इंडियन ऑयल कॉर्पोरेशन लिमिटेड
हल्दिया रिफाइनरी, डाकघर : हल्दिया ऑयल रिफाइनरी - 721606
जिला : पूर्व मेदिनीपुर (प० बंo)

Indian Oil Corporation Limited
Haldia Refinery, P.O. : Haldia Oil Refinery- 721606
District : Purba Medinipur, West Bengal
Website : www.iocl.com, E-mail : haldiarefinery@indianoil.in
Phone : 91-3224-223270

150 YEARS OF CELEBRATING THE MAHATMA

ISO 9001/ISO 14001/OHSAS 18001 CB-035-MS

रिफाइनरीज प्रभाग
Refineries Division

Ref. no.: HR/HSE/700A/ENV 2023-24 **Date :30/09/2024**

To

Chief Engineer,
Operation and Execution cell,
West Bengal Pollution Control Board,
Paribesh Bhavan, 10 A, Block-LA, Sector-III
Salt Lake City, Kolkata - 700106

Subject: Environmental Statement for the financial Year 2023-24

Sir,

Please find enclosed herewith "Environmental Statement for the year 2023-24" of M/s Indian Oil Corporation Ltd, Haldia Refinery.

Thanking you,

Yours faithfully,
On behalf of Indian Oil Corporation Ltd.,

07/10/2024

Dy. General Manager (HS&E)
IOCL, Haldia Refinery
Dist: Purba Medinipur
West Bengal, Pin-721606
Tel. 03224 223642

Encl:
a) Environmental Statement for the year 2023-24 (Form-V)
b) Annexures (Form-4)

ई पांथया, उप महाप्रबंधक (एच, एस एण्ड ई)
E Panthya, Dy. General Manager (H, S & E)
इंडियन ऑयल कॉर्पोरेशन लि., हल्दिया रिफाइनरी
Indian Oil Corporation Ltd., Haldia Refinery

Cc: The Environmental Engineer & In-charge, West Bengal Pollution Control Board, Haldia Regional Office, Haldia, Dist. Purba Medinipur –721602

FORM-V

ENVIRONMENTAL AUDIT STATEMENT FOR THE FINANCIAL YEAR ENDING ON 31ST MARCH, 2024

PART-A

i>	Name and address of the Owner / occupier of the industry, operation or process.	:	Shri Atanu Sanyal Executive Director & Refinery Head Haldia Refinery Indian Oil Corporation Ltd Purba Medinipur -721606.
ii>	Industry category primary / (STC code) Secondary (STC code)	:	Oil Refinery, Red Category Large industry
iii>	Production capacity	:	Design: 8.0 MMT per year During the year 2023-24, 8.059589 MMT Crude processed.
iv>	Year of establishment	:	1975 (commissioned)
v>	Date of last Environmental / Audit Report submitted	:	September 30, 2023

PART-B

WATER AND RAW MATERIAL CONSUMPTION

1> Fresh Water consumption, Quantity in M^3 2023-24

a) Process	3062678
b) Cooling	3037988
c) Domestic	1525210
d) Losses	9850
Total:	**7635726**

a) Includes fresh water for DM water & RO plants.
b) Includes fresh water for Cooling tower(s) make up.
c) Includes Fresh water for Drinking water, PHE/TW water for Service water to refinery + DYIP + BS-VI + Others, PHE/ HFC/TW water to Fire water, Project activities in Refinery only.
d) PHE/ HFC/TW water losses from leak

Name of products / Raw material	Fresh Water consumption per unit of products/raw material, m3/MT	
	2022-23	2023-24
Crude Oil	**0.81**	**0.95**

- All products are obtained from same raw material i.e. Crude oil. Water consumption above has been indicated as M3/MT of Crude processed. Crude processed during the year 2022-2023 & 2023-2024 was 8.505572 MMT and 8.059589 MMT respectively.
- In year 2023-24, Specific fresh water consumption for Sept'23 (1.81 m3/MT crude) was on higher side due to denominator effect due to low crude t'put i.e., 325.11 TMT in view of planned shutdown of various process units in Sept'23 contributing to higher Specific fresh water consumption for FY 2023-24 against FY 2022-23.

2. Raw Material consumption & products yield pattern: Enclosed as Annexure-I.

PART-C

POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT
(PARAMETERS AS SPECIFIED IN CONSENT ISSUED)

a) Water (MINAS Pollutants)

Pollutant	MINAS Limits, in mg/litre	Quantity of pollutants discharged mass/day (Kg/day)	Concentration of pollutants in discharges (mass/volume) mg/litre 2023-24 (avg.)	Percentage of variation from prescribed standard with reasons.
pH	6-8.5	-	7.268	100% COMPLIANCE of Treated Effluent w.r.t. MINAS throughout the year
Phenol	0.35	0.412	0.203	
Sulphide	0.5	0.318	0.156	
Oil Content	5	0.244	0.120	
TSS	20	24.453	12.023	
COD	125	172.570	84.851	
BOD	15	14.177	6.971	
CN	0.2	0.062	0.031	
Ammonia	15	3.252	1.599	
Phosphate	3	0.788	0.388	

Total treated effluent discharged during the year 2023 – 2024 = 744374 M3.

b) Air :-

SO2 – Total emission from refinery (based on monitored data as well as estimated from fuel sulphur)

Avg. SO2 emission during (Apr'2023 to Mar'2024) : **844.75** Kg/Hr

Maximum SO2 emission during (Apr'2023 to Mar'2024) : **911.4** Kg/Hr

Low Sulphur (0.5 wt%) Fuel Oil is being used in all FO fired process heaters.

SO_2 emission is well within stipulated limit of 980 Kg/ hour vide EC file no. J-11011/175/2016-IA-II (I) dated 28.11.2017. It is pertinent to note that ambient air quality at Haldia refinery area is well within the National Ambient Air quality standard and high coastal wind prevailing at Haldia area results in very good dispersion of pollutants.

NOx, SPM and other pollutant emission from refinery are well within range.

PART-D
HAZARDOUS WASTES

Hazardous Wastes Disposed :
(As specified under Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016).

		During the financial year 2022-23	During the financial year 2023-24
1.	* **Residual Oily Sludge**	**14235.0 MT**	**10081.4 MT**
2.	**Spent Catalyst (from FCCU+ ex PTU Catalyst + Hydroprocessing)**	**718.4 MT**	**871.19 MT**
3.	**Spent Catalyst (from spent adsorbent)**	**32.16 MT**	**68.19 MT**
4.	**Waste insulation mineral wool**	**271.2 MT**	**603.56 MT**
5.	**Spent Resin**	**26.86 MT**	**43.29 MT**
6.	**Spent Adsorbent + Spent RO Membrane**	**48.82 MT**	**76.06 MT**
7.	**Used or spent oil**	**0.0**	**1451.21 MT**
8.	**Slop Oil**	-	**24682 MT**

* The treatment method for recovery of oil from raw oily sludge is as described in Part-F.
# Spent catalyst/adsorbent/resin are disposed through West Bengal Waste Management Limited (WBWML) and through authorized recyclers.

Annual Hazardous Waste return submitted for FY 2023-24 is enclosed as Annexure-II.

CHARACTERISTICS OF RESIDUAL SLUDGE AFTER OIL RECOVERY

a>	Oil, % wt	2-10%
b>	Metal content	
-	Lead	Not traceable
-	Chromium	
-	Mercury	

PART- E
SOLID WASTES

	FY 2023-24
1> Solid Wastes	
a) From process: Waste Generated	
➢ **Paper Waste**	**0.5 MT**
➢ **Organic Waste**	**60.12 MT**
➢ **Ferrous scrap**	**1577 MT**
➢ **Non-Ferrous Scrap**	**133 MT**
b) Waste Recovered through Recycling	
➢ **Ferrous scrap**	**1576.79 MT**
c) Waste Recovered through Reusing	
➢ **Organic Waste**	**15 MT**
d) From pollution control facilities:	-
- Bio sludge **	
e) 1. Quantity recycled/ reutilised within the unit	-
2. Sold	-
3. Disposed	-

** Bio sludge is disposed along with other residual oily sludge.

PART-F

The raw oily sludge generated during Tank M&I is removed from Tank and processed through centrifuge, decanter and settling tanks for oil recovery. Recovered oil thus extracted is pumped to refinery slop tank for processing in units to give products. Residual sludge after oil recovery is kept in protected area (HDPE lined residual sludge pits) for disposal through authorized agency such as M/s WBWML and for co-processing by M/s Ambuja Cement Ltd.

Similarly the oily sludge generated from ETP operation is processed in Centrifuge and oil is removed from sludge for reprocess in units. The residual sludge after recovery of oil is similarly kept in the same HDPE lined residual sludge pit for disposal through authorized CHWTSDF, M/s WBWML and co-processing through authorized Cement plant, M/s Ambuja Cements Ltd.

PART-G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES & CONSEQUENTLY ON COST OF PRODUCTION.

1. Water Consumption:

- Treated water is being reused in fire water make up , Cooling tower make up and TTP-RO to generate permeate.
- New ETP of 600 m3/hr has been commissioned in 2010.

- Tertiary Treatment Plant (TTP) having UF/RO was commissioned in 2010 to maximize reuse of treated water in DM plant & Cooling Towers make up.
- This has reduced final discharge quantity of treated effluent.

2. Recovery of oil from oily sludge

- Oil is recovered from oily sludge by heating the oily sludge with low pressure steam in melting pit and by reprocessing the sludge through centrifuge and decanter for recovery of slop oil.

3. Recovery of slop oil from APIs / Holding tank at ETP

- Slop oil is recovered from Influent floating roof holding tanks which is directly transferred to slop oil tank by gravity.
- Slop oil is also recovered from API separators and TPI (Tilted plate inceptors) through skimmer pipe and it is transferred to slop oil tank via pumps.

4. Loss prevention and energy conservation measures

- Energy conservation measures leading to fuel savings of about 39961 SRFT/yr & 55038 SRFT/yr savings has been implemented during FY 2022-23 & FY 2023-24 respectively. Details of ENERGY CONSERVATION AND LOSS REDUCTION SCHEMES IMPLEMENTED DURING LAST TWO YEARS (FY 2022-23 and FY 2023-24) are enclosed as Annexure-III.

NET ZERO INITIATIVES PLANNED FOR EXECUTION IN FY 2024-25

SN	Project/ Scheme description	Annual SRFT Savings	Emission reduction CO2e, MT/Yr
1	Off gas utilization in VDU-1	2000	6200
2	Routing of flare gas from DYIP flare KOD to Refinery Fuel Gas header through FGRS Compressor	1500	4800
3	Processing of surplus sour gas from DYIP SWS as feed in WSA/stoppage of one SRU 2/3 Size – 10"; Line length approx. 1.5 km	2150	6665
4	Installation of online PSV monitoring non-intrusive acoustic sensors in H2 service of HGU-2, OHCU, CGO-HDT & DHDT units	3760	11656
5	VAM/HVAC condensate recovery scheme in BS-VI MCR and SS-62 routing to DYIP CPU condensate header.	973	3115
6	Routing of 6" MP steam header to New flare System and Old Flare system (4") from 14" MP steam line going to FPU unit	1000	3200
7	Condensate recovery from open loop traps of Bitumen tanks 966 & 967	1360	4352

8	Heating of DM water (used in GT for steam generation) by GO-CR in VDU-2	1100	3520
9	Installation of Plate type exchanger to improve rich amine feed temp by 5 °C	1400	4480
10	High Emissivity coating in CDU-1 (Main & Trim), CDU-2 (Main), VDU-2,DCU & CGOT	4500	14400
11	Modifications for processing of full range coker naphtha in CGOT(stoppage of naphtha splitter 4-5 MT/hr MP steam in DCU)	2800	9000
12	MP steam generator: 5 MT/hr (HCGO PA vs BFW) generation in DCU MF circuit	3200	10200
	Total	**25743**	**81588**

5. Tree Plantation and Green Belt Development:

Tree plantation is an ongoing process, during FY 2022-23 & FY 2023-24. Haldia refinery has planted around **661 trees in FY 2023-24 and 2214930 trees cumulative till FY 2023-24.**

- A massive tree plantation (30 lakh tree) initiative has been taken in this year. Plantation will be carried out in the adjacent vacant land in the periphery of Refinery. Also Beliyachar Island and barren land in and around Haldia will be afforested.
- Permission for use of vacant land around 39 acres for future tree plantation has been granted by Haldia Development Authority (HDA) to Haldia Refinery at Geonkhali and Chaitanyapur Water supply facilities, and along the stretch of road from city centre to Balughata.
- Syama Prasad Mukherjee Port Trust (formerly Kolkata Port Trust) has also conveyed "No Objection" for tree plantation by IOCL Haldia Refinery in Green Belt Canal alongside the boundary of Haldia Refinery.
- MOU between West Bengal Forest dept., HDA & Haldia Refinery for tree plantation is under approval of Principal Chief Conservator of Forest Kolkata, which will be valid for next 04 (four) years.
- Plant species will be selected based on sensitivity as well as resistance to Sulphur Dioxide emissions as guided by DFO. Haldia Refinery has already written to DFO in this regard.

PART-H

ADDITIONAL MEASURES/INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

Major Environment Protection Projects Implemented At Haldia Refinery Since Inception

Sl. No.	Environmental Improvement Project	Purpose / Benefits	Investment Rs lakh
1	Debottlenecking of ETP	To meet MINAS	200
2	Sulphur Recovery Unit	To control SO2 emission	2650
3	Installation of 80 meter TPS stacks	For improved dispersion	760
4	Installation of a new Crude Distillation Unit for processing of low sulphur imported crude oil	For generating low sulphur Internal Fuel Oil for burning in TPS furnaces / process heaters	4400
5	Installation of Additional Melting Pit for Oily Sludge	To enhance oil recovery from oily sludge.	24
6	Installation of HDPE lined Sludge Pit	To store Residual Sludge (after oil recovery) and prevent ground water contamination.	22
7	Hard surfacing (with HDPE) of treated water and equilisation pond	To prevent land contamination	22
8	Installation of Meteorological facility		2
9	Continuous SO2 Analysers for Crude Distillation Unit (CDU), Vacuum Distillation Unit (VDU) and Captive Power Plant (CPP) stacks	For online monitoring on Distributed Control System (DCS)	70
10	Installation of Diesel Hydrodesulphurisation Unit (DHDS) along with Hydrogen Unit and Sulphur Recovery Unit.	For reducing sulphur content in diesel from 1.0 wt % to 0.25 % wt./0.05 % wt.	61600
11	Production of Eco-friendly Bitumen Emulsion	Does not require any heating during road making.	462
12	Installation of Continuous ambient	For better monitoring of	45

Sl. No.	Environmental Improvement Project	Purpose / Benefits	Investment Rs lakh
	air monitoring Station inside the refinery	air quality w.r.t. SO_2, NOx and SPM.	
13	Installation of Dual media Filter (Activated Carbon & Sand) at ETP.	For further improvement of Treated effluent and utilise as Make-up in fire water network.	10
14	Use of Advanced Mechanical Liquidation Technology (BLABO of Denmark) for 3 number of Crude Oil Tanks	To maximise oil recovery from tank bottom sludge and minimise residual sludge generation	150
15	Contribution to Haldia Development Authority	For Afforestation	3.5
16	Environment Protection Facilities under Fluid Catalytic Cracking Unit • Amine Absorption / Regeneration • Flue Gas Scrubbing System	To control SO2 emission	3124
17	Augmentation / Modernisation of existing Effluent Treatment Plant	To improve the quality of treated effluent and maximise reuse of treated effluent within the refinery so as to reduce the quantity of effluent discharged from the refinery	1000
18	Modernisation of Storm Water Management System	To improve the quality of storm water discharged from the refinery	300
19	Installation of Incinerator for residual treated sludge	To reduce generation of residual treated sludge	70
20	MS Quality Improvement Project	To reduce Sulphur & Benzene content of petrol supplied from the refinery	35900
21	Common guard pond	To improve the quality of storm water discharged from the refinery	780
22	Regrading of drains	To route the surface run off to the common guard	230

Sl. No.	Environmental Improvement Project	Purpose / Benefits	Investment Rs lakh
		pond	
23	New ETP	For resource conservation	3600
24	Euro-IV diesel with low sulphur(OHCU project)	To reduce global SO2 emission	256900
25	GT-III with HRSG	To control SO2 emission	17500
26	UF/RO based Tertiary Treatment Plant	For resource conservation	5000
27	Commissioning of Floating Oil Drum skimmers	To enhance oil recovery	70
28	Floating fountain		9.1
29	Oil containment booms in guard pond	To enhance oil recovery	4.6
30	Additional Guard Pond	To improve the quality of storm water discharged from the refinery	431
31	Installation of online effluent analyzers(pH, TSS,COD, BOD)	Better monitoring	143.24
32	Installation of PM and CO analyzers in 24 nos. stacks	Better monitoring	389.61
33	Replacement of SOx and Nox analyzers in FOB,LOB nad TPS	For better monitoring of air quality	560.0
33	Augmentation & Upgradation of Ambient Air quality Monitoring station	For better monitoring of air quality	62.6
34	Construction of new HDPE lined	To store Residual Sludge for oil recovery and	218.0

Sl. No.	Environmental Improvement Project	Purpose / Benefits	Investment Rs lakh
	sludge storage pits	prevent ground water contamination	
35	Slop Oil recovery from sludge	For slop oil recovery and reduce generation of sludge	960.0
36	RO reject treatment facility	For quality improvement of treated effluent	49.0
37	Installation of AAQM stations at DYIP area.	For ambient air quality monitoring in DYIP area	300.00
38	ETP-1 Modernization	Capacity augmenting and automation	8666.00
40	AAQ Mobile Van	For ambient air quality monitoring through mobile van	200.90
41	Storm water Management (Neerkund)	Storm water storing	1300.00
	TOTAL		**408188.55 lakhs Say Rs 4081.89 Crore**

Raw material: Crude Oil	FY 2022-23	FY 2023-24
	8505572 MT	8059589 MT
Name of Products	Yield Pattern	
	Yield (% wt) on crude	Yield (% wt) on crude
LPG	3.34%	3.5%
Naphtha (SRN & FGN)	7.19%	7.5%
Gasoline (Motor Spirit)- BS-VI MS	10.72%	11.3%
EBMS	-	0.1%
Aviation Turbine Fuel (ATF)	5.65%	5.7%
Superior Kerosene Oil (SKO & PCK)	1.54%	2.7%
NATO HFHSD	1.16%	0.3%
High Speed Diesel- BS-VI HSD	45.55%	43.2%
LDO	0.89%	1.0%
Jute Batching Oil (JBO)	0.14%	0.2%
Fuel Oil (FO)	2.28%	1.5%
Marpol FO	2.05%	2.1%
Bitumen	4.60%	5.9%
Sulphuric Acid *	0.40%	1.1%
Lube Oil Base Stock (LOBS)	2.89%	2.90%
Sulphur	1.02%	0.9%
Pet Coke	4.72%	4.9%

* Sulphuric Acid production has been started after commissioning of Wet Sulphuric Acid (WSA) plant on 30th Sept 2022.

Annexure-IV

इंडियन ऑयल कॉर्पोरेशन लिमिटेड
हल्दिया रिफाइनरी, डाकघर : हल्दिया ऑयल रिफाइनरी - 721606
जिला : पूर्व मेदिनीपुर (प० बंo)
Indian Oil Corporation Limited
Haldia Refinery, P.O. : Haldia Oil Refinery- 721606
District : Purba Medinipur, West Bengal
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Phone : 91-3224-223270

रिफाइनरीज प्रभाग
Refineries Division

ISO 9001/ISO 14001/OHSAS 18001

Ref. No.: HR/HSE/2024/6H/HWR **Date: 27.06.2024**

To
The Chief Engineer,
Waste Management Cell,
West Bengal Pollution Control Board,
Paribesh Bhavan, 10 A, Block-LA, Sector-III
Salt Lake City, Kolkata - 700106

Subject: Submission of Annual Return (Form-4) for the year 2023-24 under Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016

Respected Sir,

Please find enclosed the copy of Form-4 of Annual Hazardous Waste Return (**Return No: 5394083)** submitted online for FY 2023-24 of IOCL, Haldia Refinery.

Thanking you,

Yours faithfully

27/06/2024

E Panthya
Dy. General Manager (HSE)
IOCL, Haldia Refinery

ई पांथया, उप महाप्रबंधक (एच, एस एण्ड
E Panthya, Dy. General Manager (H,
इंडियन ऑयल कॉर्पोरेशन लि०, हल्दिया रि
Indian Oil Corporation Ltd., Haldia

FORM 4

[See rules 6(5), 13(8), 16(6) and 20 (2)]

Annual Return

under

Hazardous & Other Wastes(Management & Transboundary Movement) Rules, 2016

Transboundary Movement) Rules, 2016

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

Return No : *5394083* **Period :** *2023-2024*

1. Name of facility/Industry **Industry Address of facility/Industry**	*INDIAN OIL CORPORATION LTD, HALDIA REFINERY* *Haldia, P.O-Haldia Oil Refinery, Dist-Purba Medinipur, Pin-721606.*
2. UID	*WB0254691271*
3.Authorisation No **Date of issue:** **Date of Expiry**	*118/2S(HW)-1078/2001 (Pt-II)* *10/09/2021* *31/12/2025*
4. (i) Name of the authorised person & Designation	*ESLAVATH PANTHYA* *DGM (HSE)*
(ii) Correspondence Address	*Haldia Refinery, IOCL, Dist.: Purba Medinipur, West Bengal, Pin:721606*
(iii) Mobile No	*9996140617*
(iv) Land Line No (with area code)	
(iv) Fax number (with area code)	
(vi) e-mail	*panthyae@indianoil.in*
(vii) Type of HW Handler	*Generator*
(viii) If involved in Interstate Movement of HW	*Yes*

5. Production during the year (product wise), wherever applicable

Sr.no	Product Name	Quantity	Unit
1	*LPG*	*279882*	*Metric Ton*
2	*NAPTHA*	*605091*	*Metric Ton*
3	*GASOLINE*	*924200*	*Metric Ton*
4	*SUPERIOR KEROSENE*	*214043*	*Metric Ton*
5	*ATF*	*456133*	*Metric Ton*
6	*HSD*	*3518818*	*Metric Ton*
7	*JUTE BATCHING OIL*	*13915*	*Metric Ton*
8	*FUEL OIL*	*380993*	*Metric Ton*
9	*BITUMIN*	*478188*	*Metric Ton*
10	*LUBE OIL BASE STOCK*	*231713*	*Metric Ton*
11	*PET COKE*	*390921*	*Metric Ton*
12	*SULPHURIC ACID*	*87988*	*Metric Ton*
13	*SULPHUR*	*74396*	*Metric Ton*

Part A. To be filled by hazardous waste generators											
Sr. no	Name of Process	Category	Waste Stream	Unit	Quantity in stock at the beginning of the year	Total quantity of waste generated	Quantity dispatched to disposal facility	Quantity dispatched to recycler or co-processors or pre-processor	Quantity dispatched to others	Quantity utilised in house	Quantity in storage at the end of the year
1	Schedule I - 35.Purification and treatment of exhaust air/gases, water and waste water from the processes in this schedule and common industrial effluent treatment plants (CETPs)	Spention exchange resin containing toxic metals	35.2	Metric Ton	0 Metric Tonnes/Year	43.29 Metric Tonnes/Year	43.29 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
2	Schedule I - 36.Purification process for organic compounds/solvents	Spent carbon or filter medium	36.2	Metric Ton	0 Metric Tonnes/Year	76.06 Metric Tonnes/Year	76.06 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
3	Schedule I - 5.Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications	Wastes or residues containing oil	5.2	Metric Ton	0 Metric Tonnes/Year	603.56 Metric Tonnes/Year	603.56 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
4	Schedule I - 5.Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications	Used or spent oil	5.1	Metric Ton	0 Metric Tonnes/Year	1451.21 Metric Tonnes/Year	0 Metric Tonnes/Year	1451.21 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
5	Schedule I - 4.Petroleum refining or re-processing of used oil/recycling of waste oil	Slop oil	4.3	Metric Ton	3960 Metric Tonnes/Year	23788 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	24682 Metric Tonnes/Year	3066 Metric Tonnes/Year
6	Schedule I - 1.Petrochemical processes pyrolytic operations	Furnace or reactor residue and debris	1.1	Metric Ton	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year

7	Schedule I - 4.Petroleum refining or re-processing of used oil/recycling of waste oil	Oily sludge or emulsion processing of used oil or recycling	4.1	Metric Ton	133 Metric Tonnes/Year	11066.5 Metric Tonnes/Year	7269.6 Metric Tonnes/Year	2811.8 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	1118.0999999999985 Metric Tonnes/Year
8	Schedule I - 4.Petroleum refining or re-processing of used oil/recycling of waste oil	Spent catalyst of waste oil	4.2	Metric Ton	0 Metric Tonnes/Year	939.4 Metric Tonnes/Year	939.4 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
9	Schedule I - 4.Petroleum refining or re-processing of used oil/recycling of waste oil	Spent catalyst of waste oil	4.2	Metric Ton	11.6 Metric Tonnes/Year	229 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	240.6 Metric Tonnes/Year

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

Sr. no	Name of Process	Category	Waste Stream	Unit	Quantity in stock at the beginning of the year	Total quantity received	Quantity treated	Quantity disposed in landfills as such and after treatment	Quantity incinerated (If applicable)	Quantity processed other than specified above	Quantity in storage at the end of the year

Part C. To be filled by recyclers or co-processors or other users

Sr. no	Name of Process	Category	Waste Stream	Unit	Quantity in stock at the beginning of the year	Quantity of waste received during the year from Domestic sources	Quantity of waste received during the year Imported	Quantity recycled or co-processed or used	Quantity re-exported (wherever applicable)	Quantity in storage at the end of the year

Whether Importing Other Wastes	Not-Selected

Part D. Details of Interstate Movement

Sr.no	Name of Industry (Within State)	District	Receiving/Sending	Name of Industry (Other State)	State	Type of Waste	Qty.(MTA)	Purpose (Recycling/ Disposal/Incineration)
1	AMBUJA CEMENTS LIMITED	BALODABAZAR	Sending	AMBUJA CEMENTS LIMITED, BHATAPARA	CHATTISGARH	Residual Oily Sludge	2811.8 MTA	CO-PROCESSING
2	FALAK INDUSTRIALS FUELS PVT. LTD	EAST SINGHBHUM	Sending	FALAK INDUSTRIALS FUELS PVT. LTD	JHARKHAND	USED OIL	13.608 MTA	RECYCLING

Part D. Details of Import of Other Waste Import & Recycling					
Sr.no	Name of the Importer)	Imported from (country name)	Type of Other waste	Quantity Imported (MTA)	Quantity Recycled (MTA)

27/06/2024

E Panthya

Date : *27/06/2024*

Place : *Purba Medinipur*

Name of the Occupier or Operator of the disposal facility

ई पांथया, उप महाप्रबंधक (एच, एस एण्ड ई)
E Panthya, Dy. General Manager (H, S & E)
इंडियन ऑयल कॉर्पोरेशन लि०, हल्दिया रिफाइनरी
Indian Oil Corporation Ltd., Haldia Refinery

Refinery	S.No.	Unit/Area	Scheme description	Category (Inhouse/ PCRA MEA /EIL/ CHT/ RPIP etc)	Envisaged Savings (SRFT/yr)	Actual Completion date (MM-YY)/ Outlook for completion	Actual savings (SRFT/yr)
Haldia Refinery	1	CGOT	CGOT tail gas flaring @ 100kg/Hr reduction by PSA tuning in consultation with Vendor	In-house	800	May'23	800
	2	KHDS	KHDS off Gas H2 Recovery with 94-96% Purity Routing to ROG.	In-house	1200	Apr'23	1200
	3	OHCU	Stoppage of stripping steam in OHCU Gas Oil stripper	In-house	250	Jul'23	250
	4	VDU-2	VDU-2: Stoppage of tempered water air fan coolers and increase HO/IO/LO rundown temperatures and DW water temperature	In-house	350	Jul'23	350
	5	Refinery	Attending PSV and Flare valves passing @ 338 Kg/hr	In-house	2500	Sep'23	2500
	6	CPP	Upliftment of steam lines to avoid submergence and unit interruptions: •TPS to CDU-1 MP steam line (6",CS 60m) •TPS to OHCU MHP line (8", AS 200m) •TPS to DHDS block MP steam line (16",CS,300m)	In-house	1500	Sep'23	1500
	7	Refinery	Emissivity coating of major furnaces CDU-1/2,VDU-1/2 and DCU (Total 8 no. of furnaces)	In-house	5500	Sep'23	5500
	8	DCU	Hot VR Feeding from VDU-1 To DCU	In-house	1540	Oct'23	1540
	9	CPP	Replacement of (IFO) turbo drive (51-PT-13) to motor (51-PM-13) in TPS	In-house	2963	Nov'23	2963
	10	Refinery	Furnace efficiency improvement jobs done during Aug-Sep'23 shutdown in 15 nos. of furnaces: Pigging done in DCU furnace Spalling done in 31-F-01/02 of VDU-1 Damaged deflector plates / CFB blankets / Refractory / burner tips / regen tiles / air registers replaced / repaired in total 15 furnaces APH leak module to module joint leak attended in CGOT (103-F-03) Leaky Cast APH replaced with new one in OHCU (91-F-01) Air duct leak attended in CDU-1 (11-F-01)	In-house	6500	Sep'23	6500
	11	CRU	Reduction of steam consumption in CRU RGC after IGV adjustment & suction enlargement & catalyst change	In-house	9733	Sep'23	9733
	12	Refinery	Redundant steam lines blinding a) MHP to PDA unit b) CRU MP steam line	In-house	500	Sep'23	500
	13	CPP	Rectification of passing MP-LP PRDS bypass valve	In-house	336	Sep'23	336
	14	CPP	S/D related steam leak jobs in offsite pipe rack and CPP	In-house	1946	Sep'23	1946
	15	CRU	CRU PSA tuning and system up gradation to improve H2 recovery and spurious tripping	In-house	1400	Sep'23	1400
	16	CPP	NG infra cost and FG firing in BLR#4 after NG modifications	In-house	6000	Jul'23	6000
	17	CPP	Stoppage of 1 no. Cooling Tower by reorganizing CTs (stoppage of BS-VI CT after shifting load to DYIP CT)	In-house	1000	Dec'23	1000
	18	CPP	Stoppage of one boiler after implementation of HP load shedding logic:	In-house	8000	Dec'23	8000
	19	SRU-2	Stoppage of 1 pump out of 3 running pumps in OHCU Cooling tower	In-house	1440	Nov'23	1440
	20	CPP	Isolation of MHP steam in SRU-2 acid gas preheater (28-E-08).	In-house	300	Dec'23	300
	21	CPP	Stoppage of 1 pump out of 4 running pumps in DHDS Cooling tower	In-house	1280	Dec'23	1280
	23						
Total Savings (SRFT/Yr)					**55038**		**55038**

List of Energy Conservation schemes implemented at IOCL-HR in FY 2022-23

ANNEXURE-III

Refinery	S.No.	Unit/Area	Scheme description	Category (Inhouse/PCRA/EIL/CHT/RPIP etc)	Envisaged Savings (SRFT/yr)	Actual Completion date (MM-YY)	Actual savings (SRFT/yr) FY23
Haldia Refinery	1	VDU-I	Excess air optimization of heaters 31-F-01 & 31-F-02 by replacement of O2 analyzer with TDLS O2 analyser	EIL	38.2	Apr'22	38.2
Haldia Refinery	2	CDU-II	Excess air optimization of the Heaters 16-F-01 by replacement of O2 analyzer with TDLS O2 analyser	EIL	442.6	Apr'22	442.6
Haldia Refinery	3	CPP	Energy Management System (EMS) for utilities, steam and power optimization in HR by M/s Honey Well	In house	3500.0	Oct'22	
Haldia Refinery	4	CPP	Blowdown heat recovery system for 3 nos. of HRSG	EIL	466.8	Jul'22	350.1
Haldia Refinery	5	CDU-II	Excess air optimization of the Heaters 16-F-101 by replacement of O2 analyzer with TDLS O2 analyser	EIL	141.0	Jul'22	105.8
Haldia Refinery	6	Process Furnances	Online chemical cleaning in 08 oil fired furnaces	In house	831.5	Nov'22	415.7
Haldia Refinery	7	DHDT	DHDT PRT revival of feed pump-A and commissioning	In house	252.0	Jun'22	210.0
Haldia Refinery	8	PSVs	PSV passing survey and rectification	Inhouse	3704.0	Ongoing	1852.0
Haldia Refinery	9	CGOT	Commissioning of CGOT PSA system operational	Inhouse	1560.0	Aug'22	910.0
Haldia Refinery	10	DHDT	DHDT RGC vent steam recovery	Inhouse	1778.0	Jul'22	1333.5
Haldia Refinery	11	VDU-1 and CGOT	VDU-1 and CGOT APH rectification	Inhouse	820.0	Jul'22	615.0
Haldia Refinery	12	RFCCU	Flaring from RFCCU Naphtha splitter reduced after debutanizer O/H condenser installation	Inhouse	800.0	Jul'22	600.0
Haldia Refinery	13	SRB	Stoppage of SWS (U-29) old chain	Inhouse	3556.0	Jun'22	2963.3
Haldia Refinery	14	SRB	Stoppage of OHCU SWS (U-94) unit	Inhouse	4148.0	Aug'22	2765.3
Haldia Refinery	15	OM&S	Stoppage of heating steam in 700 & 850 Tank farm	Inhouse	4148.0	Jul'22	3111.0
Haldia Refinery	16	VDU-2	VDU-2 waste heat boiler restoration	Inhouse	5333.0	Jul'22	3999.8
Haldia Refinery	17	DYIP SRB	Optimization of BS-VI and DYIP ARU unit reboiler steam	Inhouse	5926.0	Aug'22	3950.7
Haldia Refinery	18	SRB	SRU-4 chain-2 taken in line resulting in increased steam and sulphur production	Inhouse	4741.0	Jun'22	3950.8
Haldia Refinery	19	VDU-2	Reduction of steam in VDU-2 1st stage ejector @ 10 TPH	Inhouse	5926.0	Aug'22	3950.7
Haldia Refinery	20	VDU-2	Stripping steam reduction in VDU-2 from 12 TPH to 8 TPH	Inhouse	2963.0	Aug'22	1975.3
Haldia Refinery	21	OM&S	Condensate recovery from 650 tank farm area	Inhouse	1010.0	Nov'22	420.8
Haldia Refinery	22	VDU-1/VDU-2	Hot RCO feeding ex-CDU1/2 to VDU-1/2	PCRA	2000.0	Jan'23	500.0
Haldia Refinery	23	WSA	Commissioning of WSA to generate steam and H2SO4	Inhouse	23703.7	Sep'22	5333.3
Haldia Refinery	24		In-situ chemical cleaning of exchangers in CDUs	Inhouse	1000.0	Feb'23	166.7
Total Savings					**78,788.8**		**39,960.7**