
**SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

OF

E.I.D PARRY (INDIA) LTD.

Expansion of Integrated Sugar Complex

Nagaral and Nainegali Village,
Bagalkot Taluk, Bagalkot District,
Karnataka.

SUBMITTED TO

KARNATAKA STATE POLLUTION CONTROL BOARD

1.0 PROJECT DESCRIPTION

E.I.D Parry (India) Limited is an existing operating integrated Sugar Complex consisting of 4750 TCD Sugar, 15 MW Co-gen power at Nagara and Nainegali Village, Bagalkot Taluk, Bagalkot District, Karnataka. .

Now the company has proposed to enhance the capacity of Sugar unit from 4750 TCD to 7500 TCD, Co-gen power from 15 MW to 34 MW and install new Distillery unit of 60 KLPD capacity. Along with this, company has proposed to install Concentrated spent wash incineration boiler to generate 3 MW power. This proposed expansion will be taken up in the existing plant premises of 177.2 acres. The cost of the proposed expansion Project will be Rs. 351 Crores. (Survey no.s - 29, 32/1, 32/2, 33/1/B, 33/1A, 36, 27/2, 27/3,28/1, 28/2, 29/1, 30/6, 30/3, 30/4b, 30/4a, 30/4c, 30/5a, 30/5b, 33/2a, 35/2, 36/1b, 36/2, 48/1a, 48/1b/1, 39/1, 36/3, 62/1a, 3/3 + 4/1, 30/1+2, 39/2b, 43/1+2/c, 43/1, 135/1)

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India for conducting EIA studies, have prepared Draft Environmental Impact Assessment (DEIA) report for the proposed expansion project by incorporating the Terms Of Reference issued by MOEF.

- a. Detailed characterization of status of environment in the area of 10 km. radius from the proposed site for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- b. Assessment of air emissions, liquid waste and solid waste from the proposed expansion project along with the noise level assessment.
- c. Environmental Management Plan (EMP) consisting of Air emission management, waste water management, Noise level management, solid waste management, etc.
- d. Post expansion project monitoring plan

1.1 SITE DETAILS

- The Plant area does not fall under the industrial areas / cluster, which are listed in MoEF office memorandum dated 13th January 2010.
- Nearest Habitation is Naingeli village at a distance of 1.6 Kms. from the plant site.
- There are no National Parks / Wild life Sanctuaries / biosphere reserves within 10 Km radius of the plant.
- No historical places and places of tourist importance within 10 Km radius of the plant.
- Two Reserve forest are present at a distance of 4.5 Kms. & 7.5 Kms. respectively within 10 Km. radius of the plant site.
- Krishna River is flowing at a distance of 2.7 Kms. from the plant site
- Almatti Dam is present at a distance of 7.0 Kms. from the plant site.
- No R & R is involved.

- No litigation pending against the project and / or any direction / order passed by any Court of Law.
- There are no Distillery units within the study area of 10 Km radius

1.2 RAW MATERIALS

The following are the raw materials and their requirement for existing and expansion project

S.NO	RAW MATERIAL	SOURCE	QUANTITY (TPD)			METHOD OF TRANSPORT
			Existing	Expansion	Total	
Sugar plant :						
1	Sugar Cane	Local area	4750	2750	7500	By trucks, tractors& bullock carts
2	Lime	Local area	11.875	6.875	18.75	Through covered trucks by Road
3	Sulphur	Local area	3.325	1.925	5.25	Through covered trucks by Road
4	Phosphoric Acid	Local area	0.285	0.165	0.45	Through covered trucks by Road
Co-gen power plant :						
1	Fuel					
	Bagasse	From Sugar plant	1050	1200	2250	Conveyor
			or			
	Coal	Imported	395	495	890	By Sea/ Rail/Road Covered trucks
Distillery :						
1	Molasses	From Sugar plant	--	230	230	Through Pipeline/Tanker
2.	Fuel for Incineration Boiler					
	Concentrated Spent wash	From Distillery Unit	--	120	120	Through Pipeline
	Coal		--	60	60	Conveyor

1.3 MANUFACTURING PROCESS

A) Sugar

The Sugar cane is received from the farmlands through trucks, weighed and unloaded in the cane carrier and passed through Whole cane shredder. The shredder improves extraction of juice in milling. The magasse coming out of mill is de-watered with the help of two de-watering mills to bring down the moisture to about 48-50% enabling it to be fed to the boiler for steam generation. The steam generated from co-gen boiler is passed through turbines and in turn power is generated. Emerging out low pressure steam is utilized in the process section.

Extracted cane juice from milling is heated to 70 - 75 °C and treated with Lime and sulphur dioxide gas to separate impurities. The clear settled juice is sent to the Evaporators to evaporate the water and convert it into syrup.

The syrup is further boiled in Pan and sugar crystals are formed in it. High speed centrifugal machines used to separate the sugar crystals and molasses, from the syrup. This molasses will be utilized as raw material in distillery to produce alcohol. The separated sugar is dried and then subjected to further refining in the Refining House to get refined sugar. The refined sugar is marketed in 50 and 100 Kg. bags as per the requirements.

B) Co-generation Power Plant

The power plant consists of the following.

- 110 TPH Traveling Grate Boiler with ESP
- 1 x 19 MW Triple Extraction cum condensing type Steam turbine
- Mechanical auxiliaries like Fuel handling system.
- Water cooled condenser system.
- Electrical auxiliaries

The boiler will be designed to operate with bagasse / imported coal as fuel.

The whole process comprises of generating heat energy in the boiler and then converting heat energy generated in the Travelling Grate Boiler into Mechanical energy in the turbine and further converting this mechanical energy generated in the turbine into electrical energy in the alternator.

C) Rectified Spirit / ENA / Ethanol

The rectified spirit will be manufactured by Yeast propagation, Fermentation and Distillation processes. Continuous fermentation with yeast recycling will be adopted in the distillery plant. The spent wash generation will be restricted to 8 Kl/Kl of spirit production. The spent wash will be concentrated to 60% solids in Multiple Effect Evaporators and incinerated in boiler of 25 TPH capacity. Ethanol will be produced from Rectified Spirit through dehydration process by using Molecular Sieve technology.

1.4 WATER ENVIRONMENT

Water requirement for the existing Plant is being met from the Krishna River. For the proposed expansion also, water required will be met from the Krishna River.

Prior permission from Irrigation Department has already been obtained.

WATER REQUIREMENT FOR SUGAR & CO-GEN POWER PLANT

WATER CONSUMPTION (in KLD)					
Section	Sugar		Co-gen		Total after proposed expansion
	Existing (4750 TCD)	Additional Expansion (2750 TCD)	Existing (15 MW)	Additional Expansion (19 MW)	
a) Domestic	10	10	10	10	40
b) Industrial purpose					
1. Process water	17	10	--	--	27
2. Boiler feed			234	270	504
3. DM plant regeneration			30	40	70
4. Cooling water make up			89	100	189
5. Service water			10	10	20
Total	27	20	373	430	850

WATER REQUIREMENT FOR DISTILLERY PLANT

SECTION	Water requirement
Process water	420
Make up water for Boiler	40
DM water for R.S dilution	56
Cooling tower make up	60
DM plant regeneration	15
Domestic	10
Total	601

Water requirement for Sugar (Existing) : 27 KLD

Water requirement for Sugar (Expansion) : 24 KLD

Water requirement for Co-gen power (existing) : 373 KLD

Water requirement for Co-gen power (expansion) : 430 KLD

Water requirement for Distillery : 601 KLD

Total water requirement for after proposed expansion will be : 1451 cum/day

1.5 WASTE WATER GENERATION AND CHARACTERISTICS

Waste water generation from the existing Integrated Sugar Plant 552 KLD. Waste water generation from the proposed expansion of Integrated Sugar Plant will be 876 KLD. Hence total waste water generation after proposed expansion will be 1428 KLD.

WASTE WATER GENERATION FROM SUGAR & CO-GEN POWER PLANT

SECTION	SUGAR		CO-GEN		Total after proposed expansion
	Existing (4750 TCD)	Additional Expansion (2750 TCD)	Existing (15 MW)	Additional Expansion (19 MW)	
a) Domestic	8	8	8	8	32
b) Industrial purpose					
Process & Washings	84	48	--	--	132
Boiler Blow down	--	--	24	28	52
Tube cleaning	218	122	--	--	340
DM plant regeneration	--	--	30	40	70
Cooling tower blow down	160	92	10	11	273
Service water	--	--	10	10	10
Total	470	270	82	97	919

WASTE WATER GENERATION FROM DISTILLERY PLANT

SECTION	Waste water generation (KLD)
Spent wash	470
Cooling tower blow down	7
Boiler blow down	9
DM water regeneration	15
Domestic water	8
Total	509

Waste water generation from Sugar (Existing) : 470 KLD

Waste water generation from Sugar (Expansion) : 270 KLD

Waste water generation from Co-gen power (existing) : 82 KLD

Waste water generation from Co-gen power (expansion) : 97 KLD

Waste water generation from Distillery : 509 KLD

Total waste water generation for after proposed expansion will be: 1428 KLD

EFFLUENT CHARACTERISTICS

The characteristics of Spent wash, DM plant regeneration water, cooling tower blow down, boiler blow down and sanitary waste water are shown below.

CHARACTERISTICS OF SPENT WASH

S. NO.	PARAMETER	UNIT	CONCENTRATION
1.	pH		4.2 – 4.8
2.	Total Dissolved Solids	mg/l	80,000-1,00,000
3.	COD	mg/l	70,000–1,20,000
4.	BOD	mg/l	45,000 – 55,000

CHARACTERISTICS OF SUGAR PLANT EFFLUENT

PARAMETER	CHARACTERISTICS OF WASTE WATER FROM SUGAR PLANT
pH	5.0-5.5
Total Dissolved Solids(mg/l)	2500
COD(mg/l)	3500
BOD(mg/l)	700

CHARACTERISTICS OF SANITARY WASTE, COOLING TOWER BLOWDOWN, BOILER BLOWDOWN, DM PLANT REGENERATION WATER

S.NO.	CHARACTERISTICS	SANITARY WASTE WATER	COOLING TOWER BLOW DOWN	BOILER BLOW DOWN	DM PLANT 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 -1 000	1000	8000-15000
3.	B.O.D. (mg/l)	200 – 250	-----	-----	-----
4.	C.O.D. (mg/l)	300 – 400	-----	-----	-----

1.6 EFFLUENT TREATMENT PROCESS

A) Sugar Plant

The effluent from Sugar plant will be treated in Oil & Grease trap, Equalization tank, neutralization tank, Primary clarifier, UASB anaerobic digester, Aeration tank, Secondary clarifier and Sludge drying beds. Treated effluent will be utilized for greenbelt development after ensuring quality of treated effluent with standards stipulated for onland for irrigation by CPCB / KSPCB.

B) Co-generation Power Plant

Cooling tower blowdown and DM plant regeneration water will be recycled into process. Boiler blowdown and service water effluent will be treated in neutralization tank and treated effluent is will be utilized for greenbelt development / ash conditioning / dust suppression in the plant premises after ensuring quality of treated effluent with standards stipulated for onland for irrigation by CPCB / KSPCB

C) Distillery

Spent wash generation will be 470 cum/day which will be treated in multiple effect evaporators to concentrate the solids to 60 % and then will be sent to 25 TPH boiler for incineration. This is totally a zero discharge based technology. This technology is approved by CPCB.

The condensate generated during the process of Multiple Effective Evaporators will be reused in the Process thus decreasing the net water requirement.

1.7 AIR EMISSIONS

There will be two stacks connected to the 110 TPH and 25 TPH boilers in the proposed expansion project. The fuel for the 110 TPH boiler will be Bagasse / Coal and 25 TPH boiler will be Concentrated Spent wash. The air emissions of concern from the plant will be PM, SO₂ and NO_x. Electrostatic Precipitator will be provided to 110 TPH boiler and Bagfilters for 25 TPH Boiler to bring down the particulate emission in the exhaust of the boiler to less than 50 mg/Nm³. A stack of 86 m & 55 m height will be provided to 110 TPH and 25 TPH Boilers respectively for effective dispersion of emissions into the atmosphere.

2.0 DESCRIPTION OF ENVIRONMENT

Baseline data has been collected on ambient air quality, water quality, noise levels, flora & fauna and socio-economic details of the people within 10 km. radius of the Plant site.

2.1 AMBIENT AIR QUALITY

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations for one season as per MOEF guidelines. The following are the concentrations of various parameters at all the monitoring stations.

Particulate matter (PM _{2.5})	-	23.5 to 39.9 µg/m ³
Particulate matter (PM ₁₀)	-	39.3 to 66.4 µg/m ³
Sulphur Dioxide (SO ₂)	-	11.9 to 16.9 µg/m ³
Nitrogen Oxide (NO _x)	-	12.1 to 19.2 µg/m ³
Carbon Monoxide (CO)	-	410 to 610 µg/m ³

2.2 WATER QUALITY

Ground water samples were collected at 8 locations and analyzed for various physico – chemical & Bacteriological parameters. The water sample shows that they are suitable for potable purpose except Rampur, Bodnaikdinni & Gulbal tanda village water samples.

2.3 NOISE LEVELS

Noise levels were measured at 8 stations during day time & night time. The noise levels at the monitoring stations are ranging from 49.38 dBA to 54.86 dBA.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 PREDICTION OF IMPACTS ON AIR QUALITY

The emissions of concern from the boiler of the Integrated Sugar Complex will be PM₁₀, SO₂ and NO_x. For the purpose of prediction of Ground Level Concentrations the emissions from the existing and expansion boilers are considered. Industrial Source Complex (ISC-3) software is applied for prediction of GLCs.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO THE EXPANSION 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	66.4	16.9	19.2	610
Maximum predicted incremental rise in concentration due to existing and proposed expansion project	1.3	25.2	6.3	--
Maximum predicted incremental rise in concentration due to vehicular emissions from existing and proposed expansion project	1.2	--	8.6	5.5
Net Resultant concentration	68.9	42.1	34.1	615.5
National Ambient Air Quality Standards	100	80	80	2000

The predicted results show that the incremental rise over the existing baseline status of ambient air quality will be within the revised National Ambient Air Quality Standards for residential areas even after commissioning of the proposed expansion project.

3.2 PREDICTION OF IMPACTS ON NOISE QUALITY

The major noise generating sources will be Turbo generator, Boiler, Compressors & DG set. The Ambient Noise levels will not exceed the standards prescribed by MOE&F, GOI vide Notification under the Noise pollution (regulation & control) Rules, less than 75 dBA during day time and less than 70 dBA during night time. Extensive greenbelt developed will further mitigate the noise levels.

3.3 PREDICTION IMPACTS ON WATER QUALITY

The effluent generated from Sugar, Co-gen and Distillery 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 expansion project.

Ground water will not be used for the proposed expansion. Hence no ground water depletion due to the proposed project. Rain water harvesting will be taken up in consultation with the State Ground water Board to conserve the precious water.

3.4 PREDICTION OF IMPACTS ON BIOLOGICAL ENVIRONMENT

There are no rare & endangered species in the area. All the required pollution control systems will be installed and operated to comply with the norms. Once all the norms are complied with, then there will not be any adverse impact on flora, fauna due to the proposed expansion project.

4.0. ENVIRONMENTAL MONITORING PROGRAMME

Ambient Air Quality, Sack monitoring & effluent analysis will be carried out regularly as per CPCB norms and the analysis reports will be submitted to Ministry of Environment & Forest, Bengaluru & Karnataka State Pollution Control Board regularly. Online monitors will be installed to the stack.

5.0. ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed expansion project. Hence no R & R study has been carried out.

6.0. PROJECT BENEFITS

With the establishment of the proposed expansion 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 expansion project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

7.0 ENVIRONMENTAL MANAGEMENT PLAN

7.1 AIR ENVIRONMENT

There will be two stacks connected to the 110 TPH and 25 TPH boilers in the proposed expansion project. The fuel for the 110 TPH boiler will be Bagasse / coal and 25 TPH boiler will be Concentrated Spent wash. The air emissions of concern from the plant will be PM, SO₂ and NO_x. Electrostatic Precipitator will be provided to 110TPH boiler and Bagfilters for 25 TPH Boiler to bring down the particulate emission in the exhaust of the boiler to less than 50 mg/Nm³. A stack of 86 m & 55 m height will be provided to 110 TPH and 25 TPH Boilers respectively for effective dispersion of emissions into the atmosphere.

7.2 WATER ENVIRONMENT

A) Sugar Plant

The effluent from Sugar plant will be treated in Oil & Grease trap, Equalization tank, neutralization tank, Primary clarifier, UASB anaerobic digester, Aeration tank, Secondary clarifier and Sludge drying beds. Treated effluent will be utilized for greenbelt development after ensuring quality of treated effluent with standards stipulated for onland for irrigation by CPCB / KSPCB.

B) Co-generation Power Plant

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C) Distillery

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The condensate generated during the process of Multiple Effective Evaporators will be reused in the Process thus decreasing the net water requirement.

7.3 SOLID WASTE GENERATION & DISPOSAL

The following table shows the generation & disposal of Solid Waste.

S.No	Solid waste	Quantity (TPD)			Disposal
		Existing	Expansion	Total	
Sugar Plant					
1.	Bagasse	1425	825	2250	Will be used as fuel in Co-gen Boiler
2.	Molasses	213.75	123.75	337.5	Will be used in the proposed Distillery
3.	Filter cake	190	110	300	Will be given to the farmers to use as manure in the Agricultural fields
4.	ETP Sludge	0.19	0.11	0.3	Will be used as manure
Cogeneration Power plant					
5.	When Bagasse used as fuel in Boiler	21	24	45	Will be disposed to farmers to use as manure in Agricultural lands
6.	When Coal used as fuel in Boiler	31.6	39.6	71.2	Will be given to cement plants/brick manufactures

Distillery					
6.	Yeast Sludge	-	2.2	2.2	Mixed with spent wash and incinerated in the boiler.
7.	When concentrated spent wash used as fuel in Boiler	--	3.5	3.5	Ash generated will be given to Group fertilizer unit

7.4 NOISE ENVIRONMENT

The major noise source in the proposed expansion project will be Turbo Generator, Boiler, Compressors & DG set. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt developed around the plant will also help in attenuating the noise levels further. Noise barriers in the form of trees will be grown around the administrative block, ETP and other utility buildings.

7.5 LAND ENVIRONMENT

The effluent generated from the proposed expansion project will be treated to comply with the Karnataka State Pollution Control Board's standards. All the solid waste will be disposed as per norms. Hence there will not be any adverse impact on land environment due to the proposed expansion project.

7.6 GREENBELT DEVELOPMENT

Green belt 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. 60 acres of greenbelt will be developed in the plant premises as per CPCB norms.