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NAGARJUNA
GROUP
Nagarjuna Fertilizers
and Chemicals Limited

NFCL/ENV/MOEFCC/HR/01/2017

19th April 2017

To,
The Joint Director,
Ministry of Environment, Forests and Climate Change,
1st and 2nd Floor, HEPC Building,
No.34, Cathedral Garden Road,
Nungambakkam,
Chennai – 600034

Subject : Compliance of condition prescribed by MoEF&CC, RO, Chennai – Submission of Half Yearly Report – Reg.

Reference : Your Letter vide No. EP/12.1/2012-13/49/AP/1000, dated 11.08.2015

Dear Sir,

With reference to the above letter, monitoring data pertaining to analysis of Treated liquid effluent, Groundwater, Ambient air, Fugitive emissions, Stack emissions, Meteorological parameters, Solid waste generation & handling in the complex is being forwarded for the period October 2016 – March 2017.

Thanking you

Yours faithfully
for Nagarjuna Fertilizers and Chemicals Limited

G V S Anand

G V S Anand
Senior General Manager (Operations)

Cc: Environmental Engineer,
Regional Office,
A. P. Pollution Control Board, Kakinada

1.0 Treated Liquid Effluent Data

The data for the period, October 2016 – March 2017, is enclosed at Annexure – III (1 nos. of pages)

2.0 Ambient Air Quality

The data for the period, October 2016 – March 2017, is enclosed at Annexure – IV (5 nos. of pages)

3.0 Groundwater Quality data

The data for the period, October 2016 – March 2017, is enclosed at Annexure – V (6 nos. of pages)

4.0 Fugitive Emission data

The data for the period, October 2016 – March 2017, is enclosed at Annexure – VI (6 nos. of pages)

5.0 Stack Emission data

The data for the period, October 2016 – March 2017, is enclosed at Annexure – VII (6 nos. of pages)

6.0 Information on Ammonia Sensor in Ammonia Storage Tank area

Ammonia sensors installed in Ammonia Storage Tank area are working normally.

7.0 Solid waste generation & their handling in the complex

Plant → / Waste ↓	Ammonia		CDR Plant	Urea		Off-sites
	I	II		I	II	
Spent Catalyst	ü	ü	---	---	---	---
CDR Reclamation Waste	---	---	ü	---	---	---
Activated Carbon	ü	ü	ü	---	---	ü
Waste Oils	ü	ü	ü	ü	ü	ü
PTP Sludge	---	---	---	---	---	ü

7.1 Spent Catalyst: The list of catalysts being used in the plant is given in the Annexure I and II. Plant I and II were commissioned in 1992 and 1998 respectively. Once the catalyst is exhausted, it is removed from the processes and is oxidized completely. This reduces the risk of fire hazard. After removal, the catalyst is packed in the drums containing impervious lining and clearly labeled as "Spent Catalyst - Hazardous". The spent catalyst drums are stored in covered, protected and earmarked area.

7.2 CDR Reclamation Waste: In the Carbon Di Oxide Recovery plant KS1 solution is being used as absorbing media. SO_2 and NO_x in the flue gas react with the KS1 solution and forms Heat Stable Salts (HSS). When the HSS content in the solution reaches to the maximum limit, HSS can be removed by Caustic reclamation. During this period, 4.815 MT of CDR Reclamation waste was disposed to APPCB authorized vendor.

7.3 Spent Activated Carbon: Activated carbon is used in Ammonia plant I & II, CDR Plant and in DM plant. Activated carbon is used to purify K_2CO_3 solution and KS1 solution in Ammonia plant and CDR Plant respectively. In DM plant, it is used to adsorb Chlorine and Organic matter from water. Activated carbon removed from the above processes is packed in containers with proper lining. The containers are labeled prominently and stored in a well-marked, covered and protected area.

7.4 Waste Oils: In the complex, Oil is used mainly for lubrication purposes. During this period, 9.699 MT of used oil was disposed to CPCB authorized vendor.

7.5 PTP Sludge: Raw water received from the Samalakot Summer reservoir contains clay and other impurities. These are filtered in the pretreatment plant. The sludge generated from the pretreatment section is alluvial in nature and is fertile. The fertility of the generated sludge is taken as an advantage for filling low lying areas in the green belt.

Ammonia Plant – I

Catalyst for	Catalyst Name	Supplier
a) Desulphurisation		
(i) Hydrogenation	TK-10 / TK-250 / TK-261	Halder Topsoe A/S
(ii) ZnO Absorbers	KATALCO$_{JM}$32-4 + PURASPEC $_{JM}$2020	Johnson Matthey
	C7-6 Actisorb S2 / C7-DD Actisorb S6	Sudchemie
b) Reforming		
(i) Primary	R-67R-7H / R-67-7H	Halder Topsoe A/S
(ii) Secondary	RKS-2 / RKS-2-7H	Halder Topsoe A/S
a) Shift Conversion		
(i) H.T.	CDC-93C	Projects Development India Ltd.
(ii) L. T.	LSK-2 / LK-821-2 / LK-823	Halder Topsoe A/S
d) Methanation	PK-5	Halder Topsoe A/S
e) Ammonia Synthesis		
(i) Normal	KM1	Halder Topsoe A/S
(ii) Pre-Reduced	KM1R	Halder Topsoe A/S

Ammonia Plant – II

Catalyst for	Catalyst Name	Supplier
a) Desulphurisation		
(i) Primary	TK-550	Halder Topsoe A/S
(ii) Secondary		
(a) Hydrogenation	TK-10 / TK-250 / TK-261	Halder Topsoe A/S
(b) ZnO Absorbers	$KATALCO_{JM}32-4$	Johnson Matthey
	HTZ-3 / C7-6 Actisorb S2 / KATALCOJM32-4 / C7-DD Actisorb S6	Halder Topsoe A/S / Sudchemie / JM / Sudchemie
b) Reforming		
(i) Primary	R-67R-7H / R-67-7H	Halder Topsoe A/S
(ii) Secondary	C14-2 LDP/ JM54-8Q	Sudchemie / Johnson Matthey
c) Shift Conversion		
(i) H.T.	CDC-93C	Projects Development India Ltd.
(ii) L.T.	LSK-2 / LK-821-2	Halder Topsoe A/S
d) Methanation	PK-5	Halder Topsoe A/S
e) Ammonia Synthesis		
(i) Normal	KM1	Halder Topsoe A/S
(ii) Pre-Reduced	KM1R	Halder Topsoe A/S

Treated Liquid Effluent Analysis:

Parameters	**Unit**	**Standards Prescribed by APPCB**	**Oct - 16**	**Nov - 16**	**Dec - 16**	**Jan - 17**	**Feb - 17**	**March - 17**
pH		6.5 – 8.0	7.5	7.3	7.3	7.2	7.2	7.4
Suspended Solids	mg/l	100	39	38	39	40	41	43
Dissolved Solids	mg/l	2100	1534	1615	1690	1408	1582	1637
Ammonical Nitrogen as N	mg/l	50	20.1	21.2	23.2	23.9	26.2	27.2
Nitrates as N	mg/l	10	6.2	6.3	6.4	6.4	6.5	6.5
BOD	mg/l	30	14.4	16.5	16.0	16.0	15.5	17.8
COD	mg/l	250	38.0	37.0	38.5	38.4	39.5	41.5
Oil & Grease	mg/l	10	3.2	3.3	3.3	3.4	3.5	3.4
Phosphates as P	mg/l	5	0.8	0.8	0.8	0.8	0.8	0.8
Chlorides as Cl	mg/l	1000	378	423	490	322	370	387
TKN as N	mg/l	100	40.2	42.1	46.3	47.0	52.1	54.3

All the above values are monthly averages

Ambient Air Quality Monitoring Data of Station-I

Parameter	**SO_2**	**CO**	**NO_x**	**NH_3**	**Dust**	**Rainfall**	**Wind Speed**	**Predominant Wind Direction (towards)**	**Temperature ^oC**		**Relative Humidity %**		**Barometric Pressure**
Unit	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mm	Km/hr		Min	Max	Min	Max	Mill bar
Oct' 2016	9.8	0.7	3.9	10.3	52.6	9.8	2.6	SOUTH	21.0	37.5	39	100	1010.0
Nov' 2016	9.7	0.2	16.2	32.5	60.7	9.7	4.7	SOUTH	18.0	33.5	39	100	1014.5
Dec' 2016	10.0	0.3	12.8	26.4	57.4	10.0	4.4	SOUTH	17.0	31.5	53	96	1015.2
Jan' 2017	9.9	0.3	11.7	16.4	28.8	NIL	4.0	WEST	17.0	32.0	52	96	1017.7
Feb' 2017	10.0	0.4	6.6	17.1	25.3	NIL	2.6	SOUTH	18.5	34.5	46	96	1017.6
Mar' 2017	10.2	0.3	10.8	17.1	15.8	6.5	3.8	SOUTH EAST	19.5	36.0	48	100	1011.6

All the above values are monthly averages except Rainfall, Temperature and Relative Humidity.

Ambient Air Quality Monitoring Data of Station-II

Parameter	**SO_2**	**CO**	**NO_x**	**NH_3**	**Dust**
Unit	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Oct' 2016	7.3	0.1	8.0	9.3	45.7
Nov' 2016	9.0	0.2	9.8	11.2	53.1
Dec' 2016	9.4	0.3	11.1	13.5	49.1
Jan' 2017	7.5	0.2	8.2	9.2	50.1
Feb' 2017	8.5	0.2	10.3	11.4	50.9
Mar' 2017	8.8	0.2	7.8	12.8	49.8

All the above values are monthly averages

Ambient Air Quality Monitoring Data of Station-III

Parameter	**SO_2**	**CO**	**NO_x**	**NH_3**	**Dust**
Unit	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Oct' 2016	7.6	0.2	7.7	8.1	48.9
Nov' 2016	6.6	0.2	7.7	9.6	44.1
Dec' 2016	7.4	0.2	7.1	7.9	43.2
Jan' 2017	7.0	0.2	6.8	8.5	44.2
Feb' 2017	7.1	0.1	7.9	8.2	42.5
Mar' 2017	7.9	0.3	8.0	11.3	41.3

All the above values are monthly averages

Ambient Air Quality Monitoring Data of Station-IV

Parameter	**SO_2**	**CO**	**NO_x**	**NH_3**	**Dust**
Unit	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Oct' 2016	8.0	0.2	7.5	9.0	54.1
Nov' 2016	9.4	0.2	10.2	13.6	54.2
Dec' 2016	9.1	0.2	9.7	12.2	50.7
Jan' 2017	7.5	0.2	8.2	9.7	50.4
Feb' 2017	9.7	0.2	10.0	10.4	50.1
Mar' 2017	9.0	0.2	7.0	12.4	46.0

All the above values are monthly averages

Ambient Air Quality Monitoring Data of Station-V

Parameter	**SO_2**	**CO**	**NO_x**	**NH_3**	**Dust**
Unit	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Oct' 2016	6.9	0.1	8.9	8.4	50.8
Nov' 2016	9.2	0.2	11.5	16.4	47.5
Dec' 2016	9.9	0.2	10.2	10.8	51.9
Jan' 2017	7.8	0.2	8.1	9.3	49.0
Feb' 2017	8.6	0.2	8.9	10.2	52.1
Mar' 2017	8.9	0.3	8.2	9.9	51.5

All the above values are monthly averages

Groundwater Quality Monitoring Analysis for the month of October 2016:

Area	pH	Conductivity millimhos/cm	P/M Alkalinity as $CaCO_3$ ppm	Chlorides as Cl ppm	Nitrates as NO_3 ppm	Ammonia as NH_3 ppm	Fluorides as F ppm	Total Hardness as $CaCO_3$ ppm	Calcium Hardness as $CaCO_3$ ppm
New Kakinada (Pallam Raju Nagar)	7.3	2.66	ND/304	432	28.0	1.6	1.0	628	270
Cement Godown (Pallam Raju Nagar)	7.4	3.93	ND/416	794	82.4	1.9	0.8	1124	532
Nav Bharat Public School	7.3	2.01	ND/386	172	110.6	1.1	1.1	518	284
Kondelupeta	7.4	2.84	ND/404	516	16.1	2.0	1.4	562	244
Boat Club	7.6	3.12	ND/492	524	8.3	0.8	1.2	616	176
West of NFCL	7.7	1.80	ND/382	292	4.8	2.1	0.8	264	160
Green Belt Well	7.5	2.26	ND/282	632	3.2	2.4	1.0	552	264
Ground water near ETP*	7.5	1.85	ND/260	416	2.4	3.4	0.7	134	44
Ground water near Amm. Storage*	7.6	1.92	ND/290	220	10.1	4.5	0.6	198	86
Ground water near Gate House*	7.6	1.98	ND/242	208	3.6	2.2	0.8	236	92

* Piezometric Wells

Groundwater Quality Monitoring Analysis for the month of November 2016:

Area	pH	Conductivity millimhos/cm	P/M Alkalinity as $CaCO_3$ ppm	Chlorides as Cl ppm	Nitrates as NO_3 ppm	Ammonia as NH_3 ppm	Fluorides as F ppm	Total Hardness as $CaCO_3$ ppm	Calcium Hardness as $CaCO_3$ ppm
New Kakinada (Pallam Raju Nagar)	7.3	3.09	ND/318	468	21.2	1.0	0.8	710	324
Cement Godown (Pallam Raju Nagar)	7.5	4.68	ND/462	802	76.0	1.2	1.1	1210	562
Nav Bharat Public School	7.0	1.54	ND/334	164	98.6	1.4	0.8	480	260
Kondelupeta	7.5	2.22	ND/418	482	12.4	1.2	0.6	546	228
Boat Club	7.4	2.10	ND/472	506	10.2	1.8	1.0	592	186
West of NFCL	7.6	2.16	ND/410	308	6.1	1.0	0.8	310	174
Green Belt Well	7.3	3.27	ND/306	654	3.0	2.2	1.0	614	292
Ground water near ETP*	7.6	2.30	ND/282	426	3.6	2.8	0.8	186	62
Ground water near Amm. Storage*	7.8	2.00	ND/310	232	13.4	3.6	1.0	214	110
Ground water near Gate House*	7.5	1.98	ND/230	220	4.2	2.4	0.6	242	104

* Piezometric Wells

Groundwater Quality Monitoring Analysis for the month of December 2016:

Area	pH	Conductivity millimhos/cm	P/M Alkalinity as $CaCO_3$ ppm	Chlorides as Cl ppm	Nitrates as NO_3 ppm	Ammonia as NH_3 ppm	Fluorides as F ppm	Total Hardness as $CaCO_3$ ppm	Calcium Hardness as $CaCO_3$ ppm
New Kakinada (Pallam Raju Nagar)	7.5	3.58	ND/312	472	28.4	0.8	1.0	784	336
Cement Godown (Pallam Raju Nagar)	7.4	4.10	ND/434	784	84.6	1.2	1.4	1096	528
Nav Bharat Public School	7.1	1.24	ND/352	176	102.1	2.8	0.6	382	310
Kondelupeta	7.6	2.60	ND/426	460	18.6	1.0	0.8	610	204
Boat Club	7.3	1.86	ND/450	506	8.4	2.4	1.1	564	492
West of NFCL	7.5	2.25	ND/328	354	5.6	1.8	0.8	346	194
Green Belt Well	7.4	3.42	ND/284	710	3.7	2.6	1.0	682	336
Ground water near ETP*	7.7	3.18	ND/276	452	5.2	2.4	0.6	248	92
Ground water near Amm. Storage*	7.6	2.26	ND/292	240	12.6	4.1	1.0	226	116
Ground water near Gate House*	7.6	2.10	ND/240	218	6.4	3.2	0.8	250	112

* Piezometric Wells

Groundwater Quality Monitoring Analysis for the month of January 2017:

Area	pH	Conductivity millimhos/cm	P/M Alkalinity as $CaCO_3$ ppm	Chlorides as Cl ppm	Nitrates as NO_3 ppm	Ammonia as NH_3 ppm	Fluorides as F ppm	Total Hardness as $CaCO_3$ ppm	Calcium Hardness as $CaCO_3$ ppm
New Kakinada (Pallam Raju Nagar)	7.4	3.16	ND/298	464	24.2	0.6	0.6	752	324
Cement Godown (Pallam Raju Nagar)	7.6	4.24	ND/442	792	76.0	1.6	1.2	1120	536
Nav Bharat Public School	7.3	1.58	ND/364	194	94.6	1.2	0.8	398	316
Kondelupeta	7.7	2.82	ND/430	488	16.2	2.4	0.6	626	228
Boat Club	7.5	1.98	ND/462	520	6.6	1.4	1.0	582	516
West of NFCL	7.6	2.36	ND/336	376	4.2	2.0	0.6	360	204
Green Belt Well	7.7	3.64	ND/302	734	5.0	3.2	0.8	696	348
Ground water near ETP*	7.6	3.06	ND/264	438	3.2	2.0	0.8	224	86
Ground water near Amm. Storage*	7.7	2.34	ND/308	254	10.4	3.4	0.6	238	128
Ground water near Gate House*	7.6	2.20	ND/252	232	4.6	2.8	1.0	262	120

* Piezometric Wells

Groundwater Quality Monitoring Analysis for the month of February 2017:

Area	pH	Conductivity millimhos/cm	P/M Alkalinity as $CaCO_3$ ppm	Chlorides as Cl ppm	Nitrates as NO_3 ppm	Ammonia as NH_3 ppm	Fluorides as F ppm	Total Hardness as $CaCO_3$ ppm	Calcium Hardness as $CaCO_3$ ppm
New Kakinada (Pallam Raju Nagar)	7.4	3.24	ND/304	442	24.2	0.8	0.8	772	330
Cement Godown (Pallam Raju Nagar)	7.3	3.98	ND/426	778	80.5	1.4	1.0	1108	518
Nav Bharat Public School	7.4	1.90	ND/382	186	102.4	1.0	0.6	426	326
Kondelupeta	7.5	2.74	ND/418	452	14.0	1.2	0.6	594	214
Boat Club	7.5	2.10	ND/450	504	6.2	1.6	1.2	610	508
West of NFCL	7.8	2.45	ND/364	340	3.8	2.4	0.8	372	192
Green Belt Well	7.7	3.52	ND/318	686	6.2	3.6	0.6	654	316
Ground water near ETP*	7.8	3.14	ND/284	442	2.8	2.4	1.0	232	94
Ground water near Amm. Storage*	7.6	2.28	ND/296	228	12.4	3.0	0.6	214	116
Ground water near Gate House*	7.7	2.32	ND/242	240	6.2	2.2	0.8	270	124

* Piezometric Wells

Groundwater Quality Monitoring Analysis for the month of March 2017:

Area	pH	Conductivity millimhos/cm	P/M Alkalinity as $CaCO_3$ ppm	Chlorides as Cl ppm	Nitrates as NO_3 ppm	Ammonia as NH_3 ppm	Fluorides as F ppm	Total Hardness as $CaCO_3$ ppm	Calcium Hardness as $CaCO_3$ ppm
New Kakinada (Pallam Raju Nagar)	7.6	3.28	ND/326	456	26.8	1.2	1.0	796	360
Cement Godown (Pallam Raju Nag	7.6	4.43	ND/444	802	76.8	1.2	0.9	1220	534
Nav Bharat Public School	7.2	1.64	ND/342	168	98.4	1.0	0.8	396	294
Kondelupeta	7.8	3.70	ND/478	504	18.2	1.0	1.0	922	302
Boat Club	7.5	3.82	ND/502	526	8.4	2.2	1.4	726	608
West of NFCL	7.9	2.29	ND/344	326	3.2	3.2	1.0	362	186
Green Belt Well	8.1	3.60	ND/328	704	6.6	3.8	1.0	676	324
Ground water near ETP*	7.9	3.24	ND/324	454	3.0	2.6	1.0	248	108
Ground water near Amm. Storag	7.7	2.62	ND/330	242	14.2	3.4	0.8	234	126
Ground water near Gate House*	7.8	2.42	ND/256	244	7.2	2.4	1.2	286	152

* Piezometric Wells

Work Environment Monitoring Data for the month of October 2016:

Sl. No.	Date	Location	Ammonia (NH_3) ppm	Carbon Monoxide (CO) ppm
1	24-10-16	Fire & Safety Control Room	0.1	<1
2	24-10-16	OHC	0.1	<1
3	24-10-16	Control Room (Ammonia & Urea 1)	0.1	<1
4	24-10-16	Ammonia 1 (02 Area)	0.1	<1
5	24-10-16	Ammonia 1 (03 Area) Field Cabin	0.1	<1
6	24-10-16	Ammonia 1 (04 Area) Acoustic Room	0.1	<1
7	24-10-16	Ammonia 1 (05 Area) Field Cabin	0.2	<1
8	24-10-16	Field Cabin Amm 1 (Mech. Maint.)	0.2	<1
9	24-10-16	Field Cabin (Urea 1)	0.1	<1
10	24-10-16	Field Cabin Urea 1 (Mech. Maint.)	0.3	<1
11	25-10-16	Control Room (GT-C)	0.1	<1
12	25-10-16	Control Room (Ammonia & Urea 2)	0.1	<1
13	25-10-16	Ammonia 2 (02 Area)	0.1	<1
14	25-10-16	Ammonia 2 (03 Area) Field Cabin	0.1	<1
15	25-10-16	Ammonia 2 (04 Area) Acoustic Room	0.3	<1
16	25-10-16	Ammonia 2 (05 Area) Field Cabin	0.2	<1
17	25-10-16	Field Cabin Amm 2 (Mech. Maint.)	0.2	<1
18	25-10-16	Cooling Towers 2 Field Cabin	0.2	<1
19	26-10-16	Field Cabin (Urea 2)	0.1	<1
20	26-10-16	Field Cabin Urea 2 (Mech. Maint.)	0.3	<1
21	26-10-16	Loading Area (Bagging plant)	1.1	<1
22	26-10-16	Boilers Field Cabin	0.1	<1
23	26-10-16	Control Room (Boilers)	0.2	<1
24	26-10-16	Control Room (Ammonia Storage)	0.1	<1
25	26-10-16	Control Room (Cooling Towers 1)	0.1	<1
26	26-10-16	Security Gate	0.1	<1
27	26-10-16	Distribution Office at Security Gate	0.1	<1

Work Environment Monitoring Data for the month of November 2016:

Sl. No.	Date	Location	Ammonia (NH_3) ppm	Carbon Monoxide (CO) ppm
1	23-11-16	Fire & Safety Control Room	0.1	<1
2	23-11-16	OHC	0.1	<1
3	23-11-16	Control Room (Ammonia & Urea 1)	0.1	<1
4	23-11-16	Ammonia 1 (02 Area)	0.1	<1
5	23-11-16	Ammonia 1 (03 Area) Field Cabin	0.2	<1
6	23-11-16	Ammonia 1 (04 Area) Acoustic Room	0.1	<1
7	23-11-16	Ammonia 1 (05 Area) Field Cabin	0.1	<1
8	23-11-16	Field Cabin Amm 1 (Mech. Maint.)	0.1	<1
9	23-11-16	Field Cabin (Urea 1)	0.1	<1
10	23-11-16	Field Cabin Urea 1 (Mech. Maint.)	0.3	<1
11	24-11-16	Control Room (GT-C)	0.1	<1
12	24-11-16	Control Room (Ammonia & Urea 2)	0.1	<1
13	24-11-16	Ammonia 2 (02 Area)	0.1	<1
14	24-11-16	Ammonia 2 (03 Area) Field Cabin	0.1	<1
15	24-11-16	Ammonia 2 (04 Area) Acoustic Room	0.2	<1
16	24-11-16	Ammonia 2 (05 Area) Field Cabin	0.1	<1
17	24-11-16	Field Cabin Amm 2 (Mech. Maint.)	0.1	<1
18	24-11-16	Cooling Towers 2 Field Cabin	0.2	<1
19	24-11-16	Field Cabin (Urea 2)	0.2	<1
20	25-11-16	Field Cabin Urea 2 (Mech. Maint.)	0.1	<1
21	25-11-16	Loading Area (Bagging plant)	1.2	<1
22	25-11-16	Boilers Field Cabin	0.1	<1
23	25-11-16	Control Room (Boilers)	0.1	<1
24	25-11-16	Control Room (Ammonia Storage)	0.2	<1
25	25-11-16	Control Room (Cooling Towers 1)	0.1	<1
26	25-11-16	Security Gate	0.1	<1
27	25-11-16	Distribution Office at Security Gate	0.1	<1

Work Environment Monitoring Data for the month of December 2016:

Sl. No.	Date	Location	Ammonia (NH_3) ppm	Carbon Monoxide (CO) ppm
1	26-12-16	Fire & Safety Control Room	0.1	<1
2	26-12-16	OHC	0.1	<1
3	26-12-16	Control Room (Ammonia & Urea 1)	0.1	<1
4	26-12-16	Ammonia 1 (02 Area)	0.1	<1
5	26-12-16	Ammonia 1 (03 Area) Field Cabin	0.2	<1
6	26-12-16	Ammonia 1 (04 Area) Acoustic Room	0.2	<1
7	26-12-16	Ammonia 1 (05 Area) Field Cabin	0.2	<1
8	26-12-16	Field Cabin Amm 1 (Mech. Maint.)	0.2	<1
9	26-12-16	Field Cabin (Urea 1)	0.1	<1
10	26-12-16	Field Cabin Urea 1 (Mech. Maint.)	0.3	<1
11	27-12-16	Control Room (GT-C)	0.2	<1
12	27-12-16	Control Room (Ammonia & Urea 2)	0.1	<1
13	27-12-16	Ammonia 2 (02 Area)	0.1	<1
14	27-12-16	Ammonia 2 (03 Area) Field Cabin	0.1	<1
15	27-12-16	Ammonia 2 (04 Area) Acoustic Room	0.5	<1
16	27-12-16	Ammonia 2 (05 Area) Field Cabin	0.4	<1
17	27-12-16	Field Cabin Amm 2 (Mech. Maint.)	0.2	<1
18	27-12-16	Cooling Towers 2 Field Cabin	0.3	<1
19	27-12-16	Field Cabin (Urea 2)	0.1	<1
20	27-12-16	Field Cabin Urea 2 (Mech. Maint.)	0.1	<1
21	28-12-16	Loading Area (Bagging plant)	0.8	<1
22	28-12-16	Boilers Field Cabin	0.1	<1
23	28-12-16	Control Room (Boilers)	0.1	<1
24	28-12-16	Control Room (Ammonia Storage)	0.1	<1
25	28-12-16	Control Room (Cooling Towers 1)	0.1	<1
26	28-12-16	Security Gate	0.1	<1
27	28-12-16	Distribution Office at Security Gate	0.1	<1

Work Environment Monitoring Data for the month of January 2017:

Sl. No.	Date	Location	Ammonia (NH_3) ppm	Carbon Monoxide (CO) ppm
1	25-01-17	Fire & Safety Control Room	0.1	<1
2	25-01-17	OHC	0.1	<1
3	25-01-17	Control Room (Ammonia & Urea 1)	0.1	<1
4	25-01-17	Ammonia 1 (02 Area)	0.1	<1
5	25-01-17	Ammonia 1 (03 Area) Field Cabin	0.2	<1
6	25-01-17	Ammonia 1 (04 Area) Acoustic Room	0.3	<1
7	25-01-17	Ammonia 1 (05 Area) Field Cabin	0.2	<1
8	25-01-17	Field Cabin Amm 1 (Mech. Maint.)	0.2	<1
9	25-01-17	Field Cabin (Urea 1)	0.4	<1
10	25-01-17	Field Cabin Urea 1 (Mech. Maint.)	0.2	<1
11	26-01-17	Control Room (GT-C)	0.1	<1
12	26-01-17	Control Room (Ammonia & Urea 2)	0.2	<1
13	26-01-17	Ammonia 2 (02 Area)	0.2	<1
14	26-01-17	Ammonia 2 (03 Area) Field Cabin	0.1	<1
15	26-01-17	Ammonia 2 (04 Area) Acoustic Room	0.4	<1
16	26-01-17	Ammonia 2 (05 Area) Field Cabin	0.5	<1
17	26-01-17	Field Cabin Amm 2 (Mech. Maint.)	0.3	<1
18	26-01-17	Cooling Towers 2 Field Cabin	0.2	<1
19	26-01-17	Field Cabin (Urea 2)	0.1	<1
20	26-01-17	Field Cabin Urea 2 (Mech. Maint.)	0.2	<1
21	27-01-17	Loading Area (Bagging plant)	0.4	<1
22	27-01-17	Boilers Field Cabin	0.1	<1
23	27-01-17	Control Room (Boilers)	0.1	<1
24	27-01-17	Control Room (Ammonia Storage)	0.1	<1
25	27-01-17	Control Room (Cooling Towers 1)	0.1	<1
26	27-01-17	Security Gate	0.1	<1
27	27-01-17	Distrubution Office at Security Gate	0.1	<1

Work Environment Monitoring Data for the month of February 2017:

Sl. No.	Date	Location	Ammonia (NH_3) ppm	Carbon Monoxide (CO) ppm
1	13-02-17	Fire & Safety Control Room	0.1	<1
2	13-02-17	OHC	0.1	<1
3	13-02-17	Control Room (Ammonia & Urea 1)	0.2	<1
4	13-02-17	Ammonia 1 (02 Area)	0.2	<1
5	13-02-17	Ammonia 1 (03 Area) Field Cabin	0.3	<1
6	13-02-17	Ammonia 1 (04 Area) Acoustic Room	0.4	<1
7	13-02-17	Ammonia 1 (05 Area) Field Cabin	0.1	<1
8	13-02-17	Field Cabin Amm 1 (Mech. Maint.)	0.2	<1
9	13-02-17	Field Cabin (Urea 1)	0.2	<1
10	13-02-17	Field Cabin Urea 1 (Mech. Maint.)	0.1	<1
11	14-02-17	Control Room (GT-C)	0.2	<1
12	14-02-17	Control Room (Ammonia & Urea 2)	0.2	<1
13	14-02-17	Ammonia 2 (02 Area)	0.2	<1
14	14-02-17	Ammonia 2 (03 Area) Field Cabin	0.1	<1
15	14-02-17	Ammonia 2 (04 Area) Acoustic Room	0.4	<1
16	14-02-17	Ammonia 2 (05 Area) Field Cabin	0.2	<1
17	14-02-17	Field Cabin Amm 2 (Mech. Maint.)	0.3	<1
18	14-02-17	Cooling Towers 2 Field Cabin	0.2	<1
19	14-02-17	Field Cabin (Urea 2)	0.2	<1
20	14-02-17	Field Cabin Urea 2 (Mech. Maint.)	0.2	<1
21	15-02-17	Loading Area (Bagging plant)	0.6	<1
22	15-02-17	Boilers Field Cabin	0.2	<1
23	15-02-17	Control Room (Boilers)	0.1	<1
24	15-02-17	Control Room (Ammonia Storage)	0.2	<1
25	15-02-17	Control Room (Cooling Towers 1)	0.2	<1
26	15-02-17	Security Gate	0.1	<1
27	15-02-17	Distribution Office at Security Gate	0.1	<1

Work Environment Monitoring Data for the month of March 2017:

Sl. No.	Date	Location	Ammonia (NH_3) ppm	Carbon Monoxide (CO) ppm
1	13-03-17	Fire & Safety Control Room	0.1	<1
2	13-03-17	OHC	0.1	<1
3	13-03-17	Control Room (Ammonia & Urea 1)	0.1	<1
4	13-03-17	Ammonia 1 (02 Area)	0.2	<1
5	13-03-17	Ammonia 1 (03 Area) Field Cabin	0.2	<1
6	13-03-17	Ammonia 1 (04 Area) Acoustic Room	0.6	<1
7	13-03-17	Ammonia 1 (05 Area) Field Cabin	0.4	<1
8	13-03-17	Field Cabin Amm 1 (Mech. Maint.)	0.2	<1
9	13-03-17	Field Cabin (Urea 1)	0.2	<1
10	13-03-17	Field Cabin Urea 1 (Mech. Maint.)	0.2	<1
11	14-03-17	Control Room (GT-C)	0.1	<1
12	14-03-17	Control Room (Ammonia & Urea 2)	0.2	<1
13	14-03-17	Ammonia 2 (02 Area)	0.2	<1
14	14-03-17	Ammonia 2 (03 Area) Field Cabin	0.2	<1
15	14-03-17	Ammonia 2 (04 Area) Acoustic Room	0.3	<1
16	14-03-17	Ammonia 2 (05 Area) Field Cabin	0.4	<1
17	14-03-17	Field Cabin Amm 2 (Mech. Maint.)	0.2	<1
18	14-03-17	Cooling Towers 2 Field Cabin	0.2	<1
19	15-03-17	Field Cabin (Urea 2)	0.2	<1
20	15-03-17	Field Cabin Urea 2 (Mech. Maint.)	0.1	<1
21	15-03-17	Loading Area (Bagging plant)	0.8	<1
22	15-03-17	Boilers Field Cabin	0.1	<1
23	15-03-17	Control Room (Boilers)	0.1	<1
24	15-03-17	Control Room (Ammonia Storage)	0.2	<1
25	15-03-17	Control Room (Cooling Towers 1)	0.2	<1
26	15-03-17	Security Gate	0.1	<1
27	15-03-17	Distribution Office at Security Gate	0.1	<1

Stack Monitoring Data for the month of October 2016 (Process Stacks):

Date	PLANT- I				PLANT- II	CFG PLANT
	Reformer stack F-(201+202) (Against Chimney No. 20)	**HRSG A (Chimney No. 4)**	**HRSG B (Chimney No. 5)**	**Boiler Stack (Chimney No. 3)**	**HRSG C (Chimney No. 14)**	**Stack attached to De-dusting and Scrubbing Section (Chimney No. 21)**
	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)
05.10.16	12.9	11.2	10.7	13.6	12.5	18.8
12.10.16	13.6	10.6	8.6	11.4	10.1	21.7
19.10.16	10.3	9.8	11.2	14.2	9.9	22.8
26.10.16	14.5	10.4	9.4	12.7	11.3	25.5

Stack Monitoring Data for the month of October 2016 (Prill Towers):

Plant	Date	Dust		Plant	Date	Dust	
		mg/Nm^3	Kg/MT			mg/Nm^3	Kg/MT
I (Chimney No. 6)	04.10.16	18.2	0.129	II (Chimney No. 15)	04.10.16	22.9	0.169
	11.10.16	21.5	0.152		11.10.16	17.8	0.127
	18.10.16	16.9	0.120		18.10.16	20.5	0.145
	25.10.16	23.4	0.165		25.10.16	25.7	0.182

Stack Monitoring Data for the month of November 2016 (Process Stacks):

Date	PLANT- I				PLANT- II	CFG PLANT
	Reformer stack F-(201+202) (Against Chimney No. 20)	**HRSG A (Chimney No. 4)**	**HRSG B (Chimney No. 5)**	**Boiler Stack (Chimney No. 3)**	**HRSG C (Chimney No. 14)**	**Stack attached to De-dusting and Scrubbing Section (Chimney No. 21)**
	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)
02.11.16	14.2	12.0	11.5	12.3	14.1	26.5
09.11.16	12.9	10.4	9.7	10.8	12.5	31.0
16.11.16	13.1	11.6	12.1	13.5	9.7	31.7
23.11.16	10.5	9.9	10.6	9.4	13.2	1.8
30.11.16	12.7	13.8	11.0	10.2	10.4	1.8

Stack Monitoring Data for the month of November 2016 (Prill Towers):

Plant	Date	Dust		Plant	Date	Dust	
		mg/Nm^3	Kg/MT			mg/Nm^3	Kg/MT
I (Chimney No. 6)	01.11.16	22.8	0.161	II (Chimney No. 15)	01.11.16	19.5	0.137
	08.11.16	17.1	0.123		08.11.16	23.4	0.165
	15.11.16	21.0	0.152		15.11.16	25.9	0.206
	22.11.16	23.2	0.167		22.11.16	24.3	0.173
	29.11.16	20.7	0.150		29.11.16	26.8	0.215

Stack Monitoring Data for the month of December 2016 (Process Stacks):

Date	PLANT- I				PLANT- II	CFG PLANT
	Reformer stack F-(201+202) (Against Chimney No. 20)	**HRSG A (Chimney No. 4)**	**HRSG B (Chimney No. 5)**	**Boiler Stack (Chimney No. 3)**	**HRSG C (Chimney No. 14)**	**Stack attached to De-dusting and Scrubbing Section (Chimney No. 21)**
	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)
07.12.16	7.0	10.0	10.0	12.3	14.0	2.3
14.12.16	12.0	13.0	12.0	10.8	15.0	0.1
21.12.16	10.0	14.0	13.0	13.5	13.0	7.2
28.12.16	11.0	9.0	10.0	9.4	14.0	17.9

Stack Monitoring Data for the month of December 2016 (Prill Towers):

Plant	Date	Dust		Plant	Date	Dust	
		mg/Nm^3	Kg/MT			mg/Nm^3	Kg/MT
I (Chimney No. 6)	06.12.16	24.5	0.179	II (Chimney No. 15)	06.12.16	20.1	0.144
	13.12.16	22.9	0.168		13.12.16	22.5	0.162
	20.12.16	18.9	0.141		20.12.16	23.0	0.165
	27.12.16	24.0	0.180		27.12.16	27.3	0.200

Stack Monitoring Data for the month of January 2017 (Process Stacks):

Date	PLANT- I				PLANT- II	CFG PLANT
	Reformer stack F-(201+202) (Against Chimney No. 20)	**HRSG A (Chimney No. 4)**	**HRSG B (Chimney No. 5)**	**Boiler Stack (Chimney No. 3)**	**HRSG C (Chimney No. 14)**	**Stack attached to De-dusting and Scrubbing Section (Chimney No. 21)**
	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)
04.01.17	10.0	Under S/D	Under S/D	13.0	11.0	18.2
11.01.17	8.0	10.0	Under S/D	15.0	12.0	20.3
18.01.17	11.0	13.0	11.0	9.0	14.0	2.2
25.01.17	9.0	12.0	13.0	11.0	13.0	1.5

Stack Monitoring Data for the month of January 2017 (Prill Towers):

Plant	Date	Dust		Plant	Date	Dust	
		mg/Nm^3	Kg/MT			mg/Nm^3	Kg/MT
I (Chimney No. 6)	03.01.17	16.6	0.133	II (Chimney No. 15)	03.01.17	Under S/D	Under S/D
	10.01.17	Under S/D	Under S/D		10.01.17	24.9	0.205
	17.01.17	25.4	0.188		17.01.17	18.7	0.135
	24.01.17	22.6	0.164		24.01.17	25.1	0.179

Stack Monitoring Data for the month of February 2017 (Process Stacks):

Date	PLANT- I				PLANT- II	CFG PLANT
	Reformer stack F-(201+202) (Against Chimney No. 20)	**HRSG A (Chimney No. 4)**	**HRSG B (Chimney No. 5)**	**Boiler Stack (Chimney No. 3)**	**HRSG C (Chimney No. 14)**	**Stack attached to De-dusting and Scrubbing Section (Chimney No. 21)**
	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)
01.02.17	7.0	10.0	Under S/D	11.0	9.0	1.2
08.02.17	9.0	5.0	Under S/D	14.0	11.0	2.2
15.02.17	7.0	Under S/D	12.0	10.0	10.0	2.3
22.02.17	11.0	Under S/D	15.0	7.0	10.0	1.5

Stack Monitoring Data for the month of February 2017 (Prill Towers):

Plant	Date	Dust		Plant	Date	Dust	
		mg/Nm^3	Kg/MT			mg/Nm^3	Kg/MT
I (Chimney No. 6)	07.02.17	21.9	0.158	II (Chimney No. 15)	07.02.17	22.8	0.164
	14.02.17	19.8	0.155		14.02.17	Under S/D	Under S/D
	21.02.17	23.5	0.184		21.02.17	Under S/D	Under S/D
	28.02.17	18.4	0.129		28.02.17	Under S/D	Under S/D

Stack Monitoring Data for the month of March 2017 (Process Stacks):

Date	PLANT- I				PLANT- II	CFG PLANT
	Reformer stack F-(201+202) (Against Chimney No. 20)	**HRSG A (Chimney No. 4)**	**HRSG B (Chimney No. 5)**	**Boiler Stack (Chimney No. 3)**	**HRSG C (Chimney No. 14)**	**Stack attached to De-dusting and Scrubbing Section (Chimney No. 21)**
	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)	SPM (mg/Nm^3)
01.03.17	8.0	Under S/D	11.0	11.0	9.0	2.7
08.03.17	10.0	6.0	9.0	9.0	11.0	1.4
15.03.17	9.0	9.0	12.0	12.0	10.0	5.0
22.03.17	6.0	10.0	10.0	10.0	15.0	6.8
29.03.17	11.0	7.0	9.0	13.0	12.0	11.5

Stack Monitoring Data for the month of March 2017 (Prill Towers):

Plant	Date	Dust		Plant	Date	Dust	
		mg/Nm^3	Kg/MT			mg/Nm^3	Kg/MT
I (Chimney No. 6)	07.03.17	19.9	0.139	II (Chimney No. 15)	07.03.17	23.4	0.169
	14.03.17	22.5	0.157		14.03.17	24.6	0.177
	21.03.17	21.9	0.152		21.03.17	18.5	0.133
	28.03.17	20.8	0.144		28.03.17	19.7	0.141