QUARTERLY PERFORMANCE WITH RESPECT TO ENVIRONMENTAL ASPECTS

DURING QUARTER III (OCT-DEC '22),2022-23

Name of Enterprise **: Numaligarh Refinery Limited**

I. Fresh Water in Cubic Meter Per Tonne of Crude Processed

Table A-I	OCT	NOV	DEC	Cummulative OCT-DEC'22	Cumm. for the period APRIL-MARCH'23
Crude Processed, MT	279609	246998	271758	**798365**	**2358234**
Fresh Water Consumed, M3	592682	612809	627868	**1833359**	**5359207**
Water Consumed, M3/MT of Crude Processed	2.1	2.5	2.3	2.30	2.27
(Design capacity is 2.8 M3/MT of Crude Processed)					

II. Liquid Effluent Quantity

Table A-II	OCT	NOV	DEC	Cummulative OCT-DEC'22	Cumm. for the period APRIL-MARCH'23
Quantity of Effluent Discharged/loss, M3***	**41539**	**39051**	**37712**	118302	118302
Effluent Discharged/loss, M3/1000 MT of Crude Processed	149	158	139	148	50
Reuse, M3	60978	67102	70102	**198182**	**758182**
% Reuse/Recycled on Effluent Generated	57.9	61.4	62.4	**60.6**	**87.0**

III. Average Sulphur Dioxide Emission

Table A-III	OCT	NOV	DEC	Average OCT-DEC'22	Average for the period APRIL-MARCH'23
SO2 Emission, Kg/Hr	97.5	100.4	100.4	**99.4**	**95.7**
(SPCB Norms: 256 Kg/Hr as SO2)					

Remarks ***Treated water discharge to outside environment directly from ETP via dedicated pipeline discontinued since 2006. Presently there is no dedicated facility for discharging Treated effluent from ETP. The quanitities provided are representation of the system/operational losses in ETP due to various constraints

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QUARTERLY PERFORMANCE REPORT W.R.T ENIVRONMENTAL ASPECT

DURING QR. III (OCT-DEC'22) 2022 -23

TABLE-1 LIQUID EFFLUENT POLLUTANT LEVEL -								
MONITORED VALUES in mg/lit.except pH								
SL. NO	PARAMETERS	NO. OF OBS	MAX.	MIN.	AVG.	Limiting value for conc. (mg/l except for pH)	Quantum limit in Kg / 1000 MT of crude processed	
							Actual	Standard
1	pH	90	7.5	6.5	7.1	6-8.5	-	-
2	OIL & GREASE	90	5.0	1.2	2.65	5	0.66	2.0
3	SULPHIDE	90	<0.1	<0.1	<0.1	0.5	0.02	0.2
4	PHENOL	90	0.33	0.05	0.12	0.35	0.03	0.14
5	S. SOLID	90	20.0	5.2	15.05	20.0	3.74	8.0
6	COD	90	118.0	28.00	67.5	125.0	16.76	50.0
7	BOD3	90	15.0	5.0	12.59	15.0	3.13	6.0
8	CN	90	<0.02	<0.02	<0.02	0.2	<0.02	0.08
9	Ammonia as N	3	12.2	10.8	11.60	15.0	2.88	6.0
10	Cr (Hexavalent)	3	0	0	0.00	0.1	0.00	0.04
11	Cr (Total)	3	0.004	0.001	0.003	2.0	0.001	0.8
12	Pb	3	0	0	0.0000	0.1	0.00	0.04
13	Zn	3	0.028	0.006	0.020	5.0	0.005	2.0
14	Ni	3	0.003	0.001	0.002	1.0	0.0005	0.4
15	Cu	3	0.003	0.001	0.002	1.0	0.0004	0.4
16	Benzene	3	<0.1	<0.1	<0.1	0.1	<0.1	0.04
17	Benzo (a)- Pyrene	3	<0.2	<0.2	<0.2	0.2	<0.2	0.08
18	Hg	3	<0.01	<0.01	<0.01	0.01	<0.01	0.004
19	V	3	<0.2	<0.2	<0.2	0.2	<0.2	0.8
20	TKN	3	29.1	26.45	27.9	40.0	6.93	16.0
21	P	3	1.7	1.26	1.49	3.0	0.37	1.2

Limiting concentration of effluent is as per MoEF notification on standard vide GSR-186 (E)dated 18th March, 2008.

*** BDL- Detectable Limit : 0.1 microgram/Litre**

*** Parameters from 9 to 21 are monitored once in a month as per CPCB norms**

QUARTERLY PERFORMANCE REPORT W.R.T ENVIRONMENTAL ASPECT.

DURING QUARTER III (OCT-DEC'22), 2022-23

Online Stack Analyser data

UNIT	FURNACE STACK	PARAMETER	OBSERVED VALUE in mg/Nm3			Limiting Concentration in mg/Nm3	Remarks
			MAX.	MIN.	AVG		
CDU/VDU	FF-01/02	SO2	336.46	41.36	160.03	769	Stack with dual firing (FG:FO=56:44)
		NOx	176.27	9.01	111.52	394	
		CO	7.89	4.88	6.24	172	
		PM	40.92	5.91	17.76	49	
DCU	FF-01	SO2	168.80	7.06	87.51	673	Stack with dual firing (FG:FO=62:38)
		NOx	193.81	18.68	98.85	388	
		CO	2.62	0.02	1.47	169	
		PM	15.63	4.58	7.02	44	
HCU	FF-01/02	SO2	7.56	1.42	22.10	50	Stack with Gas firing
		NOx	44.71	5.89	22.10	350	
		CO	8.89	2.14	2.63	150	
		PM	5.32	4.15	4.99	10	
HCU	FF-03	SO2	95.08	3.60	39.83	196	Stack with dual firing (FG:FO=91:9)
		NOx	79.86	4.70	30.18	359	
		CO	44.78	2.13	13.73	154	
		PM	8.13	4.84	5.82	18	
H2U	FF-01	SO2	46.70	12.50	26.75	50	Stack with Gas firing
		NOx	47.88	9.85	32.16	350	
		CO	68.87	1.95	8.53	150	
		PM	7.308	5.55	6.45	10	
CPP(HRSG)		SO2	43.40	21.95	36.39	50	Stack with Gas firing
		NOx	56.03	13.28	31.61	350	
		CO	8.58	1.37	4.82	150	
		PM	4.45	2.30	3.47	10	
CPP (UB)		SO2	32.29	16.28	22.60	50	Stack with dual firing (FG:FO=100:0)
		NOx	126.87	20.84	91.83	350	
		CO	16.13	0.10	5.07	150	
		PM	8.65	5.02	6.96	10	
		SO2	5.83	1.20	1.76	50	

MSP (CRU)	NOx	82.63	60.86	73.08	**350**	Stack with Gas firing
	CO	3.91	0.78	2.10	**150**	
	PM	7.27	5.00	6.26	**10**	
MSP (NHTU)	SO2	24.80	6.33	14.99	**50**	Stack with Gas firing
	NOx	91.79	71.00	82.99	**350**	
	CO	3.36	0.54	1.46	**150**	
	PM	7.27	5.00	6.26	**10**	
DHDT	SO2	84.24	4.57	29.39	**50**	Stack with Gas firing
	NOx	77.27	15.02	53.23	**250**	
	CO	53.24	0.73	12.11	**100**	
	PM	0.67	0.60	0.64	**5**	
Limiting concentration of emission calculated as per MOEF notification on standard vide GSR-186 (E) dated 18th March, 2008.						

NUMALIGARH REFINERY LIMITED

QUARTERLY PERFORMANCE WITH RESPECT TO ENVIRONMENTAL ASPECTS DURING QUARTER III (OCT-DEC'22), 2022-23

Ambient Air Quality Data

STATION	PARAMETER	STD NAAQS-2009	Unit	OBSERVATIONS		
				MAX	MIN	AVG
REFINERY (WATCH TOWER NO. 6)	SO2	80 (24 hr avg.)	µg/m3	13.9	9.70	11.4
	NO2	80 (24 hr avg.)	µg/m3	18.3	12.2	15.1
	O_3	100 (8 hr avg.)	µg/m3	38.0	15.4	27.2
	CO	2.000 (8 hr.avg.)	mg/m3	0.990	0.70	0.830
	NH_3	400 (24 hr.avg.)	µg/m3	31.0	16.8	24.11
	PM 10	100 (24 hr.avg.)	µg/m3	63.6	47.5	55.8
	PM 2.5	60 (24 hr.avg.)	µg/m3	33.9	18.2	25.6
	Benzene	05 (Annual)	µg/m3	3.40	1.20	2.05
	HC	-	mg/m3	1.11	0.70	0.92
	BaP	01 (Annual)	ng/m3	<0.5	<0.5	<0.5
	Pb	1.0 (24 hr.avg.)	µg/m3	0.42	0.18	0.33
	As	06 (Annual)	ng/m3	<1	<1	<1
	Ni	20 (Annual)	ng/m3	4.00	1.60	2.71
ECO-PARK IN NRL TOWNSHIP	SO2	80 (24 hr avg.)	µg/m3	12.60	9.30	11.0
	NO2	80 (24 hr avg.)	µg/m3	17.40	11.80	14.7
	O_3	100 (8 hr avg.)	µg/m3	36.2	16.50	25.5
	CO	2.000 (8 hr.avg.)	mg/m3	0.940	0.590	0.800
	NH_3	400 (24 hr.avg.)	µg/m3	31.1	16.20	22.4
	PM 10	100 (24 hr.avg.)	µg/m3	60.4	43.5	52.9
	PM 2.5	60 (24 hr.avg.)	µg/m3	32.1	18.7	23.3
	Benzene	05 (Annual)	µg/m3	3.20	1.20	2.3
	HC		mg/m3	1.10	0.64	0.9
	BaP	1.0 (Annual)	ng/m3	<0.5	<0.5	<0.5

	Pb	1.0 (24 hr.avg.)	µg/m3	0.40	0.17	0.273
	As	6.0 (Annual)	ng/m3	<1	<1	<1
	Ni	20 (Annual)	ng/m3	3.40	1.50	2.63
RAW WATER INTAKE	SO2	80 (24 hr avg.)	µg/m3	12.3	7.8	10.4
	NO2	80 (24 hr avg.)	µg/m3	17.1	10.2	13.8
	O_3	100 (8 hr avg.)	µg/m3	33.4	15.0	24.0
	CO	2.000 (8 hr.avg.)	mg/m3	0.90	0.62	0.76
	NH_3	400 (24 hr.avg.)	µg/m3	27.80	15.00	20.98
	PM 10	100 (24 hr.avg.)	µg/m3	56.4	41.7	48.9
	PM 2.5	60 (24 hr.avg.)	µg/m3	28.6	16.1	21.1
	Benzene	05 (Annual)	µg/m3	3.00	1.10	2.1
	HC		mg/m3	1.06	0.63	0.9
	BaP	01 (Annual)	ng/m3	0.00	<0.5	<0.5
	Pb	1.0 (24 hr.avg.)	µg/m3	0.380	0.17	0.29
	As	06 (Annual)	ng/m3	<1	<1	<1
	Ni	20 (Annual)	ng/m3	3.40	1.30	2.41
NH-39 BYPASS	SO2	80 (24 hr avg.)	µg/m3	15.9	10.3	13.2
	NO2	80 (24 hr avg.)	µg/m3	21.8	14.0	17.5
	O_3	100 (8 hr avg.)	µg/m3	41.3	19.2	31.4
	CO	2.000 (8 hr.avg.)	mg/m3	1.150	0.800	0.953
	NH_3	400 (24 hr.avg.)	µg/m3	36.7	19.0	28.6
	PM 10	100 (24 hr.avg.)	µg/m3	73.7	52.1	65.0
	PM 2.5	60 (24 hr.avg.)	µg/m3	39.1	20.4	29.0
	Benzene	05 (Annual)	µg/m3	4.00	1.40	2.20
	HC	-	mg/m3	1.34	0.77	1.10
	BaP	1	ng/m3	<0.5	<0.5	<0.5
	Pb	1.0 (24 hr.avg.)	µg/m3	0.48	0.19	0.340

	As	6	ng/m3	1.00	1.00	1.00
	Ni	20 (Annual)	ng/m3	4.60	1.60	3.13
KAZIRANGA WILDLIFE SANCTUARY AT AGARTOLI	SO2	80 (24 hr avg.)	µg/m3	11.70	7.90	9.95
	NO2	80 (24 hr avg.)	µg/m3	16.0	10.8	13.2
	O_3	100 (8 hr avg.)	µg/m3	29.9	14.50	21.2
	CO	2.000 (8 hr.avg.)	mg/m3	0.860	0.580	0.7
	NH_3	400 (24 hr.avg.)	µg/m3	28.70	14.40	21.2
	PM 10	100 (24 hr.avg.)	µg/m3	54.3	39.1	45.7
	PM 2.5	60 (24 hr.avg.)	µg/m3	27.3	14.8	21.0
	Benzene	05 (Annual)	µg/m3	2.70	0.90	1.9
	HC	-	mg/m3	1.01	0.63	0.8
	BaP	1.0	ng/m3	<0.5	<0.5	<0.5
	Pb	1.0 (24 hr.avg.)	µg/m3	0.37	0.16	0.26
	As	6.0	ng/m3	1.00	1.00	1.00
	Ni	20 (Annual)	ng/m3	3.20	1.20	2.41

BDL:Below Detection Level, All the parameters are found to be within limt