F. No. J-11011/113/2016-IA.II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan
Jor Bagh Road, Aliganj,
New Delhi – 110003
E-mail: r.sundar@nic.in
Tel: 011-24695304

Dated: 23rd June, 2021

To

Shri. Santosh Kumar Singh,
Head - Environment,
M/s. Adani Enterprises Limited,
Adani House, Near Mithakali Circle,
Navrangpura, Ahmedabad – 380 009,
Tel: No. +91 90990 55009; Email: prasad.suryarao@adani.com

Subject: Greenfield Copper Refinery Plant (1.0 MTPA) project of **M/s. Adani Enterprises Limited** located at Adani Ports and Special Economic Zone land in Village(s) Siracha and Navinal, Taluka Mundra, **District Kutch, Gujarat – Amendment in Environment Clearance–regarding.**

Sir,

1. This refers to application of M/s. Adani Enterprises Limited made vide proposal no. IA/GJ/IND/86812/2016 dated 17/05/2021 along with Form 4, addendum EIA/EMP report and sought for amendment in Environment Clearance accorded by the Ministry vide letter no. J–11011/113/2016/IA.II(I) dated 08/05/2020.

2. The proposal was considered by the EAC (Industry 1) in its 37th meeting held on 31st May - 1st June, 2021. The EAC proceedings of the said meeting is furnished as below:

Details submitted by the project proponent

3. M/s. Adani Enterprises Limited (AEL) has obtained EC vide letter no. J-11011/113/2016/IA.II(I) dated 08/05/2020 from MoEF&CC, New Delhi for setting up of Greenfield Copper Refinery Plant (1.0 MTPA) in Adani Ports and Special Economic Zone land located at Village(s) Siracha and Navinal, Taluka Mundra, District Kutch, Gujarat. The project activity is yet to be started at the site.

4. The instant proposal of M/s. AEL is regarding optimization of the land requirement of proposed project which involves inclusion of additional new land plots & exclusion of forest land. This optimization of land & proposed new layout has following benefits:

   i. Dhaneshwari River was passing through the earlier layout of 1.0 MTPA. The land on the west of the river Dhaneshwari has been excluded in the new proposed layout of 1.0 MTPA and it passes along the project boundary; and

   ii. Optimization of layout by including additional unutilized land has made it possible to exclude forest land for the project. Layout has become more compact providing improvement in internal traffic movement.

5. Land optimization:

Type of Land	As per EC Granted (1.0 MTPA)	Proposed Amendment for EC(1.0 MTPA)	Remarks
Industrial Land	154.19 ha	206.11 ha	M/s. Adani Port and SEZ Limited has already obtained stage I Forest Clearance vide letter no. 8-04/2016-FC dated 16/11/2018 for diversion of 1576.81 ha forest land for setting up of SEZ and industrial park. Out of 1576.81 ha forest land, 102.39 ha was earmarked for copper smelter project which have been excluded now. Further, there is a reduction in project area by 50.47 ha (256.58 – 206.11).
Forest Land	102.39 ha	0	
Total Land	256.58 ha (APSEZ Area 154.19 ha + Forest Land 102.39 ha)	206.11	

Type of Land	As per EC Granted (1.0 MTPA)	Proposed Amendment for EC(1.0 MTPA)	Remarks
As per EC granted	256.58	147.22 (71.43%)	*147.22 ha of old land (As per EC granted) has retained in the new amendment layout which is approximately 71.4% of the current layout. Further, another 58.89 ha new land has been added to lay out. Thus, total revised land requirement is 206.11 ha. In this regard, M/s. AEL has entered in to MoU with M/s. Adani Ports and SEZ Limited on 11/05/2021 stating that M/s. Adani Ports and SEZ Limited will make available 206.11 ha to M/s. AEL on long term lease basis.*
New Land added	0	58.89 (28.57%)	

6. The location, co-ordinates and survey for the revised land of 206.11 ha is furnished as below:

Location and Survey numbers	APSEZ area in Siracha and Navinal villages. Siracha village 295/Paiki 6/Paiki 3, 295/Paiki 6/Paiki 4, 125/2,126, 135, 137, 138/1, 140, 141/P, 142/P,143/P, 144/1 Part, 144/2 Part, 145 Part, 136,138/2, 139/1, 139/2Un-surveyed land, old ACL and diverted Mundra forest land part. Navinal Village: 223/Part, 224 part and 225(APSEZ)

Co-ordinates

Corner Point	Latitude	Longitude
A	22°49'10.07"N	69°34'10.04"E
B	22°49'33.01"N	69°34'09.05"E
C	22°49'50.53"N	69°34'46.27"E
D	22°49'49.11"N	69°35'01.20"E
E	22°48'56.80"N	69°35'14.26"E
F	22°48'57.09"N	69°35'01.31"E
G	22°48'50.14"N	69°34'44.08"E
H	22°48'15.07"N	69°34'33.40"E
I	22°48'45.19"N	69°34'10.53"E

7. The revised land use break-up for the copper project furnished as below. PP reported that revised project site is located outside the CRZ area, there is no reclaimed land, mudflats, mangroves and sand dunes in the project site. The distance of mangroves from the project site boundary is about 170 meters on the Southern side of the project site.

Sr. No.	Description	As per granted EC (1.0 MTPA)		Proposed Amendment for EC (1.0 MTPA)	
		Area in ha	%	Area in ha	%
A	**Plant Area**	**67.58**	**26.34%**	**61.86**	**30.01%**
1	Smelter	20.23	7.88%	20.03	9.72%
2	Refinery, CCR & PMRP	14.97	5.83%	13.75	6.67%
3	Sulphuric acid plant	5.67	2.21%	7.52	3.65%
4	Phosphoric acid Plant & AlF3	20.23	7.88%	14.77	7.17%
5	Effluent Treatment Plant (ETP)	6.48	2.53%	5.79	2.81%
B	**Utility Area**	**15.38**	**5.99%**	**13.83**	**6.71%**
1	O_2 plant – Ancillary 1	2.43	0.95%	4.02	1.95%
2	Incoming SUB- Ancillary 2	3.24	1.26%	2.66	1.29%
3	Water Reservoir- Ancillary 3	3.24	1.26%	1.62	0.79%
4	Officers, fire station, change room	2.43	0.95%	1.95	0.95%
5	Material Stores & Fabrication Yard	2.43	0.95%	2.15	1.04%
6	LPG & Fuel Storage	1.61	0.63%	1.43	0.69%
C	**Waste Storage Area**	**55.04**	**21.45%**	**17.58**	**8.53%**
1	Slag yard	13.35	5.20%	5.69	2.76%
2	Gypsum	28.34	11.05%	3.58	1.74%
3	Secured land fill (SLF)	12.14	4.73%	7.69	3.73%
4	Scrap yard	1.21	0.47%	0.62	0.30%
D	**Other Area**	**118.58**	**46.22%**	**112.84**	**54.75%**
1	Roads and Support Infrastructure	33.99	13.25%	40.7	19.75%
2	Greenbelt	84.59	32.97%	72.14	35.00%
	Total Area (A+B+C+D)	**256.58**	100.00%	**206.11**	**100.00%**

8. As per the letter dated 03/03/2021furnished by the Irrigation department of Govt. of Gujarat, the HFL of Dhaneshwari River during monsoon period near sircha village is 3.054 m with reference to the MSL of the period. The elevation of the project site is 7-10 m above Mean Sea Level. The distance of observed HFL and project boundary is more than 50 m.

9. Due to the change in layout of the project site, there will be shift of location earmarked for the stacks. PP has carried our revised AAQ and the results are furnished as below:

Parameter	As Per Earlier EC 1.0 MTPA				After Proposed Amendment 1.0 MTPA				NAAQS 2009
	Predicted Incremental Conc. 2016				Predicted Incremental Conc. 2016				
	Max GLC	Baseline (Navinal)	Resultant	2.5 km, NE	Max GLC	Baseline (Navinal)	Resultant	2.5 km, NE	
PM	1.96	60.6	62.56		1.53	60.6	62.13		100
SO_2	13.90	32.1	46.00		10.60	32.1	42.70		80
NO_x	0.47	23.1	23.57		0.32	23.1	23.42		80

Note: ***All values are in $\mu g/m^3$***
The maximum predicted GLC's are added to 2016 baseline data. The resultant GLC's are found to less after revised emission standards.

10. In addition to the land optimization, PP also proposed for modification in the environment norms as given below:
    i. SO_2 from sulphuric acid plant stack will be less than 0.7 kg SO_2/T of H_2SO_4 and from FGD stack will be less than 400 mg/Nm^3.
    ii. Fluoride from phosphoric acid plant stack will be less than 10 mg/Nm^3.
    iii. Plant is designed based on "ZERO Liquid Discharge".
    iv. Change in location of Secured Land Fill and Phospogypsum storage area will confirm to the CPCB guidelines.

Sulphuric Acid Plant (SAP)	Flue Gas Desulphurization (FGD)
SO_2 emission ~ 0.7 kg/ Ton of Sulphuric Acid produced; from the residual off-gases coming out of sulphuric acid plant stack will be achieved by: a) Catalytic converter bed configuration of 3+2 with Double Conversion Double Absorption (DCDA) process, for the sulphuric acid plant; with SO_2 conversion efficiency of 99.92%. b) Use of super caesium sulphuric acid catalyst in the final bed of the catalytic converter, which has better conversion efficiency at a temperature lower than 400 ^{0}C. c) Tail gas scrubber to scrub the residual gases coming out of the final absorption tower.	SO_2 emission of ~ 400 mg/Nm^3 from the residual off-gases coming from Flue Gas Desulphurization system connected to treat smelter secondary off gases, following system will be achieved by: a) Scrubber with amine technology will be installed for treating secondary off gases from smelting furnace, PS converter and slag cleaning furnace. b) Lime scrubber will be installed for treating secondary off gases from electric furnace, anode Furnace and scrap melting furnace.

11. Due to the aforesaid changes, PP has sought for following amendments as well as corrigendum in the EC dated 08/05/2020.

A. Amendment in the EC dated 08/05/2020

EC Para No.	Details as per EC Granted dated 08/05/2020	Proposed Amendment in EC
5	The total land required for the project is **256.58 ha**, out of which 154.19 ha is non-forest land already notified as SEZ and is in the possession of APSEZ, 102.39 ha forest land applied for diversion by APSEZ for which Stage 1 clearance has been granted in Nov 2018. Project proponent has provided MoU with APSEZ; that the proposed land will be provided by APSEZ for this project after receiving necessary clearances. The proposed project is outside the CRZ. The Dhaneswari (Danesri Nadi) River passes through the project area, which will be maintained. A greenbelt along with a safety zone (towards river bank with gabion, gully plugs to avoid erosion of the bank, if any) of 15 meter wide will be developed along the sides of the Dhaneswari (Danesri Nadi) River.	The total land required for the project is **206.11 ha**, which is existing within notified SEZ Mundra of APSEZ. Project proponent has provided MoU with APSEZ for leasing the land. The proposed project is outside the CRZ. The Dhaneswari (Danesri Nadi) River passes **alongside of the** project area, which will **be** maintained. A greenbelt along with a safety zone (towards river bank with gabion, gully plugs to avoid erosion of the bank, if any) of 50-meter-wide will be developed along the sides of the Dhaneswari (Danesri Nadi) River.
6	The topography of the area is flat and slightly undulating and ranges between 22°48'13.26"N to 22°50'01.88"N Latitude and 69°33'34.74"E to 69°35'08.42"E Longitude in Survey of	The topography of the area is flat and slightly undulating and ranges between **22°48'15.07" N to 22°49'50.53"N Latitude** and **69°34'09.05"E to 69°35'14.26"E Longitude** in Survey of

EC Para No.	Details as per EC Granted dated 08/05/2020	Proposed Amendment in EC
	India topo sheet No. F42J9 & 10, at an elevation of 7-10 m AMSL. The ground water table ranges between 2-10 m below the land surface during the post-monsoon season and 2-20 m below the land surface during the pre-monsoon season. The stage of groundwater development in Mundra Taluka is reported to be 63.28% and designated as safe areas as per Technical Report Series, Ground Water Brochure of Kutch District by CGWB – 2013. No groundwater is proposed for either construction or operation phase of the project.	India toposheet No. F42J9 & 10, at an elevation of 7-10 m AMSL. The ground water table ranges between 2-10 m below the land surface during the post-monsoon season and 2-20 m below the land surface during the pre-monsoon season. The stage of groundwater development in Mundra Taluka is reported to be 63.28% and designated as safe areas as per Technical Report Series, Ground Water Brochure of Kutch District by CGWB – 2013. No groundwater is proposed for either construction or operation phase of the project.
23	It has been reported that approx. 53,000 tons per annum of waste will be generated due to the project, out of which approx. 7,300 tonnes per annum will be recycled through authorised recyclers and within the process. Rest will be stored in the secured landfill (SLF). It has been envisaged that an area of **89.8ha** will be developed as green belt around the project facilities to attenuate the noise levels and trap the dust generated due to the project development activities.	It has been reported that approx. 53,000 tons per annum of waste will be generated due to the project, out of which approx. 7,300 tonnes per annum will be recycled through authorised recyclers and within the process. Rest will be stored in the secured landfill (SLF). It has been envisaged that an area of **72.14ha** will be developed as green belt around the project facilities to attenuate the noise levels and trap the dust generated due to the project development activities.
25	The capital cost of the project is Rs. **10,000** Crores and the capital cost for environmental protection measures is proposed as Rs. **1050.11** Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs. **52.75** Crores.	The capital cost of the project is Rs. **11,000** Crores and the capital cost for environmental protection measures is proposed as Rs. **1150.11** Crores. The annual recurring cost towards the environmental protection measures is proposed as Rs. **58.3** Crores.
28	In line with Office Memorandum dated 1st May 2018 of MoEF&CC regarding Corporate Environment Responsibility, an amount of approx. **Rs. 58.02 Cr** has been earmarked for Corporate Environment Responsibility (CER) and allocated for relevant development programmes to address education, community health, Sustainable livelihood, Community environment and Community rural infrastructure issues in the area based on public hearing issues and social impact assessment.	In line with Office Memorandum dated 1st May 2018 of MoEF&CC regarding Corporate Environment Responsibility, an amount of approx. **Rs. 60.5 Cr** has been earmarked for Corporate Environment Responsibility (CER) and allocated for relevant development programmes to address education, community health, Sustainable livelihood, Community environment and Community rural infrastructure issues in the area based on public hearing issues and social impact assessment.
29	Greenbelt will be developed in **89.80 ha** which is about **35%**of the total acquired area. Peripheral greenbelt, consisting of at	Greenbelt will be developed in **72.14 ha** which is about **35%**of the total acquired area. Peripheral greenbelt, consisting of at

EC Para No.	Details as per EC Granted dated 08/05/2020	Proposed Amendment in EC
	least 3 tiers around plant boundary will be developed as greenbelt and green cover as per CPCB/ MoEF&CC, New Delhi guidelines. Local and native species will be planted with a density of 2500 trees per hectare	least 3 tiers around plant boundary will be developed as greenbelt and green cover as per CPCB/ MoEF&CC, New Delhi guidelines. Local and native species will be planted with a density of 2500 trees per hectare.
30	The proponent has mentioned that there is no court case or violation under EIA Notification to the project or related activity.	Original Appeal No. 35/2020 (WZ) in NGT, Western Zone, Pune filed on 29.07.2020 by Appellant Kheti Vikas Seva Trust.

B. Corrigendum to the EC dated 08/05/2020

AEL has already intimated MoEF&CC vide letter no. AEL/Copper/EC/MoEF&CC/ 2020/June-1 dated 05/06/2020 regarding corrigendum for EC Conditions as given below:

Sl. No.	EC Reference	Conditions of EC	Corrigendum Proposed for EC
II	**Air quality monitoring and preservation**		
(x)	Page 13; Section II, Point - x	Adopt measures to recover fluoride gas from electrolytic cells and recycle the same in the process.	*Not applicable for Copper Plant and **hence need to be deleted**.*
III	**Water quality monitoring and preservation**		
(vii)	Page 13; Section III, Point - viii	The project proponent shall make efforts to minimise water consumption in the **steel** plant complex by segregation of used water, practicing cascade use and by recycling treated water.	*The project proponent shall make efforts to minimise water consumption in the **copper** plant complex by segregation of used water, practicing cascade use and by recycling treated water.*
V	**Energy Conservation measures**		
(i)	Page 14; Section V, Point - i	The project proponent shall provide waste heat recovery system (pre-heating of combustion air) at the flue gases.	*The project proponent shall provide waste heat recovery system at the flue gases.*
IX	**Corporate Environment Responsibility**		
(iii)	Page 15; Section IX, Point - iii	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organisation.	*A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly **report** to the head of the organisation.*
(iv)	Page 15; Section IX, Point - iv	All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the **Aluminium** Industry shall be implemented.	*All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the **Copper** Industry shall be implemented.*

12. The PP has not proposed for change in project configuration as well as production capacity of the existing EC.

13. The sulphur and fluorine emission after the proposed amendment is given below:

S No	Particulars	Unit	As per EC Granted	Proposed Amendment in EC
1.	Sulfur emission	TPA	5,386	**3,641**
2.	Fluorine emission	TPA	50	**33**

14. Summary of court case related to the project under consideration:
Original Appeal No. 35/2020 (WZ) in NGT, Western Zone, Pune filed on 29.07.2020 by Appellant Kheti Vikas Seva Trust. The matter is presently under sub-judice.

15. It has been reported by PP that, there is no violation under EIA Notification, 2006/court case/show cause/direction related to the project under consideration.

16. Name of the EIA Consultant: Vimta Labs, Hyderabad. [S.No.136 in the List of ACOs with their Certificate / Extension Letter no. Rev. 10, May 13, 2021].

Observations of the Committee

17. The Committee noted the following:
    i. EC was granted on 8.5.2020. Project construction has not started as yet.
    ii. EC has been challenged in NGT Pune by Kheti Vikas Seva Trust. Presently, the matter is sub-judice. However, as informed by the PP, no stay has been granted by the Hon'ble NGT or by any other court.
    iii. The EAC found that the addendum EIA/EMP report is in order reflecting the present environmental concerns and the projected scenario for all the environmental components arising out of the proposed project with respective mitigation measures. The EAC also noted that the baseline data reported and incremental GLC due to the proposed project were within NAAQ standards.
    iv. PP has proposed for modification in the emission limits as given below:
        a. SO_2 from sulphuric acid plant stack will be reduced from the earlier proposed level of 1.0 Kg SO_2 / T of H_2SO_4 to less than 0.7 kg SO_2/T of H_2SO_4 and from FGD stack will be less than 400 mg/Nm^3 in place of earlier proposed 600 400 mg/Nm^3.
        b. Fluoride from phosphoric acid plant stack will be less than 10 mg/Nm^3 in place of 20 mg/Nm^3.

Recommendations of the Committee

18. In view of the foregoing and after delineations, the Committee recommended for amendment /corrigendum in the EC dated 08/05/2020 as mentioned at paragraph 11 above and subject to stipulation of following additional specific conditions:
    i. Project proponent shall abide by the all orders and judicial pronouncements, made from time to time passed by Hon'ble National Green Tribunal, Western Zone in Original Appeal No. 35/2020 (WZ).
    ii. Particulate matter emission from all the stacks shall not exceed 30 mg/Nm^3.
    iii. The Mangrove and Mudflat conservation plan submitted to Deputy Conservator of Forests, Gujarat Forest Department shall be implemented in a time bound manner and periodic compliance status in this regard shall be submitted to the Regional Office of the MoEF&CC along with the six monthly compliance report.
    iv. Sulphur and Fluorine emission pollution shall not exceed 3641 TPA for sulphur and 33 TPA for Fluorine as committed by the project proponent.
    v. SO_2 from sulphuric acid plant stack will be less than 0.7 kg SO_2/T of H_2SO_4 and from Flue Gas Desulphurization (FGD) stack will be less than 400 mg/Nm^3 as committed by the project proponent.
    vi. Fluoride from phosphoric acid plant stack will be less than 10 mg/Nm^3 as committed by

the project proponent.

Decision of MoEF&CC

19. The undersigned is directed to inform that Ministry of Environment, Forest and Climate Change has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the Expert Appraisal Committee (Industry-1) hereby decided for amendment in the EC dated 08/05/2020, amendment in the EC as mentioned at paragraph no. 11 above and subject to stipulation of following additional specific conditions:
    i. Project proponent shall abide by the all orders and judicial pronouncements, made from time to time passed by Hon'ble National Green Tribunal, Western Zone in Original Appeal No. 35/2020 (WZ).
    ii. Particulate matter emission from all the stacks shall not exceed 30 mg/Nm^3.
    iii. The Mangrove and Mudflat conservation plan submitted to Deputy Conservator of Forests, Gujarat Forest Department shall be implemented in a time bound manner and periodic compliance status in this regard shall be submitted to the Regional Office of the MoEF&CC along with the six monthly compliance report.
    iv. Sulphur and Fluorine emission pollution shall not exceed 3641 TPA for sulphur and 33 TPA for Fluorine as committed by the project proponent.
    v. SO_2 from sulphuric acid plant stack will be less than 0.7 kg SO_2/T of H_2SO_4 and from Flue Gas Desulphurization (FGD) stack will be less than 400 mg/Nm^3 as committed by the project proponent.
    vi. Fluoride from phosphoric acid plant stack will be less than 10 mg/Nm^3as committed by the project proponent.
20. The project proponent shall obtain fresh Environment Clearance in case of change in scope of the project if any.

21. This issues with the approval of the Competent Authority.

Yours faithfully,

23/1/24

(Sundar Ramanathan)
Scientist 'E'

Copy to: -

1. Secretary, Department of Environment, Government of Gujarat, Secretariat, Gandhinagar.
2. PCCF & Chief Wildlife Warden, Govt. of Gujarat State, Aranya Bhavan, Near Central Water Commission, Near CH-3 Circle, CH Rd, Sector 10A, Sector 10, Gandhinagar – 382010.
3. Regional Officer, Ministry of Environment, Forest and Climate Change, Integrated Regional Office, E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal – 462016.
4. Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
5. Member Secretary, Central Ground Water Authority, A-2, W3, Curzon Road Barracks, K.G. Marg, New Delhi-110001.
6. Chairman, Gujarat State Pollution Control Board, Sector 10-A, Gandhi Nagar - 382043, Gujarat.
7. District Collector, Kutch District, Gujarat.
8. Guard File/Record File/Monitoring File.
9. MoEF&CC Website.

23/1/24

(Sundar Ramanathan)
Scientist 'E'

F. No. J-11011/113/2016-IA.II(I)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira ParyavaranBhawan
Jor Bagh Road, Aliganj,
New Delhi - 110003
E-mail: dirind-moefcc@gov.in
Tel: 011-24695368
Dated: 08.05.2020

To

Shri Santosh Kumar Singh
Head Environment
Adani Enetrprises Ltd,
Sambhav House,
Judges Bangalow Road, Bodekdev,
Ahmedabad, Gujarat - 380015

Subject: Greenfield Copper Refinery Plant (1.0 MTPA) project of **M/s Adani Enterprises Ltd** located at Adani Ports and Special Economic Zone land in village(s) Siracha and Navinal, Taluka Mundra, District Kutch, **Gujarat– Environmental Clearance** – regarding.

Sir,

This is reference to your online application vide proposal No. IA/GJ/IND/86812/2016 dated 6th December 2018 in the prescribed Form -2 along with copies of EIA/EMP report and other documents seeking Environmental Clearance (EC) under the provisions of the EIA Notification, 2006 for the project mentioned above. The proposed project activity is listed at Sl. No. 3(a) Metallurgical Industries (Ferrous and Non-ferrous) under Category "A" EIA Notification, 2006 and the proposal is appraised at Central level.

Details submitted by the project proponent

2. The Greenfield Copper Refinery of One Million Tons Per Annum (1.0 MTPA) project by M/s Adani Enterprises Limited, proposed at Adani Ports and Special Economic Zone land in village(s) Siracha and Navinal, Taluka Mundra, District Kutch, State Gujarat was initially received in the Ministry on 21st April 2016 for obtaining Terms of Reference (ToR) as per EIA Notification, 2006. The project was appraised by the Expert Appraisal Committee (Industry) [EAC(I)] during its 6thmeeting held on 4thMay 2016 and prescribed ToRs to the project for undertaking detailed EIA study for obtaining environmental clearance. Accordingly, the Ministry of Environment, Forest & Climate Change had prescribed ToRs to the project on 21st June 2016 vide Lr. No. F. No. J-11011/113/2016 IA.II (I).

3. The project of M/s. Adani Enterprises Limited located in Villages of Siracha and Navinal, TalukaMundra, District Kutch, State of Gujarat is for setting up of a new Copper Refinery for production of one million tonnes per annum (1.0 MTPA) of Copper Cathode. The detail of overall plant configuration as below:

Sr. No.	Plant	Units	Overall Plant Configuration
1	Copper Smelter Plant	TPA	9,00,000
2	Copper Refinery Plant	TPA	10,00,000

3	Continuous Cast Copper Rod Plant	TPA	5,00,000
4	Copper Scrap & E-Scrap Melting Facility	TPA	1,00,000
5	Sulphuric Acid Plant	TPA	30,00,000
6	Phosphoric Acid Plant (100% P_2O_5)	TPA	5,00,000
7	Aluminum Fluoride Plant	TPA	30,000
8	Oxygen (Industrial) Plant	TPM	96,000
9	Precious Metal Recovery Plant		
a	Gold	TPA	50
b	Silver	TPA	500
c	Selenium	TPA	288
10	Waste Heat recovery boiler based power plant	MW	40

4. The proposed capacity for different products for new site area as below:

Sr. No.	Products	Units	Overall Plant Capacity
I	**Main Products**		
1	Copper Cathode	TPA	10,00,000
2	Sulphuric Acid (> 98%)	TPA	30,00,000
3	Continuous Cast Copper Wire Rod	TPA	5,00,000
4	Gold	TPA	50
5	Silver	TPA	500
6	Phosphoric Acid (as 100% P_2O_5)	TPA	5,00,000
7	Aluminum Fluoride	TPA	30,000
II	**By-Products**		
8	Anode Slime	TPM	500
9	Selenium	TPM	24
10	Platinum Group Metal (PGM) Concentrate	TPM	6
11	Ferro Sand/ Iron Silicate - Copper Slag (Granulated)	TPM	1,72,761
12	Phosphogypsum	TPM	2,08,334
13	Hydro Fluro Silicic Acid (~20% as H_2SiF_6)	TPM	2,500
14	Copper Telluride	TPM	42
15	Tellurium	TPM	8
16	Nickel	TPM	16
17	Bismuth Bisulphate	TPM	120
18	Calomel (Mercury Chloride)	TPM	18
19	Mercury	TPM	16
20	CCR Mill Scale	TPM	50

5. The total land required for the project is 256.58 ha, out of which 154.19 ha is non-forest land already notified as SEZ and is in the possession of APSEZ, 102.39 ha forest land applied for diversion by APSEZ for which Stage 1 clearance has been granted in Nov 2018. Project proponent has provided MoU with APSEZ; that the proposed land will be provided by APSEZ for this project after receiving necessary clearances. The proposed project is outside the CRZ. The Dhaneswari River (DanesriNadi) passes through the project area, which will maintained. A greenbelt along with a safety zone (towards river bank with gabion, gully plugs to avoid erosion of the bank, if any) of 15 meter wide will be developed along the sides of the Dhaneswari River (DanesriNadi).

6. The topography of the area is flat and slightly undulating and ranges between 22°48'13.26"N to 22°50'01.88"N Latitude and 69°33'34.74"E to 69°35'08.42"E Longitude in Survey of India topo sheet No. F42J9 & 10, at an elevation of 7-10 m AMSL. The ground water table ranges between 2-10 m below the land surface during the

post-monsoon season and 2-20 m below the land surface during the pre-monsoon season. The stage of groundwater development in Mundra Taluka is reported to be 63.28% and designated as safe areas as per Technical Report Series, Ground Water Brochure of Kutch District by CGWB – 2013. No groundwater is proposed for either construction or operation phase of the project.

7. No National Park/Wildlife Sanctuary/Biosphere Reserve/Tiger Reserve etc. are reported to be located within the study area, i.e., within 10 km from the boundary of the project site. The area also does not report to form corridor for Schedule-I fauna. Floral species are mainly dominated by *Prosopis juliflora* and *Acacia senegal*. The faunal species were categorized as per conservation status of Wildlife Protection Act, 1972 and reveals presence of Schedule-I species including peacock in the study area. Mapping of mangroves present in the study area has been carried out. Closest mangrove distribution is located at 170 metres (on bank of Kotdi –II creek) from Southern most boundary of the proposed project site. Wildlife management and mangrove conservation plan has been proposed with outlay of Rs.372 Lakhs. This outlay for conservation also includes intervention proposed for mudflats conservation.

8. The raw material requirement and it's handling system in the proposed project is as given below:

Sr. No.	Raw Materials	Unit	Quantity	Storage	Mode of Transport
1	Copper Concentrate	TPA	31,42,924	Covered Warehouse	Pipe Conveyor/ Road
2	Copper Content in Copper Scrap & E-Scrap	TPA	2,08,402	Covered Warehouse	Container/ Road
3	Rock Phosphate	TPA	17,50,000	Covered Warehouse	Pipe Conveyor/ Road
4	Aluminum Hydrate	TPA	37,500	Covered Warehouse	Road
5	Silica Sand	TPA	3,14,292	Covered Warehouse	Road
6	Quartz	TPA	1,41,432	Covered Warehouse	Road
7	Limestone	TPA	78,573	Covered Warehouse	Road
8	Quick Lime	TPA	60,000	Covered Warehouse	Road

9. The fuel requirementand its handling system in the proposed project is as given below.

Sr. No	Fuel	Unit	Quantity	Storage	Mode of transport
1	LPG/ PNG	TPD	100	As per PESO Guideline	Road / Pipeline
2	Furnace Oil	TPD	300	Carbon Steel (CS) Tank with roof cone	Road
3	High Speed Diesel	KLPD	50	Carbon Steel (CS) Tank with roof cone	Road
4	Met Coke	TPD	100	Covered Shed	Road
5	Coal/ Pet Coke	TPD	100	Covered Shed	Road

10. During the manufacturing Process, following waste will be generated, which will be recycled in the process or will be sent to authorised recyclers:

Sr. No.	Waste	Units	Quantity	Storage	Mode of transport for Dispatch
1	Nickel Sulphate/ Nickel Carbonate Sludge	TPA	1,860	Covered Shed	Road
2	Copper Arsenate and Arsenical Cathode	TPA	2,130	Covered Shed	Road
3	Used Oil	KLA	200	Tank	Road
4	Oil Sludge	TPA	50	Steel/ Plastic Container	Road

11. During the manufacturing Process, following Hazardous waste will be generated and will be stored in Secured Landfill (SLF) designed in accordance with CPCB Guidelines:

Sr. No.	Hazardous Waste	Units	Quantity	Storage	Mode of transport for storage
1	Arsenic Bearing ETP sludge	TPA	43,348	Secured Landfill (SLF)	Covered Truck
2	Spent Catalyst from Sulphuric Acid Plant	KLA	400	Secured Landfill (SLF)	Truck
3	Spent resins from DM, RO & Refinery Plant	KLA	20	Secured Landfill (SLF)	Truck
4	Salts from Multi Effect Evaporator/ MVR	TPA	9240	Secured Landfill (SLF)	Truck

12. The proposed project to adopt pyrosmelting technology and electro refining process to produce copper cathode. The sulphur dioxide generated during the smelting of copper concentrate is converted into sulphuric acid by Double Conversion Double Absorption (DCDA) process. Part of the sulphuric acid is utilized for production of phosphoric acid within the plant.Secondary gases from the smelter plant and tail gases from sulphuric acid plant will be treated in flue gas desulfurization (FGD) system based on SO_2 Abatement technology / system; Regenerative absorption solvent technology and Lime slurry scrubbing system.

13. Copper concentrate will be largely imported from various countries across the globe such as Chile, Peru, Brazil, Australia, Africa, Indonesia, etc. and Rock Phosphate is imported from countries like Jordan, Morocco, Australia, Israel, Senegal, etc. Copper Concentrate & Rock Phosphate will be unloaded from the ship and transported to the covered warehouse either by pipe conveyor system or through covered trucks. The principal raw material for the production of copper metal is copper concentrate blend containing about 25-35% copper, 25-34% Sulphur, iron 25-35% and 7-10% moisture. Approximately, 3 LTPA copper scrap and electronic scrap is also used as input to proposed copper smelting plant, copper scrap & E-Scrap melting facility.

14. The major steps in copper extraction are as follows:

    - Blending of different grades of concentrates.

- Smelting of concentrate in flash smelting furnace to produce an intermediate copper rich product known as "matte" containing 58 - 63% copper.
- Converting of liquid matte to blister copper (98 - 99% Cu) in Pierce-Smith converter.
- Copper slag from flash smelting furnace and PS Converter will be further treated to recover copper through electric furnace and slag cleaning furnace.
- Fire refining of blister copper to produce anode copper (99.5% Cu) in anode furnace and casting of the anodes and
- Electrolytic refining of anodes to produce copper cathodes (99.99% Cu).

15. In the process of extraction of copper metal, sulphuric acid is recovered as a by-product from the off-gases generated from the smelting and converting furnaces. A part of sulphuric acid produced is utilized for phosphoric acid production and rest will be sold in the market based on market requirement. Phosphoric Acid (PA) Plant uses sulphuric acid produced within the plant and imported rock phosphate to produce Phosphoric Acid. Phosphoric Acid is largely used in fertiliser industries to make phosphatic fertilizers. During the Phosphoric Acid manufacturing process fluorine gases scrubbed with water to recover as hydro fluro silicic acid (FSA) through scrubbing system. FSA is one of the major raw materials for production of fluoride based chemicals. Hydro fluro silicic acid generated from phosphoric acid plant will be partly sold to fluoride based industries and rest will be converted in value added Aluminum Fluoride. Aluminum Fluoride plant will be using FSA produced in PA Plant and Aluminum Hydrate to produce Aluminum Fluoride. Aluminum Fluoride is an important material in production of Aluminum Metal. Aluminum fluoride produced will be sold to aluminium manufacturing companies. The precious metal in the form of anode slime is collected during electrolytic refining of copper will be processed to produce gold, silver and Platinum Group of Metals (PGM) concentrate as well as recovery of minor metals such as Tellurium, Bismuth, Nickel, etc). The copper cathode produced from copper refinery will be melted and drawn in the form of copper wire rod on continuous basis from a continuous casting and rolling machine. Copper rod will be of various sizes as per market requirement such as 8 to 32 mm.

16. The wastewater generated from copper smelter, sulphuric acid plant, copper refinery, Phosphoric Acid Plant and Aluminum Fluoride plant will be treated in state of art effluent treatment facility. Plant is designed on Zero Liquid Discharge concept and hence no process water or treated effluent will be discharged outside the plant boundary. Treated effluent will be reused within the plant operations; excess if any will be sent ZLD facility comprising of a Reverse Osmosis plant and rejects from RO plant will be handled in Multi effect evaporator/ MVR system to achieve ZLD. Product from RO plant will be recycled to copper refinery plant to reduce the fresh water consumption. Rain water harvesting & storm water management system will be put in place.

17. The targeted production capacity of the proposed project is 1.0 MTPA. The major technological units envisaged for the copper refinery project are as given below:

    - Raw material handling system
    - Flash Smelting furnace
    - Pierce smith converter
    - Electric Furnace
    - Ferro Sand Cleaning Furnace (FSCF)
    - Copper scrap & E-scrap melting system
    - Anode furnace & anode casting wheel
    - Off gas handling
    - Sulphuric acid plant

- Oxygen plant
- Copper Refinery Plant
- Precious metal recovery plant
- Continuous cast copper wire rod plant
- Phosphoric acid plant
- Aluminum fluoride plant
- Flue gas desulfurization Unit
- Effluent Treatment Plant (ETP)
- Utilities like Power, Water, Air and Fuel

18. The water requirement of the project is estimated as approx. 29,700 m^3/day of freshwater requirement will be obtained from the desalination plant of Adani Port Special Economic Zone (APSEZ). Approx. 4,400 m^3 /day treated water from ETP & STP will be utilized for plant operation. No groundwater shall be used for either construction or operation phase of the project.

19. The power requirement of the project is estimated as 300 MW, out of which 260 MW will be obtained from the APSEZ through MUPL and 40 MW would be generated from waste heat recovery system.

20. Baseline Environmental Studies were conducted during post-monsoon and partly winter season i.e. from 1st October to 31st December, 2016 Ambient air quality monitoring has been carried out at eight locations and the data indicated: PM_{10} (35.2 to 84.2 $\mu g/m^3$), $PM_{2.5}$ (19.2 to 43.9 $\mu g/m^3$), SO_2 (14.8 to 42.6 $\mu g/m^3$) and NO_x (13.1 to 32.8 $\mu g/m^3$). The results of the modeling study indicates that the maximum increase of GLC for the proposed project is 0.52 $\mu g/m^3$ with respect to the $PM_{2.5}$, 1.27 $\mu g/m^3$ with respect to the PM_{10}, 10.37 $\mu g/m^3$ with respect to the SO_2 and 0.23 $\mu g/m^3$ with respect to the NO_x.

21. Ground water quality has been monitored in eight locations in the study area and analysed. pH: 7.3 to 7.8, Total Hardness: 125 to 392 mg/l, Chlorides: 282.6 to 978.4 mg/l, Fluoride: 0.9 to 1.5 mg/l. Heavy metals are within the limits. Surface water samples were analysed from four locations. pH: 7.2 to 8.0; DO: 5.6 to 5.9 mg/l and BOD: <3 mg/l. COD from 60 to 80 mg/l.

22. Noise levels are in the range of 48.5 to 56.6 dB(A) for daytime and 42.3 to 48.8 dB(A) for night time.

23. It has been reported that approx. 53,000 tons per annum of waste will be generated due to the project, out of which approx. 7,300 tonnes per annum will be recycled through authorised recyclers and within the process. Rest will be stored in the secured landfill (SLF). It has been envisaged that an area of 89.80 ha will be developed as green belt around the project facilities to attenuate the noise levels and trap the dust generated due to the project development activities.

24. It has been reported that the Consent to Establish/Consent to operate from the Gujarat State Pollution Control Board / Pollution Control Committee will be obtained as per applicable requirements after obtaining the Environmental Clearance.

25. The capital cost of the project is Rs. 10,000 Cr. and the capital cost for environmental protection measures is proposed as Rs. 1050.11 Cr. The annual recurring cost towards the environmental protection measures is proposed as Rs. 52.75 Cr.

26. During operation phase, the employment generation from the proposed project will be for 5000 nos of people through direct and indirect employment.

27. The Public hearing of the project was held on 29th April 2017at Community Premises Centre Samajvadi Opposite Tunda Primary Schoolunder the chairmanship of Additional

District Magistrate and Resident Additional Collector for setting up of Copper Refinery plant of 1.0 MTPA, under the chairmanship of Additional District Magistrate and Resident Additional Collector. The issues raised during public hearing were mainly about Employment, Environmental Protection and Rural infrastructure.

28. In line with Office Memorandum dated 1st May 2018 of MoEF&CC regarding Corporate Environment Responsibility, an amount of approx. Rs. 58.02Cr has been earmarked for Corporate Environment Responsibility (CER) and allocated for relevant development programmes to address education, community health, Sustainable livelihood, Community environment and Community rural infrastructure issues in the area based on public hearing issues and social impact assessment.

29. Greenbelt will be developed in 89.80 ha which is about 35% of the total acquired area. Peripheral greenbelt, consisting of at least three tiers around plant boundary will be developed as greenbelt and green cover as per CPCB/MoEF&CC, New Delhi guidelines. Local and native species will be planted with a density of 2500 trees per hectare.

30. The proponent has mentioned that there is no court case or violation under EIA Notification to the project or related activity.

31. EIA Consultant Organization:M/s. Vimta Labs, Hyderabad.

32. The proposal was considered in the EAC meetings held during 9-11th January 2019, 22-23rd August 2019, 23-24th December 2019 and 24-25th February 2020.

Observations of the Committee:

33. Project Proponent has submitted the additional information sought by EAC on 07.08.2019. A subcommittee visited the site and surroundings during 9- 10th December 2019. Site visit report was placed in the EAC meeting held during 23-24th December 2019. Based on the additional information sought by EAC, the project proponent submitted reply on 05.02.2020 and the proposal was reconsidered in the EAC meeting held during 24-25th February 2020. During the detailed deliberations, the Committee has made the following observations.

i. The project was designed based on the Outotec Flash Smelting Technology due to operational ease with safer working conditions, environmental friendliness, low off gas volumes, higher sulphur dioxide capture rate, process heat recovery and utilisation.

ii. Sulphur balance along with regenerative amine based sulphur dioxide scrubbing and lime slurry based scrubbing for flash smelting, Pierce Smith (ps) converter, tail gases from sulphuric acid plant (sap), anode furnace, slag cleaning furnace and scrap melting furnace has been detailed in the report.

iii. Waste Heat Recovery System for power generation of 40 MW and corresponding reduction of carbon footprint estimation was given in the report. It is mentioned that carbon dioxide saving is equivalent to 244 kg/t of Copper.

iv. Fifteen-meter-wide greenbelt around solid waste storage (copper slag, gypsum, hazardous waste), and water spray system are proposed to control dust emissions.

v. A detailed copper slag and phosphor-gypsum utilization plan was given by the Project Proponent (PP) based on the reconnaissance survey of global data. The PP came out with number of industrial/ construction/infrastructure applications of copper slag and a number of applications of phosphor-gypsum in manufacturing of cement, as a fertilizer in agriculture, in construction/ infrastructure building for which prospective users/buyers shall be identified after stabilization of the project. Desired quality of user specifications of the copper slag/phosphor gypsum can be achieved only after

stabilization of process parameters of plant and its aging in the stacking yard. Further, the Project Proponent requested MoEF&CC to make a policy decision for utilization of Phospho-Gypsum by circular economy concept similar to one adopted in China and Japan.

vi. Technical design details of Phospho-gypsum stack yard were provided in the report.

vii. Wildlife conservation plan was revised with detailed mitigation measures, monitoring and inclusion of a component for mangrove conservation.

viii. Stormwater management plan was revised with peak rainfall data in the study area, i.e 467.9mm/day in the year 1959. Accordingly, rainwater harvesting structures had been proposed by the PP for roof top rainwater harvesting.

ix. Occupational Health and Safety (OHS) monitoring plan was given based on the ICMR-NIOH and ILO guidelines including specific tests to be conducted plant wise (smelter/refinery/CCR plant/ PMR plant/SAP/PAP/AF3 plant/ETP).

x. Air Quality Modeling study was revised using CALPUFF with all site features like sea and land interaction, topography, upper air data, Internal Thermal Boundary Layer, Coastal Fumigation, etc. to predict the ground level concentrations likely to impact the nearby habitation as well as long term and long range transport of emissions.

xi. Water balance for entire complex was revised and water requirement is reduced from 32800 KLD to 29678 KLD.

xii. HIRA was revised for all acids storage including Hydro Fluro Silicic acid with Quantitative Risk Assessment (QRA) and Societal Risk (F-N Curve).

xiii. Certified copy of the Board Resolution with respect to reporting non-compliances and violations was furnished.

xiv. Details of mist eliminators matching the mist particle size was furnished in order to adopt the mechanism to control acid mist from stacks.

xv. Interlocking systems for control of sulphur dioxide emissions, case by case, during start up, normal plant operations and poor converter reaction were detailed in the report.

xvi. A detailed plan of precautionary measures for use during construction phase with mitigation measures was provided.

Recommendations of the Committee

34. In view of the foregoing, and after detailed deliberations, the committee recommended the proposal for Environmental Clearance with the following specific conditions in addition to the general conditions as per the Ministry's Office Memorandum No. 22-34/2018-III dated 9/8/2018.

i. Dust collected from Waste Heat Recovery Boiler (WHRB), Electrostatic Precipitators (ESPs) and bag filters in copper smelter shall be recycled back into copper smelter plant and dust collected from bag filters in phosphoric acid plant shall be recycled back into phosphoric acid plant.

ii. Off-gases from smelting, settling and converting furnaces in copper smelter plants shall be cleaned and converted to sulphuric acid by Double Conversion Double Absorption (DCDA) Process Technology. Super Caesium based catalyst shall be used in final bed of the catalytic converter of Sulphuric Acid Plant to achieve maximum conversion ratio.

iii. Sulphur dioxide emission from the residual off-gases of sulphuric acid plant shall not be more than 1.0 kg/ Tonne of Sulphuric acid produced.

iv. Sulphur dioxide emission from stack of flue gas desulphurisation system shall not be more than 600 mg/Nm^3.

v. Stack height for sulphuric acid plant and flue gas desulfurization system shall not be less than 150 meters.

vi. Acid mist from stack of Sulphuric acidplant shall be maintained at less than 50 mg / Nm^3 in compliance to the standards vide Notification G.S.R 354 (E) dated 02.05.2011.

vii. On-line stack monitoring system shall be installed for sulphur dioxide from the Sulphuricacidplant and flue gas desulphurisation stacks, and shall be calibrated regularly.

viii. Regenerative sulphur dioxide recovery system such as scrubbing with amine shall be adopted for flue gas desulphurization for the secondary gases from flash smelter, Pierce Smith converterand for tail gases from sulphuric acid plant. Lime scrubbing system shall be adopted for flue gas desulphurization of the gases from anode furnace, slag cleaning furnace and scrap melting furnace.

ix. Six numbers of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) shall be installed to monitor the ambient air quality in and around the plant in consultation with SPCB.

x. Mercury (Hg) in ambient air shall be monitored in addition to air quality parameters prescribed in the National Ambient Air Quality Standards (NAAQS) 2009 in the study area and report shall be submitted along with six monthly compliance report to Regional Office of the Ministry.

xi. Company shall install multistage fluoride scrubbing system in phosphoric acid plant so that the total Fluoride emissions from the Phosphoric acid plant shall not exceed the prescribed standards, i.e., 20 mg/Nm^3. On-line stack monitoring facilities for Fluorides shall be provided. Calibration report shall be preserved.

xii. Water requirement for the proposed copper refinery plant shall not be more than 30,000 m^3/day. Water audit shall be carried out on annual basis and report submitted to Regional Office of the Ministry.

xiii. The entire wastewater generated including effluents from the gas cleaning plant, sulphuric acid plant, secondary gas scrubbers of copper smelter, Copper refinery, Precious Metal Recovery plant, Leachate collected from Secured Land Fill (SLF), shall be treated in effluent treatment plant (ETP). Treated effluent shall be recycled and reused in plant operations.

xiv. Leachate from Phospho-gypsum storage area shall be recycled back into and utilized in the Phosphoric Acid Plant.

xv. Reverse osmosis plant along with multi effect evaporator (MEE)/ MVR system shall be installed to achieve Zero Liquid Discharge.

xvi. Domestic effluent shall be treated in sewage treatment plant (STP) and treated wastewater shall be used for the development of green belt.

xvii. The ground water quality all around the solid waste storage of Copper Slag, Phospho-Gypsum and SLF shall be monitored, in pre monsoon and post monsoon periods for pH, Arsenic and Fluoride levels along with other parameters and data submitted to the Ministry's Regional Office.

xviii. Interlocking systems in the plant shall be provided to control the impact of accidental releases, if any. Records of such events including response and corrective actions shall be maintained.

xix. Wildlife Management Plan for conservation of active mud flats, and mangroves plantation in 500 ha (50 ha per year in 10 years) and for development on the bank of Kotdi-I, Kotdi-II and Baradimata Creek systems shall be implemented in consultation with Gujarat Forest Department. Year-wise implementation records including of spending of funds earmarked (Rs 372 Lakh) shall be maintained and submitted to Regional Office of the Ministry.

xx. All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Copper smelters shall be implemented.

xxi. During construction phase, housing for construction labour shall be provided with all necessary infrastructure and facilities such as green fuel for cooking, toilets, STP, safe drinking water, medical health care, etc. The housing may be in the form of temporary structures.

xxii. Additional plantation shall be done against the trees removed from non-forest area during the project construction phase in 1:10 ratio.

xxiii. A wall of at least nine feet height shall be constructed around the project boundary. Thick green belt of minimum 20 m width shall be developed around the project boundary to arrest fugitive dust emissions.

xxiv. Greenbelt of 15 m width shall be developed all around the solid waste storage area.

xxv. Care shall be taken to restrict cutting of trees to the minimum. For every tree cut minimum of 10 trees or the number as required by the state policy, whichever is more shall be planted.

xxvi. There will be bridges across the two land parcels for accessibility. Flow of water from the DhaneshwariNadi shall not be disturbed. A green belt along with safety zone (towards riverbank with gabion and gully plugs to avoid erosion of plant if any) 50 meter wide shall be developed along the banks (side) of DhaneshwariNadi and 100 meter wide wherever storage of solid waste is proposed.This green belt would be developed by giving protection to the area and planting local species so that a natural ecosystem is created that may promote wilderness.

xxvii. The runoff water from the raw material storage area, slag and phospho gypsum storage yard shall be treated, and recycled. The sludge from the treatment facilities shall be recycled back into plant or stored at the designated place.

xxviii. In order to mitigate salinity ingression, provision for groundwater recharging by rainwater shall be provided inside and outside the plant at identified locations based on the lithological parameters derived through scientific investigation.

xxix. Water consumption shall not be more than 8.39 m^3/tonne of Copper cathode and that for the entire complex shall not be more than 10.83 m^3/tonne of Copper cathode after stabilization of the plant. . Water Audit shall be conducted once in a year for entire complex comprising all the individual units and report submitted to Regional Office of the Ministry.

xxx. Energy Consumption of the proposed plant shall not exceed 11 GJ/T of Copper Cathode at 100% capacity utilization and 17 GJ/T Copper for entire Complex after stabilization of the plant. Energy audit shall be conducted once in a year for entire complex and all the individual units, and the report submitted to Regional Office of the Ministry.

xxxi. A statement on carbon footprint including the quantum of equivalent carbon dioxide being emitted by the existing plant operations will be prepared annually through some reputed institution. every year and report submitted to the Regional Office of the Ministry annually.

xxxii. Copper Concentrate and Rock Phosphate shall be transported from port to plant by closed conveyor system or by covered trucks with tarpaulin. Dust extraction/ suppression system to handle dust will be provided at the truck unloading point. The storage facility shall be in a covered shed and paved with concrete. Sludge collected from tyre washing facility shall be recycled into copper smelter.

xxxiii. Copper Slag/Ferro Sand/Iron Silicate shall be transported through a covered conveyor system from point of generation to designated storage facility for reusing the same.

xxxiv. Action plan to reduce storage of Copper Slag in five years after stabilization of the plant shall be prepared and implemented in a progressive manner so that at, any stage, the stacked quantity shall not exceed 5 years cumulative quantity. Records shall be maintained and annual audit shall be conducted and report submitted to the Regional Office of the Ministry.

xxxv. Project Proponent shall obtain approval from Gujarat Pollution Control Board for location and design of the Secured Land Fill (SLF) and Phospho-gypsum Storage Yard sites. Piezo wells shall be installed based on the hydrogeology study around these sites for regular monitoring of groundwater quality.

xxxvi. Phospho-gypsum and Chemical gypsum (generated in ETP) shall be transported through covered trucks to the storage facility and for further reuse and utilisation.

xxxvii. Action plan to reduce storage of Phospho-gypsum and Chemical gypsum in 5m years shall be prepared and implemented in a progressive manner.so that, at any stage, the stacked quantity shall not exceed 5-year cumulative quantity. Records shall be maintained, and annual audit shall be conducted, and the report submitted to Regional Office of the Ministry.

xxxviii. The Chemical Gypsum and Phospho-gypsum shall be analyzed for their chemical characteristics before considering their storage provision i.e. in same or separate land fill site.

xxxix. Arsenic bearing sludge generated in ETP, Spent Catalyst from Sulphuric Acid Plant, Spent resins from DM, RO and Refinery Plant, salts from Multi Effect Evaporator/ MVR, other toxic substances (if any) shall be stored in Secured Land Fill (SLF) with prior approval from Gujarat Pollution Control Board. Records of the generation and storage of these hazardous material shall be maintained.

xl. The 10 m wide approach road all along wastes storage yard shall be paved. Arrangements shall be made to spray water on the solid waste dumps of SLF and Phospho Gypsum Yard to control fugitive dust emission.

xli. Spent oil and batteries shall be disposed of and lifted by the authorized recyclers.

xlii. Occupational health surveillance for employees and workers shall be carried out on a regular basis as recommended by ICMR-NIOH study report and records shall be maintained as per Indian Factories Act. Health survey should be carried out every year regularly in all the villages within three kilometres from the boundary of the project site. Survey reports will have to be regularly submitted to the Regional office of the Ministry.

xliii. Corporate Environment Responsibility (CER) Fund shall be utilised in the various projects as submitted in the field of education, livelihood, drinking water arrangement, water shed management, outside project boundary green belt development, etc. during 5 years of project construction time. CER Projects progress report shall be submitted to Regional Office of the Ministry in six monthly compliance report.

xliv. Separate drainage system shall be laid to carry storm water runoff and industrial wastewater. Due precaution shall be taken while laying the drainage system to avoid mixing of storm water and industrial wastewater.

Decision of MoEF&CC

35. The Ministry has considered the above recommendations of EAC and here by decided to accord Environmental Clearance to the proposed 'Greenfield Copper Refinery Plant (1.0 MTPA) of **M/s Adani Enterprises Ltd** at Adani Ports and Special Economic Zone land in village(s) Siracha and Navinal, Taluka Mundra, District Kutch, Gujarat along with specific conditions at para 35 and following sector specific general conditions.

I. Statutory compliance:

i. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.

ii. The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report.

iii. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State pollution Control Board/ Committee.

iv. The project proponent shall obtain the necessary permission from the Central Ground Water Authority, in case of drawl of ground water / from the competent authority concerned in case of drawl of surface water required for the project.

v. The project proponent shall obtain authorization under the Hazardous and other Waste Management Rules, 2016 as amended from time to time.

II. Air quality monitoring and preservation

i. The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission with respect to standards prescribed in Environment (Protection) Rules 1986 vide G.S.R 742 (E) dated 30thAugust 1990 and thereafter amended vide G.S.R 46 (E) dated 3rd February 2006 (Aluminium); S.O. 3305 (E) dated 7thDecember 2015 (Thermal Power Plants) as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories.

ii. The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter through labs recognised under Environment (Protection) Act, 1986.

iii. The project proponent shall install system to carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM_{10} and $PM_{2.5}$ in reference to PM emission, and SO_2 and NOx in reference to SO_2 and NOx emissions) within and outside the plant area at least at four locations (one within and three outside the plant area at an angle of 120°each), covering upwind and downwind directions.

iv. The project proponent shall submit monthly summary report of continuous stack emission and air quality monitoring and results of manual stack monitoring and

manual monitoring of air quality /fugitive emissions to Regional Office of MoEF&CC, Zonal office of CPCB and Regional Office of SPCB along with six-monthly monitoring report.

v. Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.

vi. The project proponent shall provide leakage detection and mechanised bag cleaning facilities for better maintenance of bags.

vii. Pollution control system in the plant shall be provided as per the CREP Guidelines of CPCB.

viii. Sufficient number of mobile or stationery vacuum cleaners shall be provided to clean plant roads, shop floors, roofs, regularly.

ix. Ensure covered transportation and conveying of ore, coal and other raw material to prevent spillage and dust generation.

x. Adopt measures to recover fluoride gas from electrolytic cells and recycle the same in the process.

xi. Ventilation system shall be designed for adequate air changes as per ACGIH document for all tunnels, motor houses

III. Water quality monitoring and preservation

i. The project proponent shall install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 (G.S.R 742 (E) dated 30thAugust 1990 and further amended vide G.S.R 46 (E) dated 3rd February 2006(Aluminium); S.O. 3305 (E) dated 7thDecember 2015(Thermal Power Plants) as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories.

ii. The project proponent shall monitor regularly ground water quality at least twice a year (pre and post monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognised under Environment (Protection) Act, 1986 and NABL accredited laboratories.

iii. The project proponent shall submit monthly summary report of continuous effluent monitoring and results of manual effluent testing and manual monitoring of ground water quality to Regional Office of MoEF&CC, Zonal office of CPCB and Regional Office of SPCB along with six-monthly monitoring report.

iv. Adhere to 'Zero Liquid Discharge'

v. Sewage Treatment Plant shall be provided for treatment of domestic wastewater to meet the prescribed standards.

vi. Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.

vii. The project proponent shall practice rainwater harvesting to maximum possible extent.

viii. The project proponent shall make efforts to minimise water consumption in the steel plant complex by segregation of used water, practicing cascade use and by recycling treated water.

IV. Noise monitoring and prevention

i. Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.

ii. The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time

V. Energy Conservation measures

i. The project proponent shall provide waste heat recovery system (pre-heating of combustion air) at the flue gases.

ii. Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly;

iii. Provide LED lights in their offices and residential areas.

VI. Waste management

i. Used refractories shall be recycled as far as possible.

ii. A plan for 100 % utilisation of phosphogypsum generated shall be implemented. Under the action plan, MOU with shall be signed with potential buyers including cement companies for supply of phosphogypsum.

iii. The waste oil, grease and other hazardous waste shall be disposed of as per the Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016

iv. Kitchen waste shall be composted or converted to biogas for further use.

VII. Green Belt

i. Green belt shall be developed in an area equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant

ii. The project proponent shall prepare GHG emissions inventory for the plant and shall submit the programme for reduction of the same including carbon sequestration including plantation.

VIII. Public hearing and Human health issues

i. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

ii. The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms of Factory Act.

iii. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

iv. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

IX. Corporate Environment Responsibility

i. The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 1st May 2018, as applicable, regarding Corporate Environment Responsibility.

ii. The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating

procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest /wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.

iii. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization

iv. All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Aluminium Industry shall be implemented.

X. Miscellaneous

i. The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

ii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

iii. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

iv. The project proponent shall monitor the criteria pollutants level namely; PM_{10}, SO_2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.

v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.

vi. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

vii. The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

viii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

ix. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.

x. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).

xi. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xii. The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xiii. The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xiv. The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.

xv. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

xvi. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

(A.K.Agrawal)
Director

Copy to:

1) **Secretary**, Department of Environment, Government of Gujarat, Secretariat Gandhinagar.
2) **Deputy Director General of Forests(C),**Ministry of Environment, Forest and Climate Change, Regional Office (WZ), E-5 KendriyaParyavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal – 462016.
3) **Chairman,** Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office complex, East Arjun Nagar, New Delhi-1100032.
4) **Member Secretary**, Central Ground Water Authority, 18/11, Jamnagar House, Man Singh Road, New Delhi-110011.
5) **Chairman**, Gujarat State Pollution Control Board, Sector 10-A, Gandhi Nagar - 382043, Gujarat.
6) **District Collector**, Kutch District, Gujarat.
7) Guard File/Record File/Monitoring File.
8) MoEF&CC Website.

(A.K.Agrawal)
Director