Coromandel
FUTURE POSITIVE

Coromandel International Limited
Post Box No. [illegible], Sriharipuram, Malkapuram Po., Visakhapatnam - 530 011, Andhra Pradesh, India
Tel : [illegible]
[illegible]
Fax : [illegible]
Website : [illegible]
CIN : [illegible]

Date:[illegible].05.2023

[illegible]/APPCB/2023-24

To
The Member Secretary,
A.P. Pollution Control Board,
D.No.33-26-14D/2, Near Sunrise Hospital,
Pushpa Hotel Centre,
Chalamalavari Street, Kasturibaipet,
Vijayawada 520 010

Sub: Submission of Environmental Statement in Form-V for the Financial year 2022-23 as per the Environmental Protection Act -1986 reg.

Ref: 1. Consent Order No: APPCB/VSP/VSP/[illegible] - [illegible]
2. Consent Order No: [illegible] - [illegible]
3. Consent Order No: APPCB/VSP/VSP/[illegible] - [illegible]

Dear Sir,

We are enclosing herewith the Environment Statement for the financial year 2022-23 ending with 31st March 2023 in prescribed Form V with respect to Coromandel International Ltd. along with relevant annexures.

This is submitted as per the guidelines of Environment protection act 1986.

Thanking you.

Yours faithfully
For Coromandel International Limited

M. [illegible]
VP & Head - Manufacturing

Encl: As above

Cc: 1. The Joint Chief Environmental Engineer, Zonal Office, APPCB, Visakhapatnam-18
2. The Environmental Engineer, Regional Office, APPCB, Visakhapatnam-18

EH52-Vizag-Coromandel

From:	Nagarjuna-F-Mgr-EHS-Vizag-Coromandel
Sent:	29 September 2023 11:32
To:	rowsppcb@gmail.com; rowsp-ecf@appcb.gov.in; cowsppcb
Cc:	EH52-Vizag-Coromandel; Subhadip Mandal-Mgr-Environment-Vizag-Coromandel; Nagaraju D-AGM-EHS-Vizag-Coromandel; Vinod Kumar Meher-Sr GM-EHS-Vizag-Coromandel
Subject:	Submission of CL Form-V (Environmental Statement) for the period of 2022-2023
Attachments:	CIL-Vizag-Form -V 2022-2023.pdf

Dear Sir,

Here we are **submitting the Environmental Statement , Form-V** as per Environmental Protection Act, 1986 by **Coromandel International Limited, Visakhapatnam for the period of 2022-2023.**

Same original copy of Form-V along with backup documents we have submitted to head office, APPCB, Vijayawada through postal on **29.09.2023** and same copy submitted to your regional and zonal office today.

Again, we have submitted the same copy through mail as per your instruction.

Regards,
Nagarjuna F
Manager-Environment
9100443439

SAVE ENVIRONMENT SAVE LIFE

Coromandel
FUTURE POSITIVE
Coromandel International Limited
Sriharipuram, Mutyalapuram PO
Visakhapatnam-530 011
Andhrapradesh, India.
P: +91 891-2578400
W: www.coromandel.biz

Coromandel
FUTURE POSITIVE

Coromandel International Limited
[illegible]
Visakhapatnam - 530 ..., Andhra Pradesh, India
Tel : [illegible]
[illegible]
Fax : [illegible]
Website : [illegible]
CIN : [illegible]

Date:28.09.2023

EHS/APPCB/2023-78

To
The Member Secretary,
A.P. Pollution Control Board,
D.No.33-26-14D/2, Near Sunrise Hospital,
Pushpa Hotel Centre,
Chalamalavari Street, Kasturibaipet,
Vijayawada-520 010

Sub: Submission of Environmental Statement in Form-V for the financial year 2022-23 as per the Environmental Protection Act 1986 reg.

Ref: 1. Consent Order No: APPCB/VSP/VSP/CFO/HO/2007 - 10/08/2022
2. Consent Order No: 7055/APPCB/ZO-VSP/CFO/VSP/2021 - 01/11/2021
3. Consent Order No: APPCB/VSP/VSP/05/CFO/HO/2020 - 23/02/2020

Dear Sir,

We are enclosing herewith the Environment Statement for the financial year 2022-23 ending with 31[st] March 2023 in prescribed Form-V with respect to Coromandel International Ltd. along with relevant annexures.

This is submitted as per the guidelines of Environment protection act 1986.

Thanking you

Yours faithfully
For Coromandel International Limited

M. Gnanasundaram
VP & Head - Manufacturing

Encl: As above

Cc: 1. The Joint Chief Environmental Engineer, Zonal Office, APPCB, Visakhapatnam-10

2. The Environmental Engineer, Regional Office, APPCB, Visakhapatnam-18

Form - V
Environment Statement
2022-23

Coromandel
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Coromandel International Limited
Visakhapatnam

Coromandel
FUTURE POSITIVE

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FORM – V
ENVIRONMENT STATEMENT
2022-23

Submitted by
Coromandel International Limited
Visakhapatnam

FORM – V
(See rule 14)

Environmental Statement (Audit Report) for the financial year ending 31st March 2023

PART – A

i)	Name and address of the owner/occupier of the industry, operation or process.	Coromandel International Limited Post Box No. 1116, Sriharipuram, Mallapuram Post Visakhapatnam-530 011 Occupier: Mr. Sankarasubramanian (Executive Director)
ii	Production Capacity	Complex Plant / Customised/ Water Soluble Fertiliser / Micro Nutrients / Chelated Nutrients / Micronised Sulphur / Urea Phosphate : 4210 TPD Sulfuric Acid Plant-I & II : 2100 TPD Phosphoric Acid Plant : 1400 MTPD Bentonite Sulfur : 90 TPD Sulpho Zinc/Boron : 10 TPD Fertiliser Pilot Plant : 24 TPD Phosphoric Acid Pilot Plant : 0.83 TPD By Products: Gypsum : 7000 MTPD Hydrofluorosilicic Acid : 33 MTPD
iii	Year of Establishment	1967
iv	Date of the last Environmental Audit Report submitted.	27/09/2022

PART – B
Water and Raw Material Consumption

i)	Water consumption m^3/d (average break-up) year 2022-23 Process : 5365 DM WATER : 2173 Cooling : FRESH WATER – 1057 SEAWATER : 84600 Domestic : 825			
			Water consumption per unit of products M^3/MT	
	Name of products		During the previous financial year	During the current financial year
			(i) 2021-22	(2) 2022-23
	Complex Fertiliser		5.22	5.17
ii	Raw material consumption			
	Name of raw materials	Name of products	Consumption of raw material per unit of output (MT/MT)	
			During the current financial year 2021-22	During the current financial year 2023-24
	Ref: Annexure – 1			

PART – C

Pollution generated

(Parameters as specified in the consent issued)

S	Pollutants	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants discharges (mass/Volume)	Percentages of variation from prescribed standards with reasons
	(a) Water (b) Air	Ref. Annexure – 2		

PART – D

Hazardous Wastes

(As specified under hazardous wastes Management and Handling Rules, 1989 and amendment 2016)

Stream	Name of the Hazardous waste	Total Quantity	
		During the previous financial year 2021-22	During the current financial year 2022-23
a) From process			
34.2 of Schedule-I	Acid residues (Tank bottom sludge)	18	42.5
34.3 of Schedule-I	ETP Sludge	0.18	12.67
Class II (Sl. No. 37) of Schedule-III	Sulfur muck (sulfur sludge)	650	695
18.1 of Schedule-I	Spent catalyst	24.33	56.088
5.1 of Schedule-I	Used lubricating oil/Drained oil	0.85	12.125
33.1 of Schedule-I	Detoxified containers and container liners	0	0
37.1 of Schedule-I	Scrubbing sludge	695	695
35.3 of Schedule - I	ETP Sludge	0	715
28.4 of Schedule –I	Off specified, expired chemicals & lab chemicals etc.	0	0
–	Glass Wool	0	0
–	Insulation Waste	0	0
b) From pollution control facilities			

PART –E
Solid Wastes

		Total Quantity (MT)	
		During the previous financial year 2021-22	During the current financial year 2022-23
a)	From process	Not Applicable	
b)	Process pollution control facilities		
c)	Quantity recycled or re-utilized i) solid ii) Disposed		

PART – F

Please specify the characteristics (in terms of concentration and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes

a) Maintaining Form-3 and Form-10 (Hazardous Manifest) according to Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.
b) Form-IV Hazardous waste annual returns regularly furnishing to APPCB.

S NO	HAZ Cat. No	Hazardous Waste	Disposal Practice
1	34.2 of Schedule-I	Acid residues (Tank bottom sludge)	Reused in the phosphoric acid plant
2	34.2 of Schedule-I	ETP Sludge	TSDF for incineration or authorized cement manufacturing units for co processing
3	Class B (Sl. No. 37) of Schedule-II	Sulfur muck (sulfur sludge)	Reused into granulation plant after grinding
4	18.1 of Schedule-I	Spent catalyst	Authorized recyclers or TSDF
5	5.1 of Schedule-I	Used lubricating oil/Drained oil	Re-processors or recyclers of waste oil
6	33.1 of Schedule-I	Detoxified containers and container liners	No ext generation
7	37.1 of Schedule-I	Scrubbing sludge	Reused in the granulation plant
8	35.3 of Schedule - I	ETP Sludge	Reused in Phosphoric acid plant
9	28.4 of Schedule – I	Off specified, expired chemicals & lab chemicals etc.	

Ref: Annexure – II

PART – G

Impact of the pollution control measures on conservation of natural resources and consequently on the cost of production.

On account of pollution control measures implemented in last two years following savings could be realized.

Material saved	Saving(Rs. Lakhs/annum)	Quantity(per annum)
Water recycled by rain water harvesting	10.22	29622 m3

PART – H

Additional investment proposal for environmental protection including abatement of pollution:

Sl No	Title of Project	Year	Annual Electrical Saving (kWh)	Electrical Saving (W	Electrical Energy Savings Rs.Million	Thermal savings Quantity in Annual Thermal Saving (mkcal / Year)	Thermal Energy Savings Rs.Million	Total Energy Savings Rs. Million	Investment in Million	Payback months	Comments
1	Green Building	2012-13	45824	17	0.28			0.28	3.0	86	Green building with Solar natural lighting in periphery, Variable Refrigerant Flow Air Conditioning system and heat reflective painting installed for Centre of Excellence Green building
2	Solar Street Lighting	2012-13	3436	0.4	0.022			0.02	0.7	389	Deployed 11 nos 90W & 5 nos 40 W solar lamps with traffic sensors
3	LED Lighting	2012-13	101880	23.2	0.65			0.65	0.5	9	Deployed 477 nos 45W LED lamps, 290 nos 28W lamps at Plant and Administrative Building replacing MH & CFL lamps
4	Replacement of 53 nos age old wind ow AC units with 5 star rating units	2012-13	71708	18.9	0.40			0.4	1.5	45	Deployed 3 star rating Units replacing 42 nos 1.5 TE and 10 nos 2 TE age old window AC units
5	Battery Operated Transport Vehicles	2012-13				4.23	0.00	0.03	0.9	240	Deployed Electric Auto rickshaw and Electric Car
6	Bicycles for all employees for Commuting To & from workplace	2012-13				316.18	3	3.0	6.0	24	660 nos bicycles were distributed to all employees for commuting To & Fro workplace

Sl No	Title of Project	Year	Annual Electrical Saving (kWh)	Electrical Saving kW	Electrical Energy Saving Rs Million	Thermal savings Quantity (t)	Annual Thermal Saving (mkcal / Year)	Thermal Energy Saving Rs Million	Total Energy Savings Rs Million	Investment Rs Million	Payback months	Comments
7	Higher Pipe Size Instrument Air Piping	2022-23	225171	15.8	0.89				0.9	4.1	123	Instrument Air pipesize enhanced to 4" and 3 nos 25 M3 each air receivers installed at process plants for increasing air cushion
8	Evaporator – II Steam Condensate recovery at Utilities Plant	2022-23	228288	15.8	0.8				0.8	3.3	52	Laid Piping for recovery of Evap II Condensate at Utilities Plant
9	Laid Port & Market Connectivity Internal Roads through shortest Route	2022-23					796.31	8	8.1	137	202	Laid Port & Market Connectivity road through shortest distance
10	HP Steam Line interconnecting AFBC Boiler and Sulfuric acid plant steam systems	2022-23	322700	40.9	2.22				2.2	22	122	Laid HP Steam line interconnecting AFBC Boiler and Sulfuric acid plant steam systems
11	5 Star Packaged Air Handling Units replacing split air conditioners	2022-23	59420	4.5	0.25				0.25	1.20	57	5 Star Packaged Air Handling Units replaced multiple split air conditioners
12	Turbo Generator – Island mode operation	2022-23	119482	13.6	2.32				2.32	9.20	48	Island mode Operation of Sulphuric Acid – I & II & Turbo Generator, preventing trip of energy generation system during Grid Power failure
	TOTAL		940759	124	8	0	1117 8.6	11	19	393	124	
	Power cost Rs/kWh											

Environment Improvement Measures

[illegible]

[illegible]

[illegible]

Ref: Annexure- 4

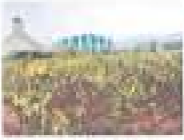
PART – I

Any other particulars in respect of environment protection and abatement of pollution:

A report covering various efforts made by Coromandel International Limited for control of environmental pollution along with details of processes adopted in various units is given in savings made by some other activities and savings through Energy Conservation.

Greening within the Fence

Herbal Garden



[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Accolades

CII Energy Efficient Unit Award 2022 for the 18th time in the past 21 years

Institute of Quality & Environment, Odisha Kalinga Environment Protection Award 2022

FRSI 2nd Prize for Green Thinker under Sustainability Report

Your faithfully,
For Coromandel International Limited,

M. Gnanasundaram
VP & Head – Manufacturing

M. GNANASUNDARAM
Vice President & Head Mfg.
Coromandel International Limited
Andhra Pradesh, India

Annexure-I

Raw Material	Product Name/ Complex Grade	Financial Year 2020-21 MT/MT	Financial Year 2021-22 MT/MT	Financial Year 2022-23 MT/MT
Sulfuric acid	28:28:00	0.0424	0.0378	0.0230
Phosphoric acid	28:28:00	0.2843	0.2849	0.2842
Ammonia	28:28:00	0.1418	0.1320	0.1771
Urea	28:28:00	0.3800	0.4012	0.4134
MAP	28:28:00	0	0	0
Ammonia	14:35:14	0.1750	0.1780	0.1780
Potash	14:35:14	0.2402	0.2410	0.2410
Phosphoric acid	14:35:14	0.3553	0.3607	0.3612
Ammonia	20:20:00	0.2299	0.2290	0.2254
Phosphoric acid	20:20:00	0.2950	0.2951	0.2950
Sulfuric acid	20:20:00	0.3690	0.3696	0.3488
Ammonium Sulphate	20:20:0	0	0	0.084
Urea	20:20:00	0.0522	0.0337	0.0438
Sulfur	Sulfuric acid	0.3300	0.3281	0.3286
sulfuric acid	Phosphoric acid	2.7168	2.7884	2.8137
Rock phosphate	Phosphoric acid	3.1916	3.2597	3.402
Ammonia	10:26:26	0.1236	0.1236	0.1183
Potash	10:26:26	0.4601	0.4472	0.4581
Phosphoric acid	10:26:26	0.2639	0.2630	0.2636
Ammonia	15:15:15:9	No Production	No Production	0.1621
Phosphoric acid	15:15:15:9			0.1529
Potash	15:15:15:9			0.2651
Sulfuric acid	15:15:15:9			0.2636
Phosphoric acid	24:24:08:65	0.2454	0.2488	0.2479
Sulfuric acid	24:24:08:65	0.1689	0.1763	0.1140
Ammonia	24:24:08:65	0.1554	0.1515	0.1482
Urea	24:24:08:65	0.2689	0.2812	0.2816
Sulfur	24:24:0:65	0.0584	0.0792	0.0542
Phosphoric acid	UAP 20-20-0	No Production	0.2877	No Production
Sulfuric acid	UAP 20-20-0		0.3557	
Ammonia	UAP 20-20-0		0.1930	
Urea	UAP 20-20-0		0.1039	

Annexure - 2

	Environment Quality Report- Effluent: 2022-23				
0	Pollutants	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants discharges (mass/Volume)	APPCB limit mg / lt.	Percentages of variation from prescribed standards with reasons
	Water				
1	pH	–	7.58	6.5 – 8.5	No Variation from Standards
2	Ammonical Nitrogen	–	11.92	50 mg/l	
3	Free Ammonical Nitrogen	–	0.17	4 mg/l	
4	Total Ejeldahl Nitrogen	–	23.08	75 mg/l	
5	Nitrate Nitrogen	–	0.1	20 mg/l	
6	Cyanide as CN	–	BDL	0.1 mg/l	
7	Vanadium as V	–	BDL	0.2 mg/l	
8	Arsenic as As	–	BDL	0.2 mg/l	
9	Phosphate as P	–	0.68	5 mg/l	
10	Suspended solids	–	24.67	100 mg/l	
11	Oil and Grease	–	BDL	10 mg/l	
12	Fluoride as F	–	0.92	10 mg/l	
13	Hexavalent Chromium as Cr	–	BDL	0.1 mg/l	
14	Total Chromium as Cr	–	BDL	2.0 mg/l	
15	BOD	–	14.42	30 mg/l	
16	COD	–	77.33	250 mg/l	
	Air				
		Emissions, TPA	Emissions, mg/Nm³	APPCB limit mg/Nm³	No Variation from Standards
1	Complex plant A				
	Ammonia	42.73	61.21	105	
	Fluoride	2.19	1.21	4	
	SPM	30.51	16.81	45	
2	Complex plant B				
	Ammonia	53.03	73.61	105	
	Fluoride	1.5	0.82	4	
	SPM	22.06	12.03	45	

3	Complex plant C				
	Ammonia	38.47	36.34	185	
	Fluoride	2.23	1.25	4	
	SPM	4.22	2.37	45	
4	Phosphoric acid plant-I				
	Total Fluoride	1.35	0.98	20	
	SPM	5.75	4.48	50	
5	Phosphoric acid plant -II				
	Total Fluoride	0.4	1.6	20	
	SPM	1.04	7.01	50	
6	Sulfuric acid plant-I				
	Sulfur di oxide	-	0.024	1 kg/ MT of product	
	Sulfur trioxide	-	0.04	0.35 kg/ MT of product	
	Acid mist	-	10.98	20	
7	Sulfuric acid plant- II				
	Sulfur di oxide	-	0.031	0.35 kg/ MT of product	
	Sulfur trioxide	-	0.04	0.35 kg/ MT of product	
	Acid mist	-	9	20	
8	Boiler-PM	9.75	19.38	115	

EFFLUENT DISCHARGE STANDARDS	
Parameter	PCB Standards
pH	6.5 – 8.5
Ammonical Nitrogen	50 mg/l
Free Ammonical Nitrogen	4 mg/l
Total Kjeldahl Nitrogen	75 mg/l
Nitrate Nitrogen	20 mg/l
Cyanide as CN	0.1 mg/l
Vanadium as V	0.2 mg/l
Arsenic as As	0.2 mg/l
Phosphate as P	5 mg/l
Suspended solids	100 mg/l
Oil and Grease	10 mg/l
Fluoride as F	30 mg/l
Hexavalent Chromium as Cr	0.1 mg/l
Total Chromium as Cr	2.0 mg/l
BOD	30 mg/l
COD	250 mg/l
Temp. - Not more than 5 °C higher than intake water.	

AIR EMISSION STANDARDS		
S.No	Parameter	APPCB limit mg/Nm3
1	Complex plants	
	Ammonia	165
	Fluoride	4
	SPM	45
2	Phosphoric acid plants	
	Total Fluoride	20
	Particulate matter	50
3	Sulfuric acid plant-I	
	Sulfur di oxide	1 kg/MT of prod
	SO3	0.35 kg/MT of prod
	Acid mist	70
4	Sulfuric acid plant- II	
	Sulfur di oxide	0.65 kg/MT of prod
	SO3	0.35 kg/MT of prod
	Acid mist	70
5	Rock Grinding	50
6	Boiler Stack	115

Coromandel

FUTURE POSITIVE

Coromandel International Limited

[illegible]

[illegible]

Date: [illegible]

To,

The Environmental Engineer,
A.P. Pollution Control Board,
D.No. 33-26-14 D/2,
Near Sunrise Hospital,
Pushpa Hotel Centre,
Chalamalavari Street,
Kasturibaipet, Vijayawada – 520010

[illegible]

Dear Sir,

Sub: Coromandel International Limited - Visakhapatnam - Submission of Hazardous Waste Annual Returns in Form-4 - FY2022-2023 - Regarding

Ref: Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

We are herewith furnishing annual returns (for the period April'22 to March'23) in Form-4 as per "Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016" and amendment thereof under E(P) Act, 1986.

Kindly acknowledge the receipt of same.

Thanking you,

Yours Truly,

For COROMANDEL INTERNATIONAL LIMITED

Gnanasundaram M
Vice President & Head Manufacturing

Encl: As above

CC to: 1) The Environmental Engineer, Regional Office, APPCB, Visakhapatnam.

Coromandel
FUTURE POSITIVE

Coromandel International Limited
[illegible]

[illegible]

Date: 15.05.2023

To
The Environmental Engineer,
A.P. Pollution Control Board,
D.No. 33-26-14 D/2,
Near Sunrise Hospital,
Pushpa Hotel Centre,
Chalamalavari Street,
Kasturibaipet, Vijayawada – 520010

Dear Sir,

Sub: Coromandel International Limited- Visakhapatnam- Submission of Hazardous Waste Annual Returns in Form-4 – FY2022-2023 - Regarding.

Ref: Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

We are herewith furnishing annual returns (for the period April'22 to March'23) in Form-4 as per "Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016" and amendment thereof under E (P) Act, 1986.

Kindly acknowledge the receipt of same.

Thanking you,

Yours Truly,

For COROMANDEL INTERNATIONAL LIMITED

Gnanasundaram M
Vice President & Head Manufacturing.

[illegible]

CC to: 1) The Environmental Engineer, Regional Office, APPCB, Visakhapatnam.

FORM 4				
[illegible]				
[illegible]				
1	[illegible]	[illegible]		
		[illegible]		
		[illegible]		
2	[illegible]	[illegible]		
		[illegible]		
3	[illegible]	[illegible]		
		[illegible]		
		[illegible]		
		[illegible]		
4	[illegible]	[illegible]	[illegible]	MT/Annum
		[illegible]	[illegible]	
		[illegible]	[illegible]	
Part A. To be filled by hazardous waste generator				
1	Total quantity of waste generated category wise	Name of the hazardous waste	Quantity generated	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
		[illegible]	[illegible]	
2	Quantity dispatched	[illegible]	Name of the hazardous waste	Quantity dispatched
			[illegible]	[illegible]
			[illegible]	[illegible]
			[illegible]	[illegible]
			[illegible]	[illegible]
			[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]
		[illegible]	--	--

FORM 4

[illegible]

FORM FOR FILING ANNUAL RETURNS

[To be submitted to State Pollution Control Board by 30th day of June of every year for the preceding period April to March]

3	Quantity sold [illegible], if any	Name of the Hazardous waste	Quantity [illegible]
		1) [illegible]	[illegible]
		2) [illegible]	[illegible]
		3) [illegible]	[illegible]
		4) ETP sludge	[illegible]
4	Quantity in storage at the end of the year	Name of the Hazardous waste	Quantity Storage
		1) [illegible]	[illegible]
		2) [illegible]	[illegible]
		3) Spent Catalyst	[illegible]
		4) [illegible]	[illegible]
		5) [illegible]	[illegible]
		6) [illegible]	[illegible]
		7) [illegible]	[illegible]
		8) ETP sludge	[illegible]
		9) [illegible]	[illegible]
		10) [illegible]	[illegible]
		11) [illegible]	[illegible]

Part B. To be filled by Treatment, storage and disposal facility operators

1	Total quantity received -	Not applicable
2	Quantity in stock at the beginning of the year -	
3	Quantity treated -	
4	Quantity disposed in landfills as such and after treatment -	
5	Quantity incinerated (if applicable) -	
6	Quantity processed other than specified above -	
7	Quantity in storage at the end of the year -	

Part C. To be filled by recyclers or coprocessors or other users

1	Quantity of waste received during the year - 1) domestic sources	Not applicable
2	Quantity in stock at the beginning of the year -	
3	Quantity recycled or co-processed or used	
4	Quantity of products dispatched (wherever applicable) -	
5	Quantity of waste generated	
6	Quantity of waste disposed	
7	Quantity re-exported (wherever applicable)	
8	Quantity in storage at the end of the year	

[signature]

Date: [illegible]

Place: Visakhapatnam

Signature of the Occupier or Operator of the disposal facility

COROMANDEL VIZAG

Sustainability Measures

SUB: Environmental – Energy Conservation

Name of the Project: Green Building adoption for Centre of Excellence & Knowledge Centre

Problems faced before implementation of initiative:

- Higher energy consumption for Power, HVAC & Lighting

Brief Description: Green Building with Solar natural lighting in periphery, Variable Refrigerant Flow Air Conditioning system and heat reflective painting installed for Centre of Excellence Green building.

New Technologies adopted: 1) Modern Green Building adoption 2) Energy efficient, 3) Solar natural lighting in periphery 4) Variable Refrigerant flow HVAC System 5) Heat reflective painting and sprouting green campus.

Cost – Rs 3 million Annual Savings 43680 kWh Annual Savings Rs 0.3 million
Payback 86 month Completed Date Feb 2023

Challenges faced during the project:
1) Availability of expertise for taking up modern technologies

Prevailing practice in the industry: Maximise deployment of Green Building Concept

COROMANDEL VIZAG

Sustainability Measures

SUB: Environmental – Energy Conservation

Name of the Project: Solar Street lighting

Problems faced before implementation of initiative:

- Lower life cycle of Solar lamps
- Charging based on Sunlight during the day.

Brief Description: Installation of Solar Street lighting

Cost – Rs 0.71 million Annual Savings 2416 kWh Annual Savings Rs 0.02 million
Payback 359 month Completed Date Mar 2023

Benefits: 1) Green Energy

Challenges faced during the project:
1) Availability of expertise and
2) Incidence of higher failure rate

Prevailing practice in the industry: Maximise deployment based on reliability and improved longer life cycle

COROMANDEL VIZAG

Sustainability Measures

SUBI- Environmental – Energy Conservation

Name of the Project: LED lights replacing Metal halides & Compact Fluorescent lamps

Problems faced before implementation of initiative:

- Lower life cycle of Compact Fluorescent Lamps
- Lower Luminosity.

Brief Description: LED lights replacing Compact Fluorescent lamps.

Conversion	From	Watts / Lamp	To	Watts / Lamp	No. of lamps
Administration Building	Compact Fluorescent Lamps	18	LED Lighting	18	150
Plant	Metal halide lamps	80	LED Lighting	45	477

Cost – Rs 0.5 million Annual Savings 10,500 kWh Annual Savings Rs 0.85 million
Payback 8 month Completed Date Mar 2013

Benefits: 1) Improved Luminosity

Challenges faced during the project:
1) Availability of expertise and
2) Availability of infrastructure at affordable cost

Prevailing practice in the industry: Maximize deployment of LED lighting.

COROMANDEL VIZAG

Sustainability Measures

SUM : Environmental – Energy Conservation

Name of the Project: Replacement of age-old Air conditioner units with modern 3 Star Units

Problems faced before implementation of initiative:

- Higher Energy Consumption

Brief Description: 52 nos Age old Air conditioner units replaced by modern 3 Star Units.

Cost – Rs 1.5 million Annual Savings 72708 kWh Annual Savings Rs 0.4 million
Payback 46 month Completed Date Mar 2013

Benefits:
1) Improved Air Conditioning
2) Lower Energy Consumption

Challenges faced during the project: None.

Prevailing practice in the industry: Maximise deployment of modern 3 Star AC Units.

COROMANDEL VIZAG

Sustainability Measures

SUB: Environmental – Green Internal Transport

Name of the Project: Battery Operated Electric Automotive for internal transport.

Problems faced before implementation of initiative:

- Higher running cost of Diesel automotive

Brief Description: Battery Operated Electric Automotive for internal transport.

Cost: – Rs 0.935 million Annual Savings 5 nos/ Annual Savings Rs 0.05 million
Payback 249 month Completed Date Mar 2023

Benefits:

1. Zero emissions
2. Lower maintenance cost

Challenges faced during the project:
1) Battery Life & capacity degradation over the years

Prevailing practice in the industry: Maximise deployment of Electric/ Automotives.

COROMANDEL VIZAG

Sustainability Measures

SUBI: Environmental – Green Internal Transport

Name of the Project: Bicycle for all employees for commuting to & from day workplace.

Problems faced before implementation of initiative:

- Higher running cost of transport

Brief Description: 600 nos Bicycles distributed for all employees for commuting to & from the workplace.

Cost – Rs 6 million Annual Savings 316 mkcal Annual Savings Rs 3 million
Payback 24 months Completed Date Feb 2023

Benefits:

1. Zero emissions
2. Lower maintenance cost
3. Healthier workforce

Challenges faced during the project:
1) Acceptability of Bicycles of medium and high end

Prevailing practice in the industry: Maximize deployment of Bicycles as a means of transport.

COROMANDEL VIZAG

Sustainability Measures

3.(B) Environmental – Green Internal Transport

Name of the Project: Higher Pipe size Instrument Air Piping.

Problems faced before implementation of initiative:

- Higher pressure drop, in piping.
- Frequent Cut-in / Cut-off of compressors.

Brief Description: Instrument skilline size increased to 4" size from Utilities to Complex, Utilities to Sulphuric Acid, Phosphoric acid & ETP plants.

2 no's 25 M^3 each Instrument Air Receivers installed to increase Air hold up capacity and reduce Instrument Air pressure drop in the system.

Cost – Rs 8 million Annual Savings 135373 kWh
Annual Savings Rs 0.8 million
Payback 121 months Completed Date Dec 2022

Benefits:

1. Smooth operation of Instrument Air compressors
2. Lower pressure drop and operating cost of Instrument air system

Challenges faced during the project:
1) Quantification of Instrument Air required by each process plant

Prevailing practice in the industry: Maximise deployment of low pressure drop Instrument air system.

COROMANDEL VIZAG

Sustainability Measures

SUBI : Environmental – Energy Conservation

Name of the Project: Evaporator - II Steam Condensate recovery at Utilities Plant.

Problems faced before implementation of initiative:

- Contamination of Condensate.
- Lower recovery by AFBC Boiler due to Stringent Quality Control for high Pressure Boiler

Brief Description: Evaporator II Steam Condensate recovery at Utilities Plant for make up medium pressure boiler.

Laid 500-meter-long steam condensate piping for recovery at Utilities Plant along with Instrument controls

Cost – Rs 5.3 million Annual Savings 139186 kWh Annual Savings Rs 0.8 million
Payback 51 months Completed Date Sep 2022

Benefits:

1. Improved recovery of Steam Condensate
2. Control on effluent generation

Challenges faced during the project:
1) Contamination of condensate, lower recovery potential

Prevailing practice in the industry: Maximise recovery of uncontaminated steam condensate

COROMANDEL VIZAG

Sustainability Measures

SUB: Environmental – Energy Conservation

Name of the Project: Laid Port and Market Connectivity Roads through shortest route.

Problems faced before implementation of Initiative:

- Long Circuitous Public Road
- Road Transport Safety - Existing road closed due to proximity to Ammonia storage.

Brief Description: Laid Port and Market Connectivity roads through shortest route

Laid 2-Kilometer-long Road with green plantation as barrier on the road periphery for dust control during transportation.

Cost – Rs 137 million Annual Savings 798 mkcal Annual Savings Rs 6 million
Payback 292 months Completed Date Feb 2023

Benefits:

1. Distance saving by two kilometers to and from and consequent fuel oil savings.
2. Own Private road, improved logistical speeds of delivery

Challenges faced during the project:
1) Road laid on old Gypsum Pond, Strengthening of soil for heavy truck traffic road formation

Prevailing practice in the industry: Lay roads through shortest routes for transport speed and cost savings

COROMANDEL VIZAG

Sustainability Measures

Skill: Environmental – Energy Conservation

Name of the Project: HP Steam Line interconnecting AFBC Boiler and Sulfuric acid plant steam systems.

Problems faced before implementation of initiative:

- High pressure steam, requiring Pressure reduction and de-superheating station along with Pressure controls.
- IBR piping and elaborate regulatory compliance

Brief Description: HP Steam Line interconnecting AFBC Boiler and Sulfuric acid plant steam systems.

Laid IBR piping with Pressure reducing and de-superheating station and other controls for connecting steam from high pressure boiler to medium pressure steam network.

Cost – Rs 22 million Annual Savings 31576 kWh Annual Savings Rs 2 million Payback 133 months Completed Date Feb 2013

Benefits:

1. Avoid Process Plant shutdown and consequent Steam venting of steam for other boilers during tripping of one of the boilers.

Challenges faced during the project:
1) Installation of IBR piping and want of pressure controls for interconnecting high pressure steam to medium pressure Steam system.

Prevailing practice in the industry: Inter connect boilers, so as to act as standby in case of tripping of operating boiler and avoid consequent energy losses.

COROMANDEL VIZAG

Sustainability Measures

Multi - Environmental – Energy Conservation

Name of the Project: Installation of modern 3 Star Packaged Air Handling Units by replacing multiple Window / Split Air conditioner units

Problems faced before implementation of initiative:

- Higher Energy Consumption

Brief Description: Installation of modern 3 Star Packaged Air Handling Units by replacing multiple Window / Split Air conditioner units

Plant	Tonne Reasure
Phosphoric Acid Plant - I	5.5 TR Air Handling Unit
Phosphoric Acid Plant - II	2 x 11 TR Air Handling Unit Installed
ARST	3 x 5.5 TR Air Handling Unit Installed

Cost – Rs 1.2 million Annual Savings 39420 KWh Annual Savings Rs 0.25 million
Payback 57 month Completed Date: Mar 2023

Benefits:
1) Improved Air Conditioning
2) Lower Energy Consumption

Challenges faced during the project: None.

Prevailing practice in the industry: Maximize deployment of modern 3 Star Packaged AC Units and replace old multiple Window and Split air conditioners.

Then

Now

COROMANDEL VIZAG

Sustainability Measures

Skill: Environmental – Energy Conservation

Name of the Project: Island mode operation of Sulphuric Acid Plant I & II & Turbo Generator - I

Problems faced before implementation of initiative:

- Tripping of Captive Power Generation during Grid power failure
- Standby High cost Diesel Generator Power during Grid Power failure to meet energy needs and to limit Maximum Demand on Grid Power.
- Loss of Productivity & efficiency of Sulphuric acid Plant and Turbo Generator

Brief Description: Operationalised Island mode operation of Sulphuric Acid Plant I & II & Turbo Generator – I

Island mode operation stabilized & no more shutdowns due to Grid Power failure since then

Cost – Rs 9.2 million Annual Savings 12MMI kWh Annual Savings Rs 2.32 million
Payback 48 month Completed Date May 2022

Benefits:
1) Captive Power system free of Grid Power disturbance
2) Steady Process and Power Plant operation

Challenges faced during the project: Power circuit modernisation & interconnection.

Prevailing practice in the industry: Island mode operation is a best practice.

SUB : Environmental – Nature Conservation - Greening within Fence

Name of the Project: **Greening within Fence - Miyawaki Plantation**

Problems faced before implementation of initiative:

1. Degraded land that has been used for construction and nonagricultural purposes.

Brief Description: Miyawaki Plantation involves plantation of trees, native to the area, with species that complement each other. As saplings receive sunlight from the top and grow upward, rather than sideways. It helps prevent growth of weeds, by avoiding sunlight reaching the soil.

S.no.	Area Of plantation	No. of plants	Year	Cost
1	Phase - I	3000	2021-22	
2	Phase - II	10000	2021-22	
3	Phase - III	10000	2022-23	Rs 50 Lakh

Greenery in more than 120 acres out of 320 acres industrial site (37.5%), adherence to better than regulatory norm.

Cost of the project: Rs. 50 Lakh

Benefits:

1. Creating Carbon sink in the area.
2. Control of fugitive emissions due to road traffic

Challenges faced during the project:

- Challenging sediment conditions, acidic soils necessitating laying of proper soil

Prevailing practice in the industry:
Driving Compliance to APPCB order that 33% of industrial site around a factory is to be green.

Plantation at 30th Gate

Miyawaki Plantation

SUB : Environmental – Green Internal Transport

Name of the Project: **Greening Transport** – Roll out of BS VI compliant commercial vehicles.

Problems faced before implementation of initiative:

1. Higher fugitive particulate, NOx, emissions from transport vehicles.

Brief Description: Roll out of BS VI compliant Raw Material Commercial Vehicles, equipped with Diesel Particulate Filter, Selective Catalytic reduction system Lean NOx trap, Real driving emission monitoring and Onboard diagnostics and most importantly BS6 compliant fuel to meet emission norms.

Benefits:

1. Lower emissions by adoption of cleaner fuels.
2. Improved fuel efficiency

Challenges faced during the project:

- Availability of BS6 compliant vehicles

Prevailing practice in the industry:
Driving Compliance to APPCB order that 33% of industrial site around a factory is to be green.

Then BS IV Tankers

Now BS VI Tankers

Then BS IV Dumpers

Now BS VI Dumpers

SUB: Environmental – Nature Conservation – Greening within Fence

Name of the Project: **Green Tractor for Maintaining Green Estate**

Problems faced before implementation of initiative:

1. Greenery Maintenance in Estate. Water supply for plantation & clearing of dry vegetation.

Brief Description: Green Tractor for Maintaining Green Estate

Cost of the project: Rs. 9.41 Lakh

Benefits:

1. Ensure Water supply for plantation.
2. Clearing of dry vegetation

Challenges faced during the project:

- Funds allocation for purchase of company owned tractor.

Prevailing practice in the industry:

Driving Compliance to APPCB order that 33% of Industrial site around a factory is to be green.

Name of the Project: **Anion Rinse Water Recovery**

Problems faced before implementation of initiative:

1. Segregation of Anionic & Cationic Rinse Water

Brief Description: Anion Rinse Water Recovery

Cost of the project: Rs. 61 Lakh

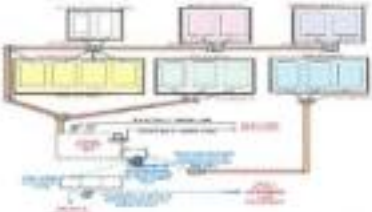
Benefits:

1. Environment Compliance – Control of pH exceedance of effluents.
2. Control of caustic soda consumption

Challenges faced during the project:

- Construction of drains for segregation of Anionic & Cationic Rinse Water and provision of storage of Anionic Rinse Water in Plastic lined Tube settler tank.

Prevailing practice in the industry:
Ensuring Compliance to APPCB order on Effluent pH



Anion Rinse Water Collection Pit

Anion Rinse Water Pumping Pit

Skill: Environmental – Effluent Control Better than regulatory norms

Name of the Project: **Tarpaulin Covered Gypsum Wagons**

Problems faced before implementation of initiative:

1. Dust spillage during Wagon Movement
2. Loss of Containment in Wagons during rain while transporting

Brief Description: Tarpaulin covered Gypsum Wagons

Benefits:

1. Environment Compliance – Control of Air & Land Pollution.
2. Control of Gypsum Quality

Challenges faced during the project:

- Time Management for covering wagons without incurring rail demurrage.

Prevailing practice in the industry:
Ensuring Compliance to APPCB order on Environment & Control of Gypsum Quality

Tarpaulin Covered Gypsum Rail Wagons Leaving Plant Gypsum Siding

Skill: Environmental – Effluent Control Better than regulatory norms

Name of the Project: **Dust Monitoring**

Problems faced before implementation of initiative:

1. Periodic Monitoring of SPM in exhaust air

Brief Description: Installation of Dust Monitoring devices on exhaust stacks of 1) Old Ball Mill, New Ball Mill and PAP stacks

Cost: Rs 11.4 Lakhs

Benefits:

1. Compliance to APPCB order.
2. Control on SPM emissions

Challenges faced during the project:

- Technological difficulties for SPM measurement under moist conditions in stack.

Prevailing practice in the industry:
Ensuring Compliance to APPCB order on Environment

New Mill Stack SPM online monitoring

Sub: Environmental – Effluent Control better than regulatory norms

Name of the Project: **Waste as a Resource**

Problems faces before implementation of initiative:

1. Accumulation of Paper Waste
2. Paper Waste Disposal by combustion, municipal waste leading to Air and Land fill Pollution.

Brief Description: 42 MT of paper waste recycled as a resource to Paper Industry

Earnings: Rs 4.2 Lakhs

Benefits:

1. Environmental Savings 714 trees, 126 M^3 land fill space, 294 KL of Water, 15839 kWh energy, 3.25 MT $CO2$
2. 588 ft^2 of valuable office space saved, utilised for other productive purposes.

Challenges faced during the project:

- Implementation of Retention Policy of Documents.
- Identification, segregation, and disposal of document Records
- Gemba Walks by Plant Senior Management driving determined 5S culture at workplace.

Prevailing practice in the industry:
Waste as a resource is a valuable environmental improvement initiative.

Appreciation from User of Waste as Resource

Larger capacity Paper Shredder

Utilization of space for other Productive Purposes

Skill: Environmental – Effluent Control Better than regulatory norms

Name of the Project: **Automatic Caustic Solution dosage in SAP-I & II Alkali Scrubbers**

Completed 13th Jan-2023

Annexure-5

Environmental Control Measures
Coromandel International Limited
Visakhapatnam

s.no	EHS (2022-23)	Rs. Lakhs
1	Green Bulding	20
2	Solar Street lighting	7.1
3	LED lighting	5
4	Replacement of age-old Air conditioner	15
5	Battery Operated Electric Automotive	10
6	Haritha vanam Red soil	16
7	Miyawaki Phase-III & IV	174
8	Evaporator - II Steam Condensate recovery	33
9	2 km plant bypass road	1370
10	Anion Rinse Water Recovery system	51
11	CAAQMS & OCEMS (New & O&M)	100
12	STP Capacity Enhancement	50
13	ETP sludge storage shed	150
14	Digital Display Board	3.0
15	NOx Analyzer	14
	Total	**2028.1**

s.no	EHS (2021-22)	Rs. Lakhs
1	Water recovery by rainwater harvesting	100
2	Gypsum Pond Leachate Recovery System	670
3	Installation of impervious HDPE Geo permeable membrane liner	650
4	Renovation of Online Continuous Emission Monitoring system	180
5	Renovation of Continuous Ambient Air Quality Monitoring system	70
6	Haritha vanam Grass Cover	24
7	Miyawaki PH-II	45.6
8	Prill Tower area Grass	12
9	Colony Plantation	2
10	Green Visakha	271
11	Wharf plantation	2
	Total	**2026.6**

s.no	EHS (2020-21)	Rs. Lakhs

1	Green Visakha Plantation	266
2	CAAQMS at Garage location	49
3	EPR Charges for Plastic Waste Management	80
	Total	**395**

s.no	EHS (2019-20)	Rs. Lakhs
1	Green Visakha Plantation	140
2	HDPE liner for Gypsum Pond	1300
	Total	**1440**

s.no	EHS (2018-19)	Rs. Lakhs
1	Green Visakha Plantation	100.0
2	Gypsum Neutralization Unit	70.0
3	Drains Improvement (PA Plant)	25.0
4	Energy Efficient lighting at plants	20.0
5	Grass plantation at gypsum Pond on trials	5.0
	Total	**220.0**

s.no	EHS (2017-18)	Rs. Lakhs
1	Oil Skimmer	25.0
2	Green Visakha Plantation	50.0
3	PAP & remining stacks analysers	43.0
4	Gypsum Neutralization Unit	1000.0
	Process Drains Improvement (PA Plant)	130.0
	Total	1248.0

s.no	EHS (2016-17)	Rs. Lakhs
1	Oil spill recovery equipment	46.0
2	Sewage Treatment Plant	51.0
3	A , B Train – Online monitoring & Closed Circuit Camera	63 .0
	Total	160.0

s.no	EHS (2015-16)	Rs.Lakhs
1	Ambient Air Quality – 3rd stations (replacement to Cyclone damaged)	50.0
2	Online Monitoring equipment (Complex plant C train)	18.0

3	Plantation (Inside + outside)	54.0
4	Improvements in Effluent Handling	55.0
	Total	177.0

s.no	EHS (2014-15)	Status	Rs.Lakhs
1	Replacement of damaged insulation due to HUD-Hud Cyclone	2014-15	230
2	Mechanical Plate exchanger replacement at SAP-1	2014-15	80
3	Pre-scrubber tank replacement	2014-15	18
4	REPL. OF BME CANDLES FOR SAP-1 AND SAP-2	2014-15	40
5	Replacement of Dedusting system ay Chain Cyclone ducts	2014-15	32
	Total,Rs/-		**400**

s.no	EHS (2013-14)	Status	Rs.Lakhs
1	Green Belt Development by TERI on Gypsum pond	2013-14	250
2	REPL. OF BME CANDLES FOR SAP-1 AND SAP-2	April'13	62
	Total,Rs/-		**312**

s.no	EHS (2012-13)	Status	Rs.Lakhs
1	3rd online AAQM station	March'13	60
2	Green Visakha -15000 saplings	March'13	58
3	A,B TRAIN COOLER CYCLONE DUCTING,RENEWAL	Nov'12	22
	Total,Rs/-		**140**

s.no	EHS (2011-12)	Status	Rs.Lakhs
1	Portable workplace monitoring system	May'12	10
2	Green Visakha at Air port	March'13	50
	Total,Rs/-		**60**

	Capex -EMS(2010-11)	Status	Rs. Lacs
1	Effluent / Storm Water drains management	Feb'2011	30.00
2	Ambient Air Quality monitoring Station	March'2011	60.00
3	Effluent Treatment Plant(ETP)	August'2011	1600.00
4	HDPE lining -Gypsum siding area (About 5 acres)	July'2010	150.00
5	Telescopic chutes for Rock Go down	Feb'2011	45.00
6	Structural Stability	2010-11	120.00
7	Replacement of BME candles for FAT & DT	March'2011	40.00
8	AAQM Station at Mulagada village	Nov'2010	22.00
	Total(Lacs)		**2067.00**

2009-10			**(Rupees lakhs)**
Sl. no.	**Measure**	**Year installed**	**Cost Rs. Lakhs**
1.	HDPE lining Gypsum area – 5 acres	2009	100.00
2.	Water Conservation	2009	50.00
3.	Improvement to storm water drain system	2009	30.00
4.	Greenbelt Development	2009	17.00
5.	Start up Alkali Scrubber at 1400 MTPD sulfuric acid plant to reduce SO2 emissions	2009	135.00
6.	Fire water system for AAST	2009	30.00
7.	Ambient air monitoring station(AAQM)	2010	75.0
8.	Study of scrubbing system at complex plant	2009	10.00
9.	Filling of Black cotton soil at 7th gate	2010	15.00
		TOTAL(Lacs)	**462.00**

Sl. no.	Measure	Year installed	Cost Rs. Lakhs
10.	Installed Dry gypsum Disposal system at Phosphoric acid plant	April'2009	2900
11.	BME candles for Final absorption tower of SAP-II	2008	10
12.	Procured road sweeping machine to reduce dust emission during movement of vehicles inside the plant roads	2008	17
13.	Installation of Alkali start-up scrubber for 300 MTPD sulfuric acid plant to reduce SO_2 emission during start-up	2008	99
14.	Installation of new bag-filter in place of existing bag-filter at wharf new silo for reduction of fugitive dust emissions	2008	14
15.	Replacement of bag-filter at old ball mill of rock-grinding unit	2007	18
16.	Installation of Air Pre-heater in Trains 'B' & 'C' of complex plant	2006	320
17.	Installation of Air Pre-heater in Train-A of complex plant	2006	165
18.	Installation of Telescopic chute (2 Nos.) at Wharf New Silo	2006	13
19.	Installation of pipe conveyor at wharf in place of cross conveyor.	2005	175
20.	Hazardous waste handling and disposal system	2004	5
21.	Installation of telescopic chute at rock phosphate storage godown.	2004	30
22.	Replacement of fume gas scrubber at phosphoric acid plant.	2004	150
23.	Installation of de-dusting system at rock phosphate unloading area.	2004	10
24.	Installation of new Screw Unloader System in place of gantry grab bucket system and construction of silo and overhead pipe conveyor at wharf	2003	2000
25.	Installation of new bag filter for storage silo at wharf area in place of existing one.	2003	20
26.	New SO_2 on-line analyser was installed at sulphuric acid plant.	2002	8

Sl. no.	Measure	Year installed	Cost Rs. Lakhs
27.	Ground rock transfer system from rock grinding station to phosphoric acid plant modified from pneumatic system to pipe conveying system.	2002	200
28.	Bag-filter was installed on inclined conveyor at wharf area	2002	2
29.	Additional bag-filter at rock grinding unit	2001	5
30.	New scrubbing system for train 'B'	2001	550
31.	New scrubbing system for train 'A'	2000	550
32.	Telescopic chutes (2 nos.)	2000	12
33.	Pollution control equipment for new complex Train 'C'	2000	833
	TOTAL Rs. / lakhs		**8106**

BEFORE THE YEAR 2000			
34.	Telescopic chute, emulsifier nozzles & bag filter at wharf area	1999	10
35.	Renewal of bag filter at rock grinding	1998	15
36.	Molten sulfur handling facility	1997	1050
37.	Reinstallation of high capacity effluent pumps	1996	50
38.	Renewal of bag filter at phosphoric acid plant	1995	5
39.	Green-belt development	-	20
40.	Revamping of sulfuric acid plant converter & use of high active ring shaped catalyst.	1994	450
41.	Modification of recirculation pumps in effluent treatment plant	1994	35
42.	Fluorine recovery unit	1994	320
43.	LPG/Naphtha fumes monitor for leak detection	1993	4
44.	Installation of continuous pH meter for DT acid cooler exit water	1993	2
45.	Replacement of cold heat exchanger	1992	80
46.	Fluoride analyser for effluent analysis	1992	4
47.	Installation of continuous SO_2 analyser for stack in sulfuric acid plant	1992	15
48.	Installation of dust control system in bagging plant	1992	12
49.	Installation dust control system at wharf silo	1992	13
50.	Monitoring equipment viz. High volume samplers, ammonia sensors.	1990 & 91	5
51.	Effluent recycle scheme in complex plant	1989	12
52.	Construction of effluent treatment plant	1989	250
53.	Installation of bag filters in rock grinding plant	1989	12
54.	Construction of new F.A.T. in sulfuric acid plant	1989	20
55.	Extension of fume scrubber stack in phosphoric acid plant	1988	6
56.	Installation of fumes scrubber in phosphoric acid plant	1987	30
57.	Installation of mist eliminator candles in sulfuric acid plant	1987	10
58.	Rinse water recovery scheme in utilities plant	1984	3

BEFORE THE YEAR 2000			
59.	Replacement of conventional catalyst to more active type (Ring)	1980	60
60.	Conversion of sulfuric acid process to DCDA technology	1975	250
61.	High efficiency Venturi scrubbers in complex plant	1967	27
62.	Dust cyclones in complex plant	1967	6
63.	Installation of dust cyclones in phosphoric acid plant	1967	4
	TOTAL	**Rs/ lakhs**	**2796**

Note: Total investment from 1967 to 2012-13 = 13631 lakhs
Capital investment for 2013-14 = 312 lakhs
Investments in 2014-15 = 400 lakhs
In 2015-16 = 177 lakhs
In 2016-17 = 160 lakhs
In 2017-18 = 1248 lakhs
In 2018-19 = 220 lakhs
In 2019-20 = 1440 lakhs
In 2020-21 = 395 lakhs
In 2021-22 = 2026 lakhs