

**SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT
REPORT**

OF

ShriBajrang Chemical Distillery Limited

(proposed Grain based Distillery plant capacity of 2X180 KLPD and 12 MW Co-generation power plant)

at

Bhimbori Village, Berla Tehsil, Bemetara District, Chhattisgarh.

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Chhattisgarh**

1.0 PROJECT DESCRIPTION

ShriBajrang Chemical Distillery Limited is proposed Grain based Distillery plant capacity of 2X180 KLPD and 12 MW Co-generation power plant in Khasara Nos. 468, 469, 470, 471, 472/1, 472/2, 473/1, 473/2, 474, 475, 476, 477/1, 477/2, 478/1, 478/2, 479, 480/1, 480/2, 481, 482/1, 482/2, 483, 484/1, 484/2, 484/3, 484/4, 485, 486, 487, 488, 489, 490, 491, 492/1, 492/2, 493, 494, 495, 496, 497 & 498 of Bhimbori Village Berla Tehsil Bemetara District Chhattisgarh. The total land proposed for the proposed project is 25.36 Ha (62.66 Acres). The total project cost estimated for the proposed project is Rs.325.0 Crores.

The total land proposed for the proposed project is 25.36 Ha (62.66 Acres). Out of this 9.55 Ha land is owned by ShriBajrang Commodity (which is a sister concern unit of our group) and agreement has been entered between ShriBajrang Commodity & ShriBajrang Chemical Distillery Ltd for purchase of said land vide dated 10/04/2021. Agreements of sale under process for most of 4.61 Ha of private land in this regards application has been submitted before state government for its acquisition. 11.2 Ha government land is also involved. An application has been submitted to the Government of Chhattisgarh for allocation of Govt. Land.

As per the Ministry of Environment, Forest & Climate change Notification S.O.1960(E) dated 13th June, 2019, Grain based Distillery plants with capacity More than 200 KLPD are classified under Category 'A'. In order to obtain Environmental Clearance for the proposed Distillery project, Form - 1, proposed TOR along with Pre-Feasibility Report have been submitted to the Ministry of Environment, Forest & Climate Change (MoEF&CC), New Delhi vide proposal no. IA/CG/IND2/209971/2021 date: 22nd April 2021. Subsequently standard TOR letter has been issued vide No. IA-J-11011/186/2021- IA -II (I) dated 04th May, 2021 to our proposed project. The Draft EIA Report has been prepared by incorporating the TOR stipulated by MOEF&CC.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ RA 0149, for preparing EIA report for distillery projects, have prepared Environmental Impact Assessment (EIA) report for the proposed project by incorporating the TOR approved by Ministry of Environment, Forest & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development, etc.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Project site:

Table No. 1.1: Environment Setting within 10 Km. radius of the site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Dry agricultural and Govt. dry land (non-agricultural)
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.3 %; Industrial Area-6.2 %; Tank / River/ Reservoir etc – 9.3 %; Single crop land – 59.1 %; Double Crop Land – 6.9 %; Plantation Area – 4.4 %; Land with scrub – 4.3 %; Land without scrub – 2.9 % & Sheet rock area -2.6 %.
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil within 10 Km radius
4.	Historical places / Places of Tourist importance / Archeological sites	Nil within 10 Km radius
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 th January 2010	None And also the project area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 th July 2019.
6.	Defence Installations	Nil within 10 Km radius
7.	Nearest village	Bhimbori – (0.85 Kms. – SW Direction)
8.	No. of Villages in the Study Area	42 nos.
9.	Forests	Nil within 10 Km radius
10.	Water body	Lornadhi- 3.7 Kms, Ghurinala –3.6 Kms, Kharoon River- 1.9 Kms. & Few seasonal nalas, ponds exist within the study area

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
11.	Nearest Highway	NH#200 – 6.8 Kms.
12.	Nearest Railway Station	Dharsiwarailway station -5.2Kms
13.	Nearest Port facility	Nil within 10 Km. Radius.
14.	Nearest Airport	Nil within 10 Km. Radius
15.	Nearest Interstate Boundary	Nil within 10 Km. Radius
16.	Seismic zone as per IS-1893	Seismic zone – III
17.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
18.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil

1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is the proposed plant configuration and proposed production capacities:

Table No.1.2: Proposed Plant Configuration & Production Capacities

S. NO.	NAME OF UNIT	NAME OF THE PRODUCT	PRODUCTION CAPACITY
1	Distillery plant	Multigrain based distillery to produce Ethanol/RS/ENA/Potable Alcohol/ Industrial alcohol	2X180 KLPD (360 KLPD)
2	Power plant	Co-generation Electricity	12 MW
<u>BY-PRODUCTS</u>			
1	Distillery plant	DDGS	180 TPD
2	Distillery plant	CO ₂ recovery	180 TPD

1.3 RAW MATERIAL REQUIREMENT

The following will be the raw material requirement for the proposed project:

Table No.1.3: Raw Material Requirement, Source & Mode of Transport

S.No	Raw Material	Source	Quantity (TPD)	Method of Transport
Grain Based Distillery plant:				
1	MultiGrains Rice, maize, bajra, jowar, corn, Sorghum grain	Chhattisgarh	864	Through covered trucks by Road

	Waste/damaged broken rice and other starch based grains, etc.)			
	Enzymes	Chhattisgarh	0.8	trucks by Road
	Sodium Hydroxide	Chhattisgarh	0.4	trucks by Road
	Urea	Chhattisgarh	1.8	trucks by Road
	Anti-foam agent	Chhattisgarh	0.2	trucks by Road
	Yeast	Chhattisgarh	0.8	trucks by Road
Fuel (1x80TPH Boiler)				
1.	Biomass	Chhattisgarh	432	Through road by covered trucks
	(or)			
2.	Indian coal	Korba Chhattisgarh	432	Through road by covered trucks

1.4 MANUFACTURING PROCESS

Grain based distillery:

Initially food grains including damaged/ spoilt grains unfit for human consumption will be sent through the milling section to reduce their size, followed by liquefaction which converts starch into simple molecules of dextrin. In the next step, this dextrin undergoes saccharification process and batch fermentation. Then distillation is done through molecular sieve technology to produce rectified spirit/ ENA/ ethanol. 1x80 TPH boiler will be installed to meet the steam requirement for the distillery project and 12 MW power will also be generated from this boiler. Carbon dioxide(Byproduct) produced during fermentation will be recovered by means of a scrubbing arrangement, and the recovered CO₂ will be supplied to soft drink manufactures in cylinders. DDGS(Byproduct) generated Will be sold as cattle feed / fish feed / prawn feed.

1.5 WATER REQUIREMENT

The total water requirement for the proposed project will be 2868KLD. This includes process water, CT make up, DM water for boiler & ENA plant, DM plant regeneration waste water and water for domestic requirement. Water requirement for the proposed project will be sourced from Kharoonriver. Prior permission from the Water Resources Department, Govt. of Chhattisgarh will be obtained before drawing water. The following is the water requirement break up for project is shown in Table below:

Table No.1.4: Water Requirement Breakup

S. NO.	SECTION	WATER CONSUMPTION IN KLPD
1	Process with recycle	830
2	Makeup water for cooling Tower	722
3	Make up water for Boiler	720
4	CIP & washings	160
5	Softener/DM plant	376
6	Domestic	60
	Total	2868

1.6 WASTEWATER GENERATION

The total wastewater generation from the proposed project will be 2729 KLD. This includes spent wash, Boiler Blowdown, Cooling Tower Blowdown, DM plant regeneration and Sanitary wastewater. The following is the wastewater generation breakup of the project is shown in Table below:

Table No.1.5: Breakup of Wastewater Generation

S. NO.	SECTION	WASTEWATER GENERATION IN KLPD
1	Spent wash	2118
2.	Cooling tower blow down from process (Fren + Process)	412
3.	Cooling tower blow down from power plant	36
4.	Boiler blow down water from power plant	65
5.	Filters Backwash & DM plant regeneration	50
6.	Sanitary Wastewater	48
	Total	2729

1.7 WASTEWATER CHARACTERISTICS

The following are the Characteristics of wastewater.

TABLE: 1.6-CHARACTERISTICS OF SPENT WASH(UNTREATED)		
S.N.	PARAMETER	SPENT WASH (GRAINS)
1.	pH	3.8 – 4.1
2.	Total Dissolved Solids(mg/l)	40,000 – 45,000
3.	COD(mg/l)	50,000- 60,000
4.	BOD(mg/l)	24,000-30,000

TABLE: 1.7-CHARACTERISTICS OF NON PROCESS EFFLUENT WASH(UNTREATED)

S.NO.	CHARACTERISTICS	SANITARY WASTE WATER	COOLING TOWER BLOW DOWN	BOILER BLOW DOWN	DM PLANT & SOFTNER REGENERATION WATER
1.	pH	7.0 – 8.5	7.0 – 8.0	9.5 – 10.5	4.0-10.0
2.	T.D.S. (mg/l)	800 – 900	800-1000	800-1000	5000-6000
3.	B.O.D. (mg/l)	200 – 250	---	---	---
4.	C.O.D. (mg/l)	300 – 400	---	---	---

2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 km radius of the project.

2.1 AMBIENT AIR QUALITY

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations including project site during **1st March 2021 to 31st May 2021**. The following are the concentrations of various parameters at the monitoring stations:

TableNo.2.1 : Ambient Air Quality Summary

S.No.	Parameter	Concentration
1.	PM _{2.5}	: 15.1 to 43.3µg/m ³
2.	PM ₁₀	: 25.1 to 72.2µg/m ³
3.	SO ₂	: 6.0 to 16.2µg/m ³
4.	NO _x	: 6.5 to 21.3µg/m ³
5.	CO	: 254 to 1268µg/m ³

2.2 WATER QUALITY

2.2.1 SURFACE WATER QUALITY

Lorunadhi- 3.7 Kms, Ghurinala –3.6 Kms, Kharoon River- 1.9 Kms. & Few seasonal nalas, ponds exist within the study area. 2 no. of surface water samples from Kharoon River i.e. 60 m Uptream & 60 m Down Stream & 6 other surface water samples have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 GROUND WATER QUALITY

8 Nos. of ground water samples from open wells / bore wells have been collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

2.3 NOISE LEVELS

Noise levels were measured at 8 locations during daytime & nighttime. The noise levels at the monitoring stations are ranging from 42.17 dBA to 59.26 dBA.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 PREDICTION OF IMPACTS ON AIR QUALITY

The likely emissions from the proposed project are PM, SO₂, NO_x. The predictions of ground level concentrations have been carried out using Industrial Source Complex model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

It is observed from the computation results that the maximum predicted incremental rise in 24 hourly ground level concentrations of PM, SO₂ & NO_x during operation of the proposed project in the area is shown in below table.

TABLE: 2.2-NET RESULTANT MAXIMUM CONCENTRATIONS DUE PROPOSED PROJECT

ITEM	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (µg/m ³)
Maximum baseline Concentration in the study area	72.2	16.2	21.3	1268
Maximum predicted incremental rise in concentration due to the proposed project	0.09	6.02	0.61	--
Maximum predicted incremental rise in concentration due to the Vehicular Movement	0.45	--	2.98	2.00
Net Resultant concentrations during operation	72.74	22.22	24.89	1270
National Ambient Air Quality Standards	100	80	80	2000

The predicted results show that the net resultant concentration (max. baseline conc. + max. incremental rise in conc.) of PM, SO₂ and NO_x will be well within the National Ambient Air Quality Standards after commissioning of proposed project. Hence there will not be any adverse impact on air environment due to the proposed project.

3.2 PREDICTION OF IMPACTS ON NOISE QUALITY

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. 33 % of extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

3.3 PREDICTION OF IMPACTS ON WATER ENVIRONMENT

The effluent will be treated as per CPCB norms to achieve zero discharge. No effluent will be discharged outside the premises. There will be no contamination of ground water or surface water bodies due to the proposed project. Sanitary waste water will be treated in sewage treatment plant. Water requirement for the proposed project will be sourced from Kharoonriver. Prior permission from the Water Resources Department, Govt. of Chhattisgarh will be obtained before drawing water. Rain water harvesting will be taken up in consultation with the State Ground Water Board to conserve the precious water. Hence there will not be any adverse impact on water environment due to the proposed project.

3.4 PREDICTION OF IMPACTS ON LAND ENVIRONMENT

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms. 33 % of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

3.5 SOCIO - ECONOMIC ENVIRONMENT

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Developmental activities will be taken up in consultation with village panchayat. Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

TABLE NO.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.NO	PARTICULARS	FREQUENCY OF MONITORING	DURATION OF SAMPLING	PARAMETERS TO BE MONITORED
1. Water quality				
a)	Industrial effluents.	Online	continuous	pH, EC, TDS, BOD, COD, Cl, SS, Sulphates
b)	Ground water quality (Peizometric wells around spent wash storage area, ETP)	Once in a month	Grab sampling	As per BIS: 10500
2. Air Quality				
a)	Stack Monitoring	Continuous online monitoring		PM
		Once in a month		SO ₂ &NO _x
b)	Ambient air quality	AAQMS	24 hours continuously	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x & CO
3. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, relative humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	Ambient noise levels	Twice in a year	Continuous for 24 hours with 1 hour interval	

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 AIR ENVIRONMENT

The steam requirement for the proposed distillery project will be met from the 1x80 TPH boiler which will be operated with coal/biomass as fuel. The emissions of concern are Particulate Matter (PM), Sulphur dioxide (SO₂) and Nitrogen oxides (NO_x). A stack height of 77 m will be provided to 80 TPH boiler for effective dispersion of sulphur dioxide emissions into the atmosphere. In the proposed boiler ESP will be provided for effective treatment of flue gases from the boilers to bring down the suspended particulate matter concentration in the exhaust gases to less than 50 mg/Nm³. The boiler and the ESP will be interlocked in such a way that in case the ESP fails, the fuel feeding to the boiler will stop. The net resultants GLCs are within the National Ambient Air Quality Standards. Hence there will not be any adverse impact on air environment due to the proposed project.

7.2 WATER ENVIRONMENT

GRAIN BASED DISTILLERY:

As per CPCB recommendations the spent wash quantity will be restricted to less than 6 KL/KL of R.S. for Grain based distillery by adopting fermentation technology. The Maximum Spent wash from the 2x180 KLPD Distillery plant will be 2118 KL/day.

DECANTATION OF SPENT WASH:

Spent wash from mash column bottom will be fed to decanter centrifuge after cooling in fermented mash pre-heater. The decanter concentrates the solids present in the spent mash to desired level. The wet cake will be separated in decanter at 30% solids. This wet cake will be mixed with concentrated Thin slop for further concentrating in Dryer.

EVAPORATION PROCESS:

The objective of Evaporation is to concentrate a solution consisting of a volatile solute and a volatile solvent. Evaporation is conducted by vaporizing a portion of the solvent to produce a concentrated solution of thick liquor with 30% solids and 70 % moisture content. The evaporation system consists of Evaporators connected, in series. The spent wash will be pumped from distillation section, which will be fed to the evaporator by using feed pump. Gas Liquid separator (5 Nos.) will be used to separate the vapor and liquid. Both Vapor & Spent wash will be fed to the next evaporation effect so it is called as Feed Forward Effect Evaporation. The vapor from last evaporator will be condensed in condenser and transferred to the dryer while the condensate from the evaporators is first

utilized for heat recovery. While vacuum pump maintains vacuum in the entire system. Product final thin slop with 30% solids will be transferred to the drying system where it is further concentrated to 90 % solids. The condensate from evaporation will be recycled.

DRYING PROCESS:

The wet cake from the Decanter and the concentrated syrup with 30% solids from the Evaporator will be dried in a steam tube bundle dryer to produce DDGS with 10% moisture and 90% solids, which will be sold as cattle feed. It is totally a zero discharge process, which is in accordance with the CREP recommendations.

Zero discharge will be implemented as per CREP recommendations. Scheme for Zero Discharge System (ETP) For Grain Based Distilleries:

NON-PROCESS EFFLUENT TREATMENT & DISPOSAL:

Spent lees & condensate will be treated in Condensate Polishing Unit (CPU). Non-process effluents like DM plant regeneration water & boiler blow down will be neutralized in neutralization tank and will be mixed with Cooling tower blow down. This treated effluent after ensuring compliance with standards stipulated by CECB for wastewater for onland for irrigation, will be utilized for internal greenbelt development, dust suppression, ash conditioning after ensuring compliance with CPCB/CECB standards. The scrubbed water from CO₂ Scrubber will be consumed in the Fermentation section.

SANITARY WASTEWATER AND DISPOSAL :

The sanitary wastewater generated from the project will be 48 KLD, which will be treated in Sewage treatment plant capacity of 50 KLD.

7.3 NOISE ENVIRONMENT

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided to STG & DG sets. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

7.4LAND ENVIRONMENT

All the required air pollution control systems will be provided to comply with CPCB / CECB norms. The effluent generated from the proposed project will be treated to comply with the CPCB / CECB. All solid wastes will be disposed / utilized as per CPCB / CECB norms. 33% of greenbelt will be developed as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed project.

Table No.7.1: Solid Waste Generation and Disposal

S.NO.	SOLID WASTE	TOTAL QUANTITY (TPD)	DISPOSAL
1.	DDGS	180	Will be sold as cattlefeed / fish feed / prawn feed
2.	Boiler ash	173	Ash generated will be given to M/s. RIGID FLY ASH BLOCK and M/s. U.K. BRICKS for utilisation of fly ash for making bricks in their existing plant.
	when 100% Indian coal is used		
	when 100% biomass	73	(or) Will be given to farmers to use in the agriculture filed.

7.5GREENBELT DEVELOPMENT

Greenbelt development will further enhance the environment quality through limitation of air emissions, attenuation of noise levels, balancing eco environment, prevention of soil erosion and creation of aesthetic environment. 33 % of greenbelt will be developed in the plant premises as per CPCB norms.

7.6COST FOR ENVIRONMENT PROTECTION

Capital Cost for Environment Protection for proposed project : Rs. 40.5Crores.

Recurring Cost per annum for Environmental protection : Rs. 2.025Crores.