ENVIRONMENTAL STATEMENT

(FORM-V)

For the year ending 31st March'2019

SOLAR INDUSTRIES INDIA LIMITED

Village- Chakdoh (Bazargaon)

Tahsil- Katol

Dist. Nagpur- 440-023
(M.S.)

ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st MARCH 2019

(FORM-V)
(see rule 14)

PART - A

1. Name and Address of the ~~owner~~/ occupier of the industry Operation or process. : Shri. A. K. Jain,
M/s Solar Industries India Limited
Village: Chakdoh (Bazargaon)
District: Nagpur 440 023 (M. S.)

2. Industry Category : Explosive

   Primary: - (STC Code) : —

   Secondary: - (STC Code) : —

3. Production Capacity :

S. No.	Name of Products	Production Capacity Per Annum
1.	Slurry/Emulsion Explosives	100000.000 MT
2.	Detonators (Finished)	125.000 Million Nos.
3.	PETN (Intermediate & Finished)	2062.500 MT
4.	HMX & HMX compounded Products	62.500 MT
5.	Detonating Fuse (Finished)	93.750 Million Meters
6.	Pentolite/ Cast Booster (Finished)	1875.000 MT
7.	Sorbitan Mono Oleate –SMO (I & F)	9155.000 MT
8.	Calcium/Sodium Nitrate Melt (Captive)	3600.000 MT
9.	Dust Suppressant (Finished)	1000.000 MT
10.	Poly iso butylene succinic anhydride (PIBSA) (Captive & Finished)	6000.000 MT
11.	Filling & Pressing of filled shells (Captive)	62.500 Million Nos.
12.	Lead azide (Captive)	9.000 MT
13.	Lead styphnate (Captive)	3.000 MT
14.	ASA Mixing & Drying (Captive)	12.000 MT
15.	GI/CU Wire Coating	90.000 Million Nos.

4. Year of Establishment : May 1996

5. Date of the last Environmental Statement submitted : 21-09-2018

PART- B

WATER AND RAW MATERIAL CONSUMPTION

i) Water Consumption (Avg.) :

S. No.	Activity	Consented Consumption M^3/day	Previous Year 2017-18 M^3/day	Current Year 2018-19 M^3/day
1.	Process	112.0	106.732	110.874
2.	Industrial Cooling/ Humidification Spraying/Boiler	78.0	77.692	78.591
3.	Domestic & Green Belt	115.0	112.505	114.763
	Total	**305.0**	**296.930**	**304.228**

ii) Water Consumption for process & Cooling: (M^3/ MT of Product)

S. No.	Name of products	During the previous Financial year 2017-18	During the current Financial year 2018-19
1	Slurry/Emulsion Explosives	0.35 KL/ unit	0.167 KL/unit
2	Detonators (Humidification/Cooling)	18.50 KL/ unit	17.12 KL/unit
3	Detonating Fuse (Humidification/Cooling)	2.90 KL/ unit	2.67 KL/unit
4	Pentolite Cast Booster	1.60 KL/ unit	1.18 KL/unit
5	PETN & PETN Drying	6.80 KL/ unit	5.73 KL/unit
6	HMX & HMX Compounded Products	2.730 KL/ unit	3.610 KL/unit
7	Sorbitan Mono Oleate	0.390 KL/ unit	0.587 KL/unit
8	Calcium/Sodium Nitrate Melt	0.260 KL/ unit	0.267 KL/unit
9	Poly iso butylene succinic anhydride	0.108 KL/ unit	0.118 KL/unit
10	Lead Azide/ Lead Styphnate/ASA Drying	0.310 KL/ unit	0.338 KL/unit
11	Filling & Pressing of Filled shells	0.850 KL/ unit	0.902 KL/unit
12	GI/Copper Wire Coating	0.220 KL/ unit	0.213 KL/unit

iii) **Raw Material Consumption**

	Name of Raw Materials	Consumption of raw material per unit output	
		During the Previous Financial year 2017-2018	**During the Current Financial year 2018-19**
1.	**For Slurry/Emulsion Explosive:**	**MT/Unit of output**	**MT/Unit of output**
	i) Ammonium Nitrate & Sodium Nitrates	0.670 MT	0.687 MT
	ii) Sodium Nitrite	0.0005 MT	0.0005 MT
	iii) Sodium Per chlorate	0.0004 MT	0.0002 MT
	iv) Sodium Chloride	0.171 MT	0.171 MT
	v) Aluminum Powder	0.011 MT	0.012 MT
	vi) Guar Gum	0.002 MT	0.001 MT
	vii) Emulsifiers	0.025 MT	0.008 MT
	viii) Waxes	0.040 MT	0.013 MT
	ix) Oils	0.018 MT	0.013 MT
	ix) Sulphur	0.102 MT	0.094 MT
2.	**For Detonators:**		
	i) Filled Shells	1.00 No./Unit	1.00 No./Unit
	ii) Fuse head	1.00 No./Unit	1.00 No./Unit
	iii) GI/Cu Wire Set	1.00 No./Unit	1.00 No./Unit
	iv) NONEL Shock Tube	1.00 No./Unit	1.00 No./Unit
3.	**For PETN:**		
	i) Penta Erythritol (PE)	0.439 MT	0.441 MT
	ii) Nitric Acid (98%)	2.630 MT	2.604 MT
	iii) Acetone	0.074 MT	0.084 MT
4.	**For HMX:**		
	i) Hexamine	0.831 MT	0.819 MT
	ii) Nitric Acid (98%)	2.360 MT	2.347 MT
	iii) AN Pills	2.060 MT	2.048 MT

	iv) Acetic Acid	6.772 MT	6.941 MT
	v) Acetic Anhydride	7.151 MT	7.625 MT
	vi) Solvent	0.667 MT	0.683 MT
5.	**For Detonating Fuse:**		
	i) PETN	9.800 MT	10.108 MT
	ii) PVC Granules	9.370 MT	8.985 MT
	iii) BOPP	0.468 MT	0.413 MT
	iv) Fibrillated PP Yarn	2.584 MT	2.681 MT
	v) Mercerized Thread	0.273 MT	0.287 MT
6.	**For Pentolite/Cast Booster:**		
	i) Tri nitro Toluene	0.400 MT	0.405 MT
	ii) PETN	0.600 MT	0.595 MT
7.	**For Sorbian Mono Oleate:**		
	i) Oleic Acid	0.004 MT	NA
	ii) Fatty Acid	0.750 MT	0.751 MT
	iii) Sorbitol Syrup (70 %)	0.532 MT	0.539 MT
	iv) Additives/Buffers	0.007 MT	0.004 MT
8.	**PIBSA**		
	i) Poly iso butylene	0.930 MT	0.951 MT
	ii) Maleic Anhydride	0.110 MT	0.114 MT
	iii) Additives/Buffers	NA	0.002 MT
9.	**Sodium Nitrate Melt:**		
	i) Weak Nitric Acid	1.520 MT	1.110 MT
	ii) Sodium Carbonate	0.649 MT	0.626 MT
	iii) Soda Ash	NA	0.001 MT
10.	**Calcium Nitrate Melt:**		
	i) Weak Nitric Acid	1.840 MT	1.920 MT
	ii) Limestone	NA	0.674 MT

11.	**Filling & Pressing for filled shells**		
	i) APA	NA	0.159 MT/Mill.No.
	ii) ASA	0.149 MT/Mill.No.	NA
	iii) PETN	0.416 MT/Mill.Nos.	0.420 MT/Mill.No.
	iv) Metallic shells	1.0 No./Unit	1.0 No./Unit
12.	**Lead Azide**		
	i) Sodium azide	0.500 MT	0.496 MT
	ii) Lead Nitrate	1.415 MT	1.402 MT
	iii) Dextrine	0.130 MT	0.130 MT
13.	**Lead Styphnate**		
	i) Styphnic Acid	0.630 MT	NA
	ii) Magnesium Oxide	0.100 MT	NA
	iii) Lead Nitrate	0.870 MT	NA
	iv) IPA	8.070 MT	NA
14.	**GI/Cu Wire Coating**		
	i) PVC	0.372 MT	0.527 MT
	ii) GI/CU Wire	0.583 MT	0.729 MT

Unit of Output: 1.0 MT of Slurry/Emulsion Explosives
1.0 Million Nos. of Detonators
1.0 MT of PETN
1.0 MT of HMX
1.0 Million Mts. of Detonating Fuse
1.0 MT of Pentolite Booster
1.0 MT of Sorbitan Mono Oleate (SMO)
1.0 MT of PIBSA
1.0 MT of Sodium Nitrate Melt
1.0 MT of Calcium Nitrate Melt
1.0 Million Nos. of Filling & pressing of shells
1.0 MT of Lead Azide
1.0 MT of Lead Styphnate
1.0 Million Nos. of GI/CU Wire Coating

Working days in the year:	**2017-18**	**2018-19**
	303 Days	304 Days

Details of Water Consumption

Purpose	During the Previous Financial Year 2017-2018	During the Current Financial Year 2018-2019
1. Process	32340 KL	33706 KL
2. Boiler & Cooling	23540 KL	23891 KL
3. Domestic & Green Belt	34102 KL	34888 KL

I. Production Details

Name of Product		During the Previous Financial Year 2017-2018	During the Current Financial Year 2018-2019
1.	Slurry/Emulsion Explosives (Finished)	98386.154 MT	98372.25 MT
2.	Detonators (Finished)	76.147 Million Nos	94.613 Million Nos.
3.	Filling & Pressing of filled shells (Captive)	61.800 Million Nos.	60.015 Million Nos.
4.	PETN (Captive & Finished)	1567.800 MT	2021.8 MT
5.	HMX & HMX Compounded Product (Captive & Finished)	60.471 MT	59.017 MT
6.	Detonating Fuse (Finished)	96.646 Million Mts.	92.21 Million Mts.
7.	Pentolite Cast Booster (Finished)	1313.462 MT	1719.045 MT
8.	Sorbitan Mono Oleate (SMO) (Captive & Finished)	2428.800 MT	2438.700 MT
9.	Sodium Nitrate Melt	3262.469 MT	3555.382 MT
10.	Poly iso Butylene Succinic Anhydride (PIBSA) (Captive & Finished)	718.993 MT	739.017 MT
11.	Lead Azide (Wet Basis) (Captive)	7.780 MT	8.400 MT
12.	Lead Styphnate (Wet Basis) (Captive)	1.550 MT	NIL
13.	ASA/APA Mixing & Drying (Captive)	9.330 MT	10.926 MT
14.	GI/Cu wire Coating (Captive) (Captive)	67.820 Million Nos.	86.100 Million Nos.
15.	Dust Suppressant (Finished)	NIL	NIL

II. Details of Raw Material Consumption

Name of Raw Materials	Consumption of Raw Material	
	During the Previous Financial Year 2017-2018	During the Current Financial Year 2018-2019
1. Slurry/Emulsion Explosive:		
i) Ammonium Nitrate	65918.720 MT	108658.992 MT
ii) Sodium Nitrate	2800.100 MT	4194.347 MT
iii) Sodium Nitrite	49.190 MT	73.601 MT
iv) Aluminum Powder	828.487 MT	1888.606 MT
v) Guar Gum	150.690 MT	125.965 MT
vi) Sulphur	7678.460 MT	9251.450 MT
vii) Sodium Per chlorate	39.350 MT	11.050 MT
viii) Sodium Chloride	324.900 MT	159.812 MT
ix) Emulsifiers	1327.67 MT	1335.333 MT
x) Oils	954.00 MT	2132.724 MT
xi) Waxes	2120.040 MT	2005.070 MT
2. Detonators:		
i) Filled Shells	76.147 Million Nos.	94.610 Million Nos.
ii) Fuse Head	76.147 Million Nos.	94.352 Million Nos.
iii) GI/Cu Wire Set	67.82 Million Nos.	94.352 Million Nos.
iv) Nonel Shock Tube	75.550 Million Nos.	26.262 Million Nos.
3. PETN :		
i) Penta Erythritol (PE)	608.263 MT	1175.920 MT
ii) Nitric Acid (CNA 98%)	4076.300 MT	6944.167 MT
iii) Acetone	116.170 MT	224.737 MT

4. HMX:

i) Hexamine	50.251 MT	48.369 MT
ii) Nitric Acid (98%)	142.710 MT	138.634 MT
iii) Ammonium Nitrate Pills	124.57 MT	121.001 MT
iv) Acetic Acid	819.000 MT	410.029 MT
v) Acetic Anhydride	864.850 MT	450.417 MT
vi) Solvent	80.668 MT	40.369 MT

5. Detonating Fuse:

i) PETN	947.130 MT	14478.671 MT
ii) PVC Granules	905.573 MT	1286.935 MT
iii) BOPP	45.230 MT	59.198 MT
iv) Fibrillated PP Yarn	245.500 MT	383.993 MT
v) Cotton Thread (Mercerized)	26.400 MT	41.058 MT

6. Pentolite Booster:

i) Trinitro Toluene	419.3268 MT	540.129 MT
ii) PETN	692.158 MT	762.670 MT

Sorbian Mono Oleate:

i) Oleic Acid	1.140 MT	NA
ii) Fatty Acid	1822.047 MT	1832.058 MT
iii) Sorbitol Syrup (70 %)	1293.573 MT	1313.992 MT
iv) Additives/Buffers	1.769 MT	8.894 MT

7. PIBSA :

i) Poly iso butylene	668.881 MT	703.15 MT
ii) Maleic Anhydride	80.760 MT	84.45 MT
iii) Additives/Buffers	NA	1.242 MT

8. Sodium Nitrate Melt:

i) Weak Nitric Acid	4947.120 MT	45558.788 MT
ii) Sodium Carbonate	2117.480 MT	2570.993 MT
iii) Soda Ash	NA	5.339 MT

9. Calcium Nitrate Melt:

i) Weak Nitric Acid	4947.120 MT	7402.335 MT
ii) Limestone powder	NA	2598.523 MT

10. PIBSA :

i) Poly iso butylene	668.881 MT	703.15 MT
ii) Maleic Anhydride	80.760 MT	84.45 MT

11. Filling & Pressing for filled shells:

i) PETN	26.365 MT	28.566 MT
ii) ASA	9.440 MT	NA
iii) APA	NA	10.794 MT
Iv) Metallic shells	63.000 Million Nos.	60.015 Million Nos.

12. Lead Azide :

i) Sodium azide	3.870 MT	4.674 MT
ii) Lead Nitrate	11.010 MT	13.227 MT
iii) Dextrine	1.030 MT	1.222 MT

13. Lead Styphnate: *

i) Styphnic Acid	0.970 MT	NA *
ii) Magnesium Oxide	0.160 MT	NA*
iii) Lead Nitrate	1.350 MT	NA*
iv) IPA	12.510 MT	NA*

* There has no production of Lead Styphanate during the FY.

PART – C

Pollution Discharged to Environment / Unit of Output

Pollutants	Quantity of of Pollutants Discharged (Mass/Day)	Concentration of Pollutants in Discharges (Mass/Volume)	Percentage of Variation from Prescribed Standards with reason

Waste Water:

	Treated Effluent	**(Kg/day)**	**(Mg/liter)**	**Prescribed**
1.	pH	-	7.63	Within limit
2.	Total Suspended Solids	0.123	11.36	—" —
3.	B.O.D. 27^{O}C 3 days	0.066	6.10	—"—
4.	Chemical Oxygen Demand	1.744	160.04	—"—
5.	Oil & Grease	0.002	0.20	—"—
6.	Chlorides	0.460	42.248	—"—
7.	Sulphate	0.209	19.942	—"—
8.	Total Dissolved Solids	9.711	891.00	—"—
9.	Lead (as Pb)	0.0002	0.024	—"—

Note: ZLD of Treated wastewater has been achieved.

Air Emissions:

I. Stack Emissions (Avg.)

1) **Stack – 1 (Thermic Fluid Heater)**

i) Total Particulate Matter (mg/Nm^3) : 112.18
ii) Sulphur Oxides as SO_2 (mg/Nm^3) : 91.25
iii) Sulphur Oxides as SO_2 (kg/hr) : 0.58
iv) Oxides of Nitrogen as NO_2 (mg/Nm^3) : 48.00

2) **Stack – 2 & 3 (attached to APC system at Coal Fired Boiler 2 & 3T/Hr.)**

i) Total Particulate Matter (mg/Nm^3) : SHUT
ii) Sulphur Oxides as SO_2 (mg/Nm^3) : -
iii) Sulphur Oxides as SO_2 (kg/hr) : -
iv) Oxides of Nitrogen as NO_2 (mg/Nm^3) : -

3) **Stack – 4 (attached to APC system at Coal Fired Boiler 6 T/Hr.)**

i) Total Particulate Matter (mg/Nm^3)	:	78.30
ii) Sulphur Oxides as SO_2 (mg/Nm^3)	:	81.50
iii) Sulphur Oxides as SO_2 (kg/hr)	:	1.20
iv) Oxides of Nitrogen as NO_2 (mg/Nm^3)	:	48.20

4) **Vent – 1 (attached to APC Scrubber system at PETN Plant)**
Oxides of Nitrogen as NO_2 (PPM) : 25.58

5) **Vent – 2 (attached to APC Scrubber system at SN Plant)**
Oxides of Nitrogen as NO_2 (PPM) : 28.98

6) **DG Set Emission**		**500 KVA**	**600 KVA**
i) Total Particulate Matter (mg/Nm^3)	:	74.4	61.6
ii) Sulphur Oxides as SO_2 (mg/Nm^3)	:	153.95	136.9
iii) Sulphur Oxides as SO_2 (kg/hr)	:	0.18	0.11
iv) Oxides of Nitrogen as NO_2 (mg/Nm^3)	:	NA	NA

II. Ambient Air Quality

1) Location (SW) – Near Security Main Gate

i. Particulate Matter (PM-10) (mg/Nm^3)	:	59.02
ii. Particulate Matter (PM-2.5) (mg/Nm^3)	:	30.48
iii. Sulphur Oxide as SO_2 (mg/Nm^3)	:	7.33
iv. Oxides of Nitrogen as NO_2 (mg/Nm^3)	:	21.42

2) Location (NE) – Near Workers Colony

i. Particulate Matter (PM-10) (mg/Nm^3)	:	58.60
ii. Particulate Matter (PM-2.5) (mg/Nm^3)	:	29.76
iii. Sulphur Oxide as SO_2 (mg/Nm^3)	:	8.44
iv. Oxides of Nitrogen as NO_2 (mg/Nm^3)	:	20.82

3) Location (NW) – Magazine Area

i. Particulate Matter (PM-10) (mg/Nm^3)	:	60.02
ii. Particulate Matter (PM-2.5) (mg/Nm^3)	:	30.38
iii. Sulphur Oxide as SO_2 (mg/Nm^3)	:	8.28
iv. Oxides of Nitrogen as NO_2 (mg/Nm^3)	:	20.18

III. Ambient Noise

Location (AAQ)	**Noise Leq. dB(A) During Day Time**	**During Night Time**
i. Near Security Main Gate (SW)	52.64	40.50
ii Near Workers Colony (NE)	56.36	49.42
iii Near Magazine Area (NW)	58.8	50.52

Location (Work Place)		Noise Level in dB(A)
I.	Near D. G.	77.1
II.	Near Main Gate	68.7
III.	Near Canteen	64.8
IV.	PETN Drying Plant	80.9
V.	Emulsion Plants	72.3
VI.	Slurry Plants	78.5

PART –D

HAZARDOUS WASTES

(As specified under Hazardous Wastes/Management and Handling Rules, 1989, amended 2016)

Hazardous Wastes		Total Quantity	
		During the Previous Financial Year 2017-2018	During the Current Financial Year 2018-2019
A)	**From Process** Ash from Explosives contaminated waste Burning [Containers/Liners/Plastic Bags, Cardboard Boxes, Spillage, Damaged Cartridges etc.] (Category No. 33.1 & 37.2)	8.540 MT	29.99 MT
B)	**From Pollution Control Facilities**		
	Chemical Sludge of ETP (Category No. 35.3)	20.000 MT	21.62 MT
C)	**Used or Spent Oil** (Category No.5.1)	Nil	Nil

PART – E

SOLID WASTES

		Total Quantity (Tones)	
		During the Previous Financial Year 2017-18	During the Current Financial Year 2018-19
A.	**From Process**	Nil	Nil
B.	**From Pollution Control Facilities (Biological sludge)**	2.230	2.650

C.	**Quantity recycled/ Re-utilized within the unit**		
	(a) Biofuel (Agro Waste Briquette) Ash	181.70 MT	174.24 MT
	(b) Boiler (Coal) Ash **(Sold to Brick manufacturer)**	1079.50 MT	1451.00 MT
D.	**E- Waste (Sold to Recycler)**	446.500 Kg	1110 Kg

PART – F

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

Solid and Hazardous wastes generated by the factory are boiler ash, chemical sludge and ash from burning of sweeping wastes of the plants, damaged cartridges discarded liners/plastic bags, cardboard boxes, etc. The details of solid and hazardous wastes and their disposal practices are as discussed below:

1.0 Solid Waste (Non- Hazardous)

1.1 Boiler Ash

Boiler coal ash generated from boiler is removed from bag filters. The boiler ash collected and sold to the brick manufacturers. The biofuels ash of boiler (briquettes feeding) is utilized for leveling of the low-lying areas within the factory premises.

1.2 Biological Sludge from STP (Non- Hazardous)

The sludge collected on the sludge drying bed is sun dried. This is utilized as manure in the plantation and gardening for green belt development within the factory premises.

2.0 Hazardous Waste

2.1 Chemical Sludge from Effluent Treatment Plant: (Category No. 35.3)

ETP sludge is separated at the sludge drying beds of ETP. Sun dried sludge is collected and stored in LDPE lined bags and disposed to CHWTSDF, Butibori of M/s Maharashtra Enviro Power Limited, Nagpur.

2.2 Ash from destruction of contaminated discarded containers/ barrel/ liners/ cardboard boxes, explosives wastes etc. (Category No. 33.1 & 37.2)

Empty HDPE bags are collected and temporarily stored in the covered shed. The empty bags, liners, cardboard boxes, discarded containers and barrels have traces of explosives contamination. Hence, all these materials are safely burnt under the supervision of competent person at place approved by licensing authority in the licensed premises of the factory in compliance of Rule 42 of Explosives Rules, 2008. Ash is packed in the LDPE lined bags, stored in the factory premises and disposed periodically to CHWTSDF, Butibori, of M/s Maharashtra Enviro Power Limited, Nagpur.

2.3 E Waste (Management Rules, 2016)

E- waste is being stored in the stores and disposal is done to the MPCB authorized recyclers (M/s Suritex Privet Limited ,Butibori).

PART – G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production

---

In view of compliance of company policy nearly all preventive and abatement measures related to pollution control have been adopted at the factory.
The details of pollution abatement measures taken and impact on conservation of natural resources are discussed below:

1.0 Water & Wastewater Management:

The water and wastewater management describe as below:
Industrial water requirement of the factory is fulfilled by bore wells located within the factory. CGWA permission have been obtained. Rainwater harvesting pond has been developed within the factory premises and water is used for industrial activities. Water purification units and water coolers are provided for drinking water in respective process buildings.

In all the process plants effluent collection tanks have been provided to collect and recycle the effluent within the plant. The DM water regeneration and RO reject water is recycled fully in the plants.

The effluent treatment plants in the factory premises as follows:

1.1 ETP for Emulsion/Slurry, PETN, Cast Booster effluents:

In the manufacture process of slurry/emulsion explosives, periodic floor washings are necessary. This gives rise to effluent generation from the process buildings. Effluents from emulsion/ slurry plants along with other effluents are collected in the collections cum equalization tank.

1.1.1 Slurry plant effluents:
Effluent is pumped to central collection tank, from where it is pumped to aeration tank and then to flash mixer where flocculating solutions are added to the effluent. Subsequently, effluent is admitted to flocculation tank. Thereafter, effluent flows to sand filter by gravity. Sludge from the bottom of the settling tank is taken on sludge drying beds for solar drying. Filtrate of the sludge drying beds is taken to the collection/equalization tank. Treated effluent allowed pumping for land application.

1.1.2 Emulsion plant effluent:

The streams of ammonium nitrate rich effluent is collected in the respective process buildings. This is further taken to ETP through concealed pipes and processed in the vacuum distillation unit for recovery of distillated water. Condensate water is recycled in the boiler. Residual containing mainly ammonium nitrate is used in the process.

1.1.3 PETN Plant effluent:

The PETN plant effluent is collected in the effluent collection tank. The effluent is neutralized by mixing soda ash solution and send to the main ETP via counseled PVC pipeline. This is then passed through tube settler and sand filter before for sending to UF and RO. Ro reject water is further concentrated in the vacuum distillation units and concentrate utilized as raw material.

1.1.4 PETN Drying & Cast Booster plants effluent:

PETN drying plants and Cast booster plants generating effluents due to wetting of the floor for maintaining humidity. This water is collected in the ETP through counseled network of the drains.

The entire effluents collected in the central collection tank. From where it is transferred to aeration tank and supernatant sending to mixer cum settler where in pH is adjusted by addition of MOL/Alum. Effluent is treated by addition of coagulant and flocculent chemicals followed by sludge separation and allowed to settle. The settled water from the settler overflows by gravity to the sand filter and collected in treated water tank.
The sludge collected from gravity sand filters and sludge drying beds packed in the LDPE lined bags and send to CHWTSDF (MEPL) Butibori.

1.1.5 COB and Bulk Plant effluent:

The effluents from AN melt storage area, Centralized Oxidizer Blend (COB) and Bulk plant are mainly condensate water and floor washing contaminated with ammonium nitrates. The condensate water is collected in collection tank and sending to boiler. Other wastewater is collected separately in a SS tank and recycled for dissolution of solid AN as well as concentrated in vacuum distillation unit.

1.2 ETP for Chemicals plant LA/LS/ASA:

The effluent arises from the lead azide, lead styphnate and ASA drying mainly during washings of the material and floor in the respective process. These effluents contaminated with residual explosives and destruction by addition of specified chemicals under the supervision of competent persons. Then effluent allowed draining via counseled pipeline to the respective collection tanks of the ETP. The effluents are treated following the neutralization, settling and RO treatment. The RO treated water is recycled in the process and reject water distillated in the multi effect evaporation system. Distillate water is recovered and sent to the boilers.

1.3 ETP for SMO, PIBSA & CFB plant:

In the manufacture process of SMO, PIBSA the reactors required to wash at an interval to remove the charring. This effluent is collected in the oil removals cum collections tank. Then effluent is pumped to flash mixer where flocculating solutions are added to the effluent. Subsequently, effluent flows to sand filter by gravity. Sludge from the bottom of the settling tank is taken on sludge drying beds for solar drying. Filtrate of the sludge drying beds is taken to the collection/ aeration tank. Treated effluent allowed pumping to the STP for further treatment i.e. aeration, clarification, UF and RO treatment. The treated water is used for plantation.

1.4 HMX plant effluent:

The effluent from HMX plant is neutralized in the reactor by lime powder and settled. This neutralized wastewater is recycled within the process of bulk emulsion manufacturing. The settled sludge packed in the LDPE lined bags and send to CHWTSDF (MEPL) Butibori.

1.5 Sewage Treatment Plant:

Industry has installed STP based on Membrane Bio Reactor (MBR) for treatment of plant and colony wastewater. The average water generation of STP is 70.00 KLD. The wastewater collected from the plant and colony via counseled pipelines to the STP collection tank and treated water is used for plantation purposes.

2.0 Air Pollution Control Measures:

The modern set ups including scrubbers, de-dusting and bag filters for combating fugitive emissions and particulate matter have been installed in the respective processes. Existing fuel burning air pollution sources are:

i) Boilers	:	3 No. (6 TPH; Standby 2.0 TPH & 3.0 TPH)
ii) Thermo pack	:	1 Nos. (1+1S)
iii) D.G. sets	:	4 Nos. (2 x 380 KVA & 1 x 400, 1 x 600 KVA)
iv) APC PETN	:	3 Nos.
v) APC HMX	:	1 No.
vi) APC SN /ZN/CN	:	3 No.

2.1 Boiler:

There is coal/briquette fired boiler of 6 TPH. Other boilers of 2 TPH and 3 TPH are standby. The changeover of boiler fuel from coal to biomass has greatly help in reducing the air pollution. Bag filters (AJC-120-360 THERMAX make) have been installed in all the boilers. Coal dust is collected at the bottom of bag filter hopper and sold to the brick manufacturers.

The flue gases after bag filters are discharged to atmosphere through Chimney of height 30 meter. The emissions of the boilers are monitored periodically.

2.2 Thermic Fluid Heater:

The thermic fluid is heated through tubular coils. Briquette (agro waste product) is used as fuel in thermo pack heaters. To discharge the emissions a chimney of height 30 m is has been installed. The mechanical dust collector has been installed as APC facility. The emissions of the boilers are monitored periodically.

2.3 D. G. Sets (380 KVA, 400 KVA, 500 KVA & 600 KVA):

The D.G. sets 2 x 380 KVA and 1x 400 KVA 1 x 500 KVA & 1 x 600 KVA are provided for emergency operation of manufacturing process to avoid any accidental situation during MSEB power failure. These DG sets are confirming the requirements of emissions standards of E.P. Act.

2.4 Detonator Plant:

Manufacturing process of Detonator is a simple crimping which does not generate any air pollution.

2.5 Slurry/Emulsion Explosive Plants:

Manufacturing process of slurry/emulsion explosive involves mixing of raw materials. Oxidizer blend is prepared in closed preparation tanks by dissolving Ammonium Nitrate, Sodium Nitrate. Fuel blend is prepared by melting waxes in the melting tanks. Both oxidizer blend and fuel blend are mixed in jet mixer. The emission of vapours is vented to the atmosphere.

2.6 PETN & PETN Drying:

In the manufacturing of PETN, nitric acid fumes liberate during fume off process. To mitigate the air pollution due to these fumes, APC System has been provided.
In the air pollution control system fumes from the nitric acid measuring vessel, acid filter vessel and fume-off tank are sucked by means of suction blower through a common ducting and these fumes are treated in the wet scrubber.
There are two scrubbers in series and having packed column bed of rushing rings with water spray arrangement from the top of the vessel. The fumes from the common ducting enter through the bottom of the scrubber due to suction created by blower. As the acid fumes enter in scrubber and get rise through the packed column bed ammonia solution is sprayed on them through shower arrangement.

The neutralized and cleaned fumes are emitted to the atmosphere through a stack of height 11.0 m from ground level by means of a suction blower.

PETN drying process does not contribute any air pollution.

2.7 Detonating Fuses:

Manufacturing of Detonating Fuses does not contribute any air pollution except minor PVC fumes during coating of cord, where suitable exhaust system has been installed.

2.8 Cast Booster:

Manufacturing of cast booster requires melting of TNT. Wet scrubber system packed with activated carbon has been provided. The fumes are emitted to the atmosphere through a stack of height 11.0 m from ground level by means of a suction blower.

2.9 Sorbitan Mono Oleate (SMO):

The vapors emitting during reaction is collected in the glass condenser. There is no air emission from the plant.

2.10 PIBSA Plant:

The PIBSA reactors are covered from the top and water vapour is passed though condensers. The condensed water vapour is discharged to ETP. There is no air emission from the plant.

2.11 Solar Pride -Dust surfactant Plant:

Manufacturing of dust surfactant does not contribute any air pollution. There was no production of dust surfactant (Solar Pride) during the year 2018-19.

2.12 Sodium Nitrate / Calcium Nitrate / Zinc Nitrate:

In the manufacturing process nitrous fumes are liberated in very low quantity from the reactor. To mitigate the air pollution due to these fumes, APC System is provided.

In the air pollution control system, fumes are sucked through a stainless-steel ducting by means of suction blower and these fumes are treated in air pollution control arrangement comprising of two nos. scrubbers.

Ammonia gas is purged in the scrubbers having packed column bed of rushing rings in the vessel. The fumes through the common ducting enter from the bottom of the scrubber due to suction created by blower. As the acid fumes enter in scrubber and get ascend through the packed column bed, dilute caustic solution is sprayed on the fumes through shower arrangement. The neutralized and cleaned fumes are emitted to the atmosphere through a stack of height 16.0 m from ground level by means of a suction blower.

2.13 Sodium Nitrate Drying:

The concentration of sodium nitrate melt is done by centrifuge. The water outlet from the centrifuge is collected and recycled within the process of oxidizer blend of emulsion plant.

2.14 LA/LS/ASA:

There are no air emissions from the lead azide, lead styphnate and ASA drying plants.

2.15 HMX:

There has scrubbing system for neutralization of acetic acid and conc. Nitric acid vapours during process.

3.0 Water Harvesting:

The industry is located in the valley surrounded by hills from three sides. There is rainwater harvesting ponds of 262323 square meter at different locations to collect rainwater which percolates down and greatly helping in recharging the ground water reservoirs in the factory area. There is a proposal for 5 Nos. anicuts on nallah (stop water bund) at compartment No. 31 in the factory premises in 78287 square meter area which will be enough for water storage of 28571 cubic meter.

4.0 Green Belt/ Afforestation Details

There is consciousness about preserving the ecology and pristine surroundings of the factory premises. The manufacturing of explosives requires large track of land for maintaining safety zones. The land gradients and flora-fauna in the factory land area have been preserved. Moreover, apart from maintaining original flora-fauna, additional massive tree plantation has been done in the land adjoining to the plant and storage areas.

Green belt is considered as one of the major aspects in maintaining the stability of the environment of the area. It is observed that green belt exists in and around the factory site and the perennial type of cropping pattern exists in the area.
Plantation of 15000 nos. saplings has been done during monsoon season of the year, 2018 within the factory premises.

The major varieties are Casia, Casurina, Teak, Palas, Gulmohar, Subabul, Karanj, Neem, Jangali Suru, Amaltas, Shisam, etc. Also, about 2000 horticultural plants like Orange, Mosambi, Sitafal, Peru and other mixed fruit trees are developed. Lawns and gardens are maintained within the factory premises.

Apart from planting ornamental plants, social forestry is also undertaken.
During the year under Forest Conservation Act, 1980, around 87.97 Hector forest land at Chandrapur undertaken for afforestation and total Rs.14 Crore deposited to D.F.O. Chandrapur, towards maintaining afforestation, chain link fencing and creating alternate habitat for the avifauna whose nesting trees.

PART - H

Additional measures/investment proposal for environmental protection including abatement of pollution, prevention of pollution

- A multi effect evaporation system installed at upcoming TNT manufacturing plant which will take care of wastewater treatment.
- An ETP has been installed at HMX / HMX Compound and RDX/ RDX Compound manufacturing plants. The treated Water will be fully recycled within the factory as input of process material.
- Use of Freon based chillers has been discontinued and substituted by supply of cooling towers water to the cooling bath for in the continuous emulsion plants. This will make possible to save environment from ODS.

- Up gradation of PETN plant APC, scrubbing system has been done.
- Acetone vapor detector installed at PETN manufacturing process.
- Bag filter installed in new coal fired boiler 12 TPH.
- The company follows the principle of Zero Liquid Discharge (ZLD).
- EIA study conducted and report submitted to MoEF.
- Environmental Clearance obtained from MoEF CC, New Delhi for expansion and modernization of existing and defence products.
- To fulfill commitment towards tree plantation and conservation of natural resources industry has deposited ₹ 14,03,40,198/- cost towards raising and maintaining afforestation over 90.00 degraded forest land (Comp. No. 1701) at Village Hirapur, at Compartment No. 1701 in the Saoli Forest Range, Dist. Chandrapur .
- A sum of ₹ 4.05 Crores spent on CSR activities in the field of Health care, Safe drinking water, rural development, Education, Environmental protection, water harvesting and public welfare.

PART - I

Any other particulars for improving the quality of the environment

---

- Acetic acid distillation system being installed enabling to concentrate dilute acetic acid and use within the plant.
- Aspect/Impact study of all the process have been done to access the potential environmental risk and controlled measures has been provided.
- Continuous NOx monitoring system installed at acid storage area.
- Reduction of hazardous & non- hazardous waste through process improvements.
- Energy and water conservation and Rainwater harvesting facilities.
- Tree plantation of 5000 nos. sapling will be done during monsoon season for enhancing green belt.
- Around 300 acres land at village Valwad,Tehsil- Rajapur District- Ratnagiri Maharashtra has been developed green belt under Forest Conservation Act.
- Creating sustainable products is a part of SIIL's endeavor towards responsible product stewardship. The company aims to make its products mare safe and environment friendly.

========== End of Statement ==========