levied on the local front
- The distillery will also generate direct employment to a large number of local skilled, semi- skilled and unskilled workers. The distillery can also generate revenue for local population by the services that they render to the industry
- The industry will help the farmers for supplying fertilizers, grains and the developed Sugar Cane. Field demonstration to educate the farmers in scientific methods of cultivation of Sugar Cane will be given.
- Industry will help the farmers in various purpose i.e. educational, social institutions, cultural institutions.
- Safety council will be established by the safety officer to take safety steps for employees.

The promoter has selected industrial backward area in Maharashtra state.

It would be advantageous to implement it as quickly as possible in order to improve the socio-economic in the area as it will improve the regional economy.

Since the project is conceived as zero discharge project and self sufficient in its electricity requirement and concerns of environment duly taken care of, it may be recommended for early environmental clearance.