

Report on Amendment of Capacities of Proposed Brownfield Expansion (CFG-3) Project

Chambal Fertilisers and Chemicals Limited

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1. INTRODUCTION

1.1. Company Profile

1. Chambal Fertilisers and Chemicals Limited (CFCL) is flagship company of Zuari-Chambal, part of K.K. Birla group, having 2 plants (Gadepan - I & II) manufacturing nitrogenous fertiliser at Gadepan, Kota. CFCL is one of the ten gas based nitrogenous fertilizer projects, set up in the country to meet the growing demand of the green revolution. CFCL is the largest private sector fertilizer complex in India with total (Gadepan - I & II plants) re-assessed capacity of 864,600 tons of urea per annum of each plant. Both Gadepan-I & II plants represent a total investment of over Rs. 2,500 Crores. The total land acquired at Gadepan is about 1060 acres.
2. Gadepan-I plants were commissioned in December 1993 and its commercial production commenced in January 1994. Commercial production of Gadepan-II plants started in October 1999.
3. In the year 2008, CFCL had planned expansion of its fertilizer manufacturing facilities at Gadepan, Kota (Rajasthan) by installing a Ammonia Plant Capacity – 690,000 MTPA, Urea Plant Capacity - 1,200,000 MTPA, Power Generation Unit - 18 MWh and upgrading existing utilities and other off site facilities for the proposed expansion project.
4. The Ministry of Environment and Forests (MoEF) has accorded environmental clearance to the brownfield expansion project (CFG-3) vide letter F. No. J-11011/664/2008-IA II (I) dated April 22, 2010 with the following capacities:
 - ◆ Ammonia Plant : 690,000 MTPA (2000 MTPD on 345 days basis)
 - ◆ Urea Plant : 1,200,000 MTPA (3500 MTPD on 345 days basis)
 - ◆ Heat Recovery Steam Generator (HRSG) : 60 TPH
 - ◆ Captive Power Generation : 18 MW

1.2. Need for Amendment in the Production Capacities

5. Currently CFCL is working to receive Lumpsum turnkey (LSTK) bids from international LSTK/EPC bidders for CFG3 Ammonia/Urea plants. During discussions on technical bid, ammonia technology suppliers offer 2200 MTPD ammonia plant as offered to all other Indian projects recently. 2200 MTPD ammonia plant size is the most economic available capacity.

6. 2200 MTPD ammonia plant shall yield CO₂ sufficient to produce 3850 MTPD Urea. Since 3850 MTPD Urea plant in single train configuration does not have any operating reference, CFCL proposes to select proven 2000 MTPD Urea train x 2 trains configuration.
7. 2 train urea plant configuration shall additionally facilitate compliance to MoEF specific Condition No. xiii suggesting no addition of new ammonia storage tank in its brownfield expansion plant.
8. Accordingly, to have economic plant capacities from licensors, CFCL is requesting to amend the proposed CFG-3 plant capacities as follows:
 - ◆ Ammonia Plant: 803,000 MTPA (2200 MTPD on 365 days¹ basis)
 - ◆ Urea Plant : 1,460,000 MTPA (4000 MTPD on 365 days¹ basis)
 - ◆ Heat Recovery Steam Generator (HRSG) : 100 TPH²
 - ◆ Captive Power Generation : 18 MW

¹ Based on 2-year operation basis, plant shutdown will be taken in 2nd year

² This is required to meet plant startup steam requirements. During normal operations, steam generation may be around 60-70 TPH only.

1.3. Cost of Project

9. The estimated cost for the proposed project was approximately **Rs. 4,000 Crores**. Due to the amendment of the capacities, the total project cost will remain unchanged.

2. PROJECT DESCRIPTION

2.1. Prologue

10. The project is located at Gadepan, 35 km East of Kota city (Rajasthan), at approximately 76°11' E longitude and 25°08' N latitude. The location map for the plant is presented in **Figure 2.1**. The plant complex is located in an area of about 400 Hectares. National highways NH-76 passes along the complex on its northern side. Bina – Kota section of railway line is about 1 km on its northern side. Nearest Airport is at Kota.
11. Each section of CFCL complex has been performing very well right from the inception. Considering the consistent good performance of the plant & in order to improve further, CFCL has completed debottlenecking project to increase the capacity of existing plants. In view of acute shortage of nitrogenous fertilizer in the country and heavy imports of urea, company is considering expanding their existing capacities at Gadepan to produce additional **1.46 Million Ton** Prilled urea annually through a brown field expansion Project (CFG3).
12. CFCL plant occupies a total area of 400 hectare. Existing constructed area include main plants, area for proposed expansion, Storages/ ware houses, Effluent Treatment Plant, plant office, township and green belt etc. Plant layout is shown in **Figure 2.2**.

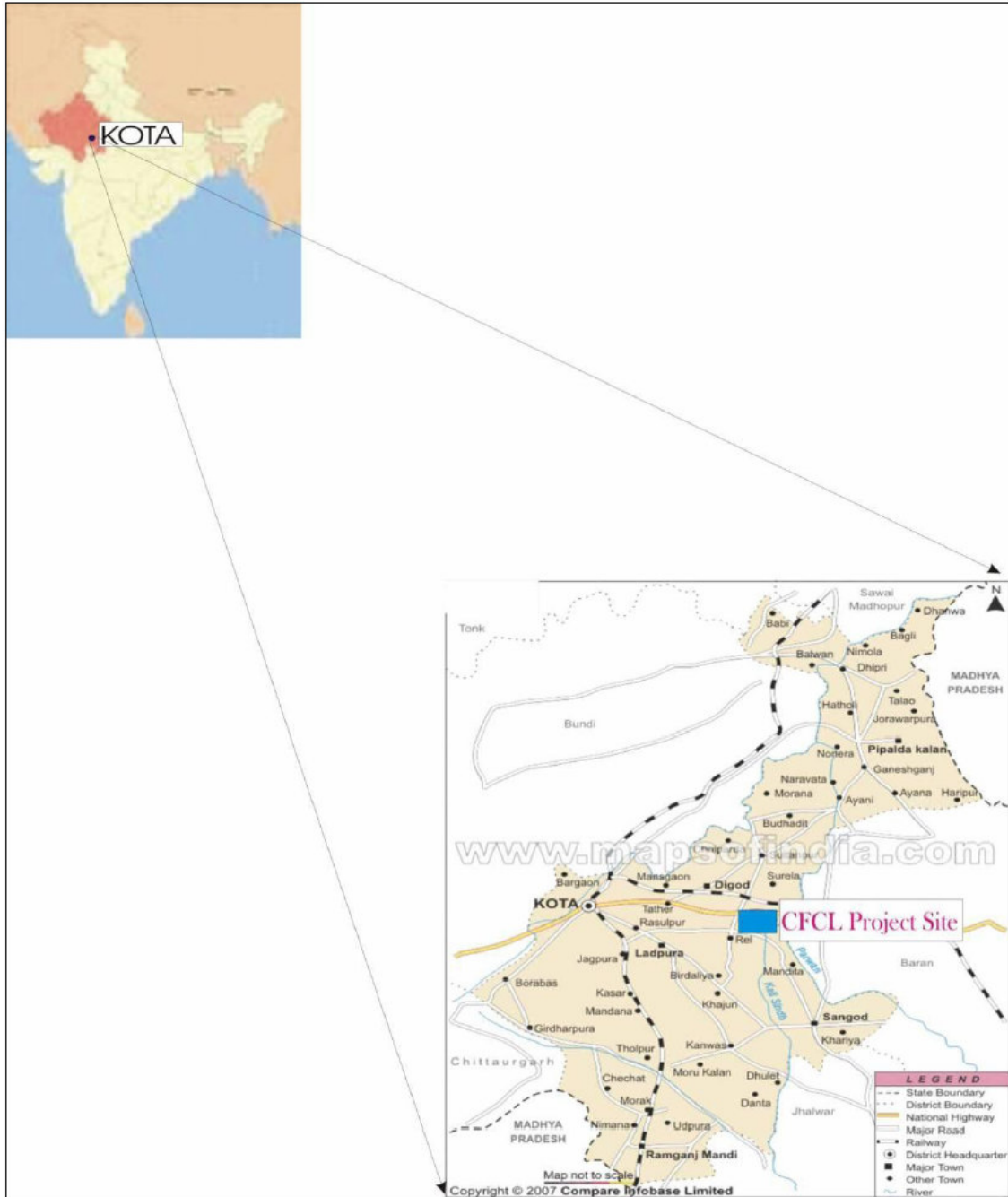


Figure 2.1 : Project Location Map

Report on Amendment of Capacities of Proposed Brownfield Expansion Project (CFG-3) by
M/s Chambal Fertilisers and Chemicals Limited, Gadepan, Kota (Rajasthan)

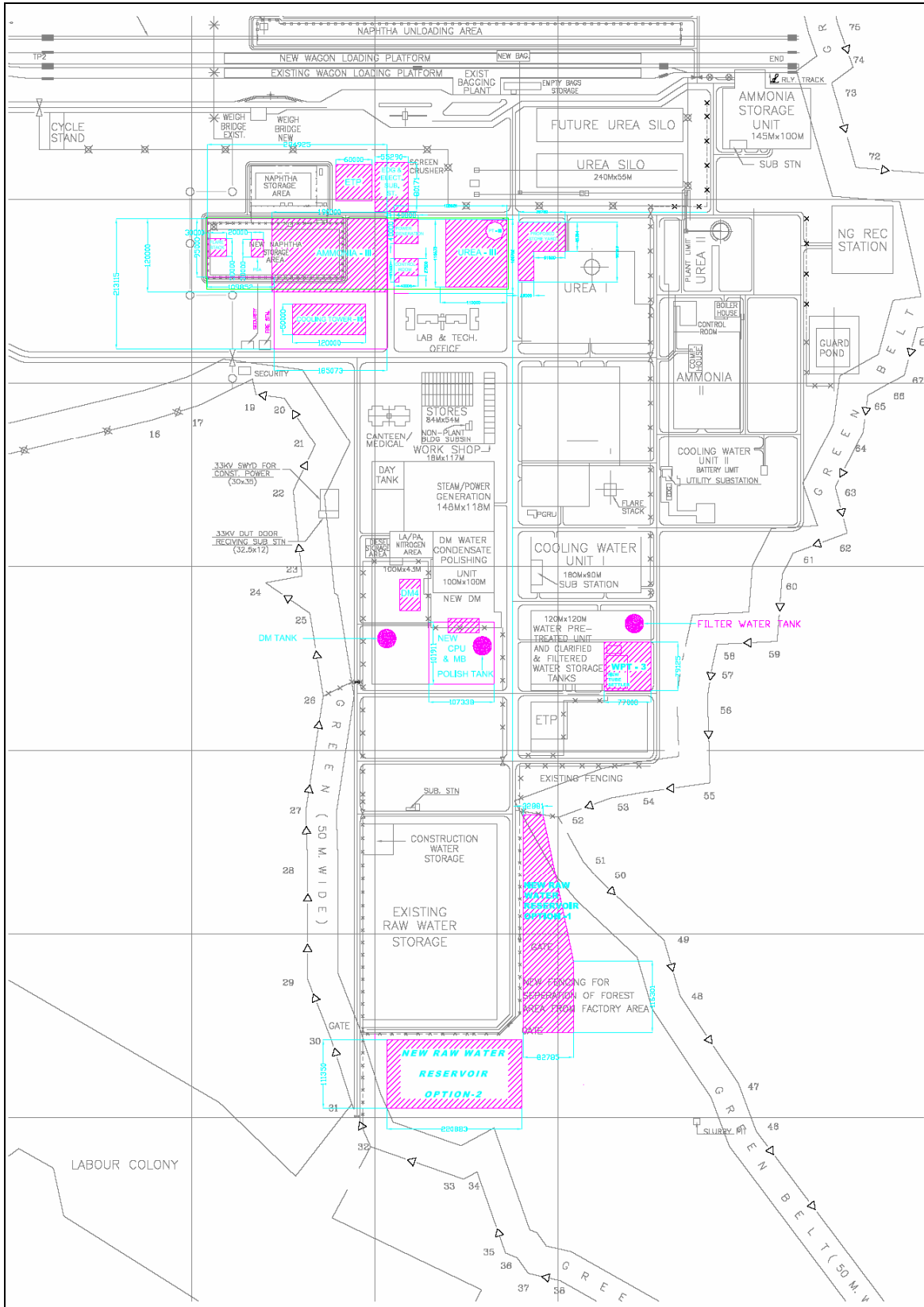


Figure 2.2 : CFCL Plant showing Expansion Areas for CFG-3

2.2. Basic Requirements of the Project

2.2.1. Land

13. The total land available with CFCL is about 400 ha, out of which 6.4 ha land will be utilized for the proposed CFG-3 Plant within the fertilizer complex. No additional land is required for the proposed brownfield expansion even after the capacity enhancement. The area distribution is given below in **Table 2.1**.

Table 2.1 : Land Distribution of the CFCL Complex

S. No.	Particulars	Area (in Ha)
1.	Existing Plant Facilities	180.6
2.	Greenbelt, Landscaping & Township	213.0
3.	Proposed CFG-3 Plant	6.4
	Total	400

2.2.2. Water Requirement

14. Total water requirement for the proposed CFG-3 project will be 754 m³/hr, which will be met through fresh water intake (554 m³/hr) from River Kali-Sindh and recycling & reuse of treated effluent (200 m³/hr). **Due to amendment of capacities, there would not be any increase in the water requirement.** CFCL has got approval to draw 20 cusecs of water from Kali-Sindh river. With the installation of RO unit of suitable size to treat the effluents from CFG -3 and recycle back into system CFG-3 will not require drawl of any additional water (more than the sanctioned limit) from Kali-Sindh river.

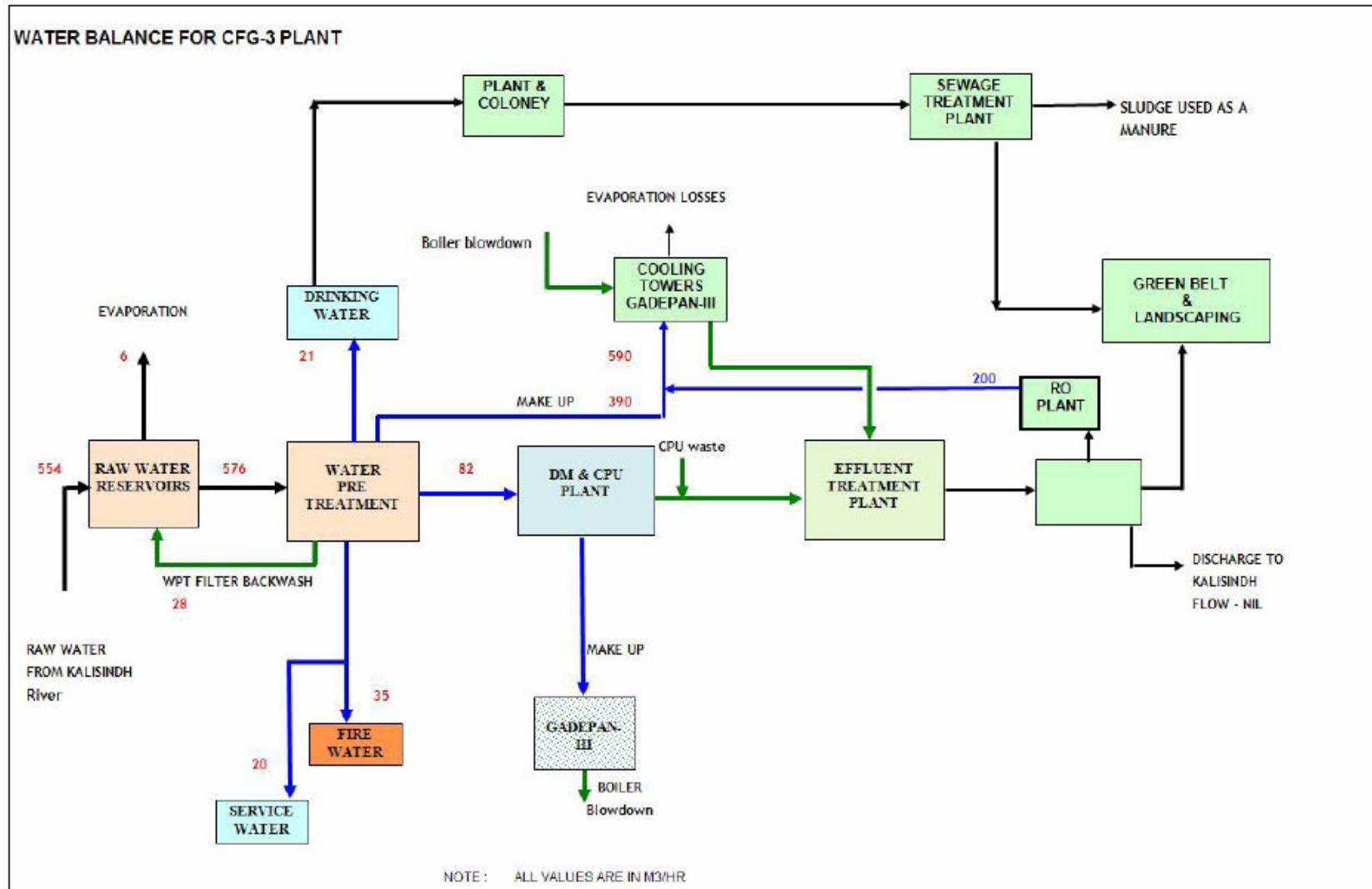


Figure 2.3 : Water Balance Diagram of Proposed CFG-3 Plant

2.2.3. Comparison of Present and Revised Configurations

S. No.	Description	Present Configuration			Revised Configuration		
		Daily Capacity (MT)	Days of Operation	Annual Capacity (MT)	Daily Capacity (MT)	Days of Operation	Annual Capacity (MT)
1.	Ammonia Plant	2000	345	690,000	2200	365	803,000
2.	Urea Plant	3500 (Single Train)	345	1,200,000	4000 (2 Trains)	365 (shutdown shall be taken in 2 nd year)	1,460,000
3.	Captive Power Plant	18 MWh			18 MWh (no change)		
4.	Heat Recovery Steam Generator	60 TPH			100 TPH (This is required to meet plant startup steam requirements. During normal operations, steam generation may be around 60-70 TPH only)		
5.	Raw Water Requirement	754 m3/hr (554 m3/hr from Kalisindh River and 200 m3/hr from effluent recycling unit)			754 m3/hr (No Change) (554 m3/hr from Kalisindh River and 200 m3/hr from effluent recycling unit)		

2.3. Changes in Air Emissions due to Capacity Revision

15. There are three key point sources of air emission from the CFG-3 plant, which are from prilling tower stack, reformer stack and HRSG+GT stack. The details of emission from each of the stack as per the initial assessment and due to revision in capacity have been presented in the following sections:

2.3.1. NOx Emission

16. NOx emission in the CFG-3 plant will be from reformer stack and HRSG stack. Comparison of NOx emissions from these stacks has been presented in **Table 2.2** for both initial assessment and with revised capacities:

Table 2.2 : NOx Emissions

Stack	Particular	Unit	Initial Assessment	Revised	Percentage Increase
Reformer Stack	Production	MTPD	2000	2200	10%
	Flue Gas	Nm3/hr	330,384	360,000	9%
	NOx Emission	kg/hr	59.1	64.8	10%
		mg/Nm3	179	180	
	kg/MT Ammonia	0.71	0.71 ¹		
GT/HRSG Stack	Flue Gas	Nm3/hr	362,057	362,057	No Change (due to no change in power generation/ GT exhaust gases)
	NOx	kg/hr	74.6	74.6	

¹ No increase in emissions per ton of product