



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

To

Date: 02.07.2026

The Regional Officer,
Ministry of Environment, Forest and Climate Change,
Integrated Regional Office, Kolkata IB -198, Sector-III, Salt Lake City,
Kolkata - 700106.

Sub: Submission of Half-Yearly Compliance Report (October, 2025 to March, 2026) for Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes JL No. 85 & 92, Village Sagarbhanga, Durgapur, Dist. Paschim Bardhaman, West Bengal - 713211 by M/s Graphite India Limited.

Ref.: Environmental Clearance Letter No.: IA-J-11011/250/2025-IA-II dated 26.12.2025

Dear Sir

With reference to the aforesaid subject and above cited reference matter, this is to apprise you that company has obtained EC vide letter No IA-J-11011/250/2025-IA-II dated 26.12.2025 for Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes JL No. 85 & 92, Village Sagarbhanga, Durgapur, Dist. Paschim Bardhaman, West Bengal - 713211 by M/s Graphite India Limited under clause 7(ii) a of EIA Notification 2006 amended from time to time.

The company has obtained CTE from West Bengal Pollution Control Board vide Memo no. 49 -2N-08/2020(E) dated 21.01.2026. Company has started construction activities after obtaining CTE from West Bengal Pollution Control Board & still in construction phase.


We are hereby submitting the Half Yearly Compliance Report (October, 2025 to March, 2026) of the conditions stipulated in our Environment Clearance letter issued by MoEF&CC, New Delhi.

This is for your kind consideration and records.

Thanking you and with regards,

Yours faithfully,

M/s Graphite India Limited


Ranadeep Chakraborty (Sr. VPW)
(Authorized Signatory)

Enclosed: Half Yearly Compliance Report (October, 2025 to March, 2026)

Cc - The Director,

Ministry of Environment, Forest & Climate Change (MoEFCC)

Govt. of India, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003

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HALF YEARLY ENVIRONMENTAL COMPLIANCE REPORT

(October 25 to March 26)

EC Letter No.:

F. No. IA-J-11011/250/2025-IA-II dated 26.12.2025

**Proposed Expansion of Capacity
from 67 KTPA to 80 KTPA
Graphite Electrodes**

At

**JL No. 85 & 92, Village Sagarbhanga,
Durgapur, Dist. Paschim Bardhaman, West Bengal**

APPLICANT



M/s Graphite India limited

Regd. Office: 31 Chowringhee Road, Kolkata - 700 016

Works- Graphite India Limited, Village-Sagarbhanga,

Tehsil-Durgapur, District-Paschim Bardhaman, West Bengal-713 211

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सत्यमेव जयते

File No: IA-J-11011/250/2025-IA-II
Government of India
Ministry of Environment, Forest and Climate
Change
IA Division



Date 26/12/2025



To,

Shri. RANADEEP CHAKRABORTY
M/s. GRAPHITE INDIA LIMITED
PO. SAGARBHANGA DURGAPUR, PASCHIM BARDHAMAN, WEST BENGAL, 713211
mrdgp@graphiteindia.com

Subject: **Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes at JL No. 85 & 92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal by M/s Graphite India Limited - Grant of prior Environmental Clearance (EC) to the proposed project under the provision of the EIA Notification 2006.**

Sir/Madam,

This is in reference to your application submitted to MoEF&CC vide proposal number IA/WB/IND2/544034/2025 dated 02/09/2025 for grant of prior Environmental Clearance (EC) to the proposed project under the provision of the EIA Notification 2006 and as amended thereof.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC25B2301WB5490851N
(ii) File No.	IA-J-11011/250/2025-IA-II
(iii) Clearance Type	Fresh EC
(iv) Category	B1
(v) Project/Activity Included Schedule No.	5(e) Petroleum products and petrochemical based processing such as production of carbon black and electrode grade graphite (processes other than cracking)
(vi) Sector	Industrial Projects - 2
(vii) Name of Project	Proposed Expansion of capacity from 67 KTPA to 80 KTPA at JL No. 85 & 92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal by Graphite India Limited
(viii) Name of Company/Organization	GRAPHITE INDIA LIMITED
(ix) Location of Project (District, State)	PASCHIM BARDHAMAN, WEST BENGAL

(x) Issuing Authority
 (xi) Applicability of General Conditions as per
 EIA Notification, 2006

MoEF&CC

Yes

3. The Ministry of Environment, Forest and Climate Change has examined the proposal for proposed expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes at JL No. 85 &92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal by M/s Graphite India Limited.

4. The proposal was considered in EAC (Ind-2) meeting held on 18th September, 2025 wherein the project proponent and their accredited Consultant M/s. J.M Enviro Net Private Limited (NABET certificate no. NABET/EIA/2326/RA 0308 and validity- August 7, 2026) made a detailed presentation on the salient features of the project. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B, Part C EIA, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code available above.

5. All Products are listed at S. No. 5(e) of Schedule of Environment Impact Assessment (EIA) Notification 2006 as amended to date and the project is outside the notified industrial area, hence is categorized as category 'A' project and will be appraised at Central Level by Expert Appraisal Committee (EAC). Additionally, the project falls under the Severely Polluted Area (CPA) in Durgapur hence general conditions are also applicable.

6. The details of products and capacity are enclosed at Annexure-2.

7. SEIAA, West Bengal has issued Environmental Clearance to the existing capacity of Expansion of 52 KTPA to 67 KTPA vide File No. EN/T-II-1/128/2021 dated 10.03.2023. Certified Compliance report of existing EC has been obtained from West Bengal Pollution Control Board; Kolkata vide Memo No. No.11068-4A/18/2008 (Pt.VI) dated 28/08/2025. Date of Site Visit is 07/08/2025 due to non-issuance of Certified Compliance Report from the concerned IRO, sub-office, Kolkata. (Compliance as per OM dated 08.06.2022).

Implementation Status of the existing EC:

S. No.	Units	UoM	Existing 67KTPA	Reference	Status of Implementation
1.	Extrusion-1	MTPH	4.44*	-	Implemented
2.	Extrusion -2	MTPH	12	E.C vide File No. EN/T-II-1/128/2021 dated 10.03.2023	
3.	Baking RH 14 Sec Furnace	MT/charge	42	CTO vide CTO No. WBPCB/4403447/2023 dated 05.01.2024 valid till 30.11.2028	
4.	Baking RH 16 Sec Furnace	MT/charge	80		
5.	Baking RH 24 Sec Furnace (I)	MT/charge	80		
6.	Baking RH 24 Sec Furnace (II)	MT/month	2775		
7.	Baking RH 24 Sec Furnace (III)	MT/month	2775		
8.	Re-Baking Tunnel Kiln 1	MT/month	3360		
9.	Re-Baking Tunnel Kiln 2	MT/month	3360		
10.	Pitch	MT/charge	6.9		

	Impregnation unit 2 & unit 3				
11.	Pitch Impregnation unit 4	MTPA	56924		
12.	Acheson	MT/charge	40		
13.	Lengthwise Graphitization unit 3	MT/charge	25		
14.	Lengthwise Graphitization unit 4	MT/month	3180		
15.	Lengthwise Graphitization unit 5	MT/month	2740		
16.	Finishing Unit 1 & 2	MT/month	420		
17.	Finishing Unit 3	MT/month	2582		
18.	Finishing Unit 4	MT/month	2582		
*4.44 MTPH in the existing capacity will be removed due to introduction of new technology in Extrusion 1, therefore only 12 MTPH will be final capacity after expansion					

8. Standard ToR and PH are not applicable since the proposal is applied under para 7(ii) of EIA Notification, 2006 and in line with Ministry's OM dated 11th April, 2022. PP has informed that there is no litigation pending against the project.

Compliance of the criteria given in MOEFCC, OM dated 11th April, 2022, para 4(i-ix) under 7(ii):

S. No.	Criteria	Reply
1.	Project should have gone through the public hearing process, at least once, for its existing EC capacity on which expansion is being sought, except those category projects which have been exempted as per para 7 III(i) of EIA Notification 2006 and its amendments.	Public Hearing was held on 27.05.2022 for the Last EC obtained for "Proposed Expansion of Capacity From 52KTPA To 67KTPA".
2.	There should not be change in category of the project from 'B2' to 'B1' or 'A' due to proposed modernization or expansion.	The category of the project will remain "B1" for the proposed expansion project. There will not be any change in category from "B2" to B1 or A. The project will be appraised as Category "A" because the plant site falls in Severely Polluted Area.
3.	There is no additional land acquisition or forest land diversion involved for the proposed expansion or there is no increase in lease area with regard to mining vis-a-vis the area mentioned in the EC, based on which public hearing has been held earlier.	The proposed expansion will be done within the existing plant premises. No additional land acquisition will be required for the proposed expansion.
4.	The proposed expansion shall not be more than 50% of production capacity as mentioned in the prior EC, issued on the basis of public hearing held and the same shall be allowed in minimum three phases.	Last Expansion Capacity was 67000 Mt/Annum. Further proposed Expansion is additional 13000 MT/annum which is 19.4% of last EC.

6.	The proposed expansion should not result in reduction in greenbelt area as stipulated in earlier EC, or if the existing ratio of greenbelt is more than 33%, after expansion it should not reduce below 33%.	Noted and agreed to. The proposed expansion shall not result in reduction in the greenbelt area as stipulated in EC. More than 33% of total area is already developed as greenbelt. The company will increase this greenbelt from 34.87% to 40%. As part of CEPI Action Plan, the greenbelt will be increased to 40% as avenue plantation due to space constraint inside the plant premises. The company has obtained relevant permissions from authorities for development of greenbelt outside plant.
7.	The project proponent should have satisfactorily complied the conditions stipulated in the existing EC(s) and satisfactorily fulfilled all the commitments made during the earlier public hearing/ consultation proceedings and also the commitments given while granting previous expansion, as may be applicable. This shall be duly recorded in the certified compliance report issued by the IRO/CPCB/SPCB, which should not be more than one year old at the time of submission of application.	The company regularly submits six monthly compliances. Latest EC six monthly compliance report has been submitted online. Status of Implementation of the commitments made during earlier Public Hearing has been incorporated in Chapter 7 of the EIA/EMP Report. Certified CTO Compliance report has been obtained Memo No.10880 (1)4A/18/2008 (Pt.V) dated 23/06/2025. Date of Site Visit is 22/05/2025. Latest Certified EC Compliance Report has been obtained via Memo No.11068-4A/18/2008(Pt.VI) dated 28.08.2025. Date of Site Visit-07.08.2025.
8.	Public consultation shall be undertaken (if applicable as per table below) by obtaining response in writing, as per para 7 III (ii)(b) of EIA Notification 2006, except those categories of projects which have been exempted as per para 7 III(i) of EIA Notification 2006 and its amendments.	Public Hearing was held on 27.05.2022 for the Last EC obtained for "Proposed Expansion of Capacity From 52KTPA To 67KTPA". As per para 5 (II) of OM dated 11.04.2022, the proposed expansion is exempted from public consultation.
9.	Effluent monitoring including air quality monitoring systems as specified in the existing EC, if stipulated, should have been installed.	Effluent Monitoring as well as Air quality monitoring systems have already been installed in line with the conditions stipulated in existing EC and Consents.

9. Total plant area after expansion will be 22.44 Ha. No additional land will be acquired for the expansion project as the same will be done within existing plant premises. Out of the total plant area i.e., 6.52 hectares area has already been developed under greenbelt/plantation in plant premises. Further, as permitted existing EC additional greenbelt of 1.3 ha was developed in the colony nearby making cumulative greenbelt of 7.82 i.e., 34.87% of the total project area. As part of CEPI Action Plan, the greenbelt will be increased to 40% as avenue plantation in 1.156 ha land nearby due to space constraint inside the plant premises. The company has obtained permission along with layout from Asansol Durgapur Development Authority vide memo no. ADDA/DGP/PC-56/25-26(60) dated 24/06/2025 for development avenue plantation along roadside of two patch of land. Hence, after expansion 8.976 Ha, 40% will be covered under plantation. The estimated project cost for expansion is Rs. 315 Crores. Capital cost of EMP would be Rs. 3.25 crores and recurring cost (entire plant) for EMP would be Rs. 2.824 crores per annum. Industry proposes to allocate Rs. 3.1 Crores towards extended EMP. Total Employment for Construction Phase is 150 for Contractual. No additional manpower during operation phase required for the expansion project.

10. There are no national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance. Durgapur PF is at distance ~4.8 km in North East Direction from plant site and Beliature RF is at a distance of ~9.0 km in South West direction from plant site. Conservation Plan for Schedule 1 species has been submitted to DFO, Durgapur, Social Forestry Division dated 03/07/2025 and currently under process and a budget of 0.25 crores has been earmarked for the same. Water bodies: DVC Canal (~0.5 km in South), Damodar River (~2.5 km in SSW direction from Plant site), Tamla Nala (~5.0 km in NW direction from Plant site), Barjora Nala (~5.30 km in WSW direction from Plant site), Damodar Branch Canal (~6.0 km in East), Tartari Nala (~8.20 km in WSW direction from Plant site) and Kunur Nala is at distance of ~8.5 km in NNE direction from Plant site. The company has obtained No Flood NOC from Office of the Executive Engineer, Damodar Headworks Division via Memo No.918 dated 25/04/2025 stating that the site does not fall in flood prone zone as per last 25 years data.

Project site proximity to sensitive area	Details
Habitation	Veerakkalpuddur (Population: 2500) at 0.15 km in SE
School	Ramesh Vidhyashram Matriculation School at 0.01 km in E
River/Waterbody	Kaveri River 0.6km W Mettur Dam at 3.81 km in SW
Archaeological Survey of India (ASI) protected site	None
Compliance of MoEF&CC OM dated 14/02/2022 regarding sitting of Industries in close proximity of river	NA

11. Ambient air quality monitoring was carried out at 8 locations during March to May 2025 and the baseline data indicates the ranges of concentrations as: PM10 (36.6 to 143.2 $\mu\text{g}/\text{m}^3$), PM 2.5 (21.2 to 72.6 $\mu\text{g}/\text{m}^3$), SO₂ (5.9 to 20.9 $\mu\text{g}/\text{m}^3$), and NO_x (12.0 to 37.0 $\mu\text{g}/\text{m}^3$). AAQ modeling study for all point source emissions indicates that the maximum incremental GLCs after the proposed expansion would be PM10- 0.70 $\mu\text{g}/\text{m}^3$, PM2.5- 0.52 $\mu\text{g}/\text{m}^3$,NO_x- 1.27 $\mu\text{g}/\text{m}^3$, SO₂- 1.63 $\mu\text{g}/\text{m}^3$, CO- 0.00137 mg/m³ and Cl₂- 0.00003 $\mu\text{g}/\text{m}^3$. The resultant concentrations at all AAQ locations are within the National Ambient Air Quality Standards (NAAQS).

12. Total fresh water requirement after expansion will be 843 CMD which will be met from Durgapur Projects Limited vide Agreement No. WW/14-N-I/Graphite/91/30 vide Date- 22nd of June, 1990. Existing effluent generation is 284 CMD which is treated through ETP 1 & 2 of capacity 168 CMD and WWTP (cooling water filter) of capacity 1440 CMD. Proposed effluent generation will be 200 CMD which will be treated through existing ETP and WWTP (cooling water filter) as well as proposed ETP of capacity 300 CMD. Domestic waste water is being/will be treated in STP (Capacity of STP in 10 KLD and 20 KLD). The plant is being/will be based on Zero Effluent discharge system and treated effluent/water shall not be discharged outside the factory premises.

13. Total power requirement after expansion will be 65 MW which will be sourced from Damodar Valley Corporation. Enhancement of Contract demand has been finalized between Damodar Valley Corporation and Graphite India Limited vide Contract No. Coml./CD enhancement/GIL/Durgapur 2729 dated 28th Nov,2017. Existing unit has 1.5 Tonn and a standby boiler of 2 Tonn, CBM fired Boiler. No APCE is installed as it is CBM fired. No boiler is proposed for the expansion project and current facility in Extrusion 1 unit will be dismantled. Industry has 11x 500, 2x 250, 1x750, 2x1010, 2 x 630KVA DG set and proposed 2x1010 KVA DG Set which is/will be used as standby during power failure with adequate stack height is/will be provided as per CPCB norms to the proposed DG sets.

14. Details of Process emissions generation and its management: The stack emission details of existing and stacks after

expansion are mentioned at Annexure - 5. There will not be any addition of new stacks; old stacks in extrusion 1 will be utilized for proposed expansion after modifications.

15. Details of solid waste/Hazardous waste generation and its management:

Solid waste:

- Graphite Fines: 12,340 TPA (existing) to 14,734 TPA (post-expansion)
- Graphite End Cut Scrap: 960 TPA (existing) to 1,146 TPA (post-expansion).
- Graphite Burnt Spacer Scrap: 970 TPA (existing) to 1,158 TPA (post-expansion).
- Graphite Electrode/Nipple Scrap: 180 TPA (existing) to 215 TPA (post-expansion).
- CPC Residue Fines (from LWG & Coke fines from Macawber Pack Media System): 610 TPA (existing) to 728 TPA (post-expansion).
- CPC Residue Fines (RH + Baked Turning Chips): 2,880 TPA (existing) to 3,439 TPA (post-expansion).
- Pitch Coke: 1,700 TPA (existing) to 2,030 TPA (post-expansion).
- Metcoke Residue Fines -35 (Demco fines): 10,580 TPA (existing) to 18,090 TPA (post-expansion).
- Metcoke Residue Fines (Rejected): 3,600 TPA (existing) to 4,299 TPA (post-expansion) - Will be sold to Steel and Carbon Industries.

Hazardous waste:

- The hazardous wastes generated from the plant include Used Oil/Waste Oil (Existing 18 KL/annum, after expansion-21.50 KL/annum) and Oily Waste Sludge (Existing-18.5 KL/annum, after expansion-22.13 KL/annum), both of which are sent to WBPCB/CPCB authorized recyclers.
- ESP Coal Tar Residue (Existing -480.9 MTPA, after expansion- 574.19 MTPA), Empty/Discarded Drums, Containers, Barrels (Existing-2 MTPA, after expansion-2.39 MTPA), Discarded Asbestos (Existing-6.886 MTPA, after expansion-8.22 MTPA), Oily Cotton Waste (Existing-20.833 MTPA, after expansion-24.88 MTPA) and ETP Sludge (Existing-5 MTPA, after expansion-10.97 MTPA) are disposed to CHWTSDF through the manifest system and authorized recyclers.
- Additionally, Thermocole (Existing-0.177 MTPA, after expansion-0.21 MTPA) and Metwrap (Existing-4.756 MTPA, after expansion-5.68 MTPA)- The company has obtained registration as Importer for disposal of Plastic waste generated due to plastic packaging.

The EAC noted that the proposed expansion in Durgapur Severely Polluted Area. Accordingly, the project proponent has submitted compliance to Ministry's OM dated 31st October, 2019 for the projects located in CP which is given below:

S. No.	Stipulation of conditions	Compliance
1.		Air
i	Stack emission levels should be stringent than the existing standards in terms of the identified critical pollutants.	Noted and will be complied. Stack emission levels is being/will be maintained as per EC conditions, CPCB & WBPCB standards.
ii	CEMS may be installed in all large/medium red category industries (air polluting) and connected to SPCB and CPCB server.	CEMS is already installed with existing stacks and connected to CPCB/WBPCB servers as per last EC and will be installed with the proposed stacks also.
iii	Effective fugitive emission control measures should be imposed in the process, transportation, packing etc.	Effective fugitive emission control measures are already being followed: <ul style="list-style-type: none"> • Transportation of raw materials and products are by covered vehicles only. • Extensive dust extraction networks are provided. Water spraying on roads and construction site will prevent fugitive dust. • Mobile vacuum dust sweeping system on industrial roads and vacuum dust cleaning system for plant area exist to control airborne dust due to the vehicles movement. Regular road washing is being done on internal roads. • Covered storage facilities are/will be provided. • Proper greenbelt development and plantation inside and outside

		the plant premises.
iv	Transportation of materials by rail/ conveyor belt, wherever feasible.	Transportation of materials by rail/ conveyor belt is already being followed as per applicability.
v	Encourage use of cleaner fuels (pet coke/ furnace oil/ LSHS may be avoided).	Use of Cleaner fuel like CBM is being/will be followed. There is no usage of pet coke/ furnace oil/ LSHS in plant.
vi	Best Available Technology may be used. For example; usage of EAF/SAF/ IF in place of Cupola furnace. Usage of Supercritical technology in place of sub-critical technology.	Best Available Technology is being used, and for expansion, old technology (Paddle Technology) will be replaced with new technology (Eirich Technology) in Extrusion-1 unit which will reduce the consumption of energy and water.
vii	Increase of green belt cover by 40% of the total land area beyond the permissible requirement of 33%, wherever feasible.	Present green belt is 34.87% (plant + colony). The greenbelt will be increased to 40% as avenue plantation due to space constraint inside the plant premises. The company has obtained relevant permissions from authorities for development of plantation outside plant. After expansion, total greenbelt will be 8.976 ha.
viii	Stipulation of greenbelt outside the project premises such as avenue plantation, plantation in vacant areas, social forestry, etc.	To increase the greenbelt to 40%, avenue plantation is being done. The company has obtained relevant permissions from authorities for development of plantation outside plant. After expansion, total greenbelt will be 8.976 ha.
ix	Assessment of carrying capacity of transportation load on roads inside the industrial premises. If the roads required to be widened, shall be prescribed as a condition.	Roads inside the plant premises are already paved and widened for accommodating transportation load. The existing traffic is under LOS category B i.e., Volume is 919 PCU/hr at SH-09 and after the proposed project, the volume will increase to 45 PCU/hr, the total Volume will be 964 PCU/hr. Therefore, the category remains LOS B.
2.	Water	
i	Reuse/recycle of treated wastewater, wherever feasible.	Plant is completely Zero Effluent Discharge based and reuse and recycle of water is being/will be done inside plant premises.
ii	Continuous monitoring of effluent quality/quantity in large and medium Red Category Industries (water polluting).	Monitoring of effluent is being done and test reports for the same has been enclosed with every half-yearly compliance report.
iii	A detailed water harvesting plan may be submitted by the project proponent	Rainwater is being collected inside premises from rooftop near the admin building. Water harvesting Plan is being followed and will be continued after expansion.
iv	Zero liquid discharge wherever techno economically feasible.	Zero Effluent Discharge is being/will be followed.
v	In case, domestic waste water generation is more than 10 KLD, the industry may install STP.	Waste water generated from the domestic activities is being/will be sent in capacity of STP 1 (10 KLD) and STP 2 (20 KLD). Water from STP is being/ will be used in greenbelt & dust suppression.
3.	Land	
i	Increase of green belt cover by 40% of the total land area beyond the permissible requirement of 33%, wherever, feasible for new projects.	Present green belt is 34.87% (plant + colony). The greenbelt will be increased to 40% as avenue plantation due to space constraint inside the plant premises. The company has obtained relevant permissions from authorities for development of plantation outside plant. After expansion, total greenbelt will be 8.976 ha.
ii	Stipulation of greenbelt outside the project premises such as avenue plantation, plantation in vacant areas, social forestry, etc.	To increase the greenbelt to 40%, avenue plantation is being done. The company has obtained relevant permissions from authorities for development of plantation outside plant. After expansion, total greenbelt will be 8.976 ha.
iii	Dumping of waste (fly ash, slag, red	There is no generation of fly ash, slag, red mud in the plant. Used

	mud, etc.) may be permitted only at designated locations approved by SPCBs/ PCCs.	oil/waste oil is being sent to WBPCB/CPCB Authorized Recyclers. Hazardous waste is disposed to the CHWTSDF through Manifest system and authorized recyclers. Registration as Importer for disposal of Plastic waste generated due to plastic packaging has been obtained for the disposal of thermocole and metwrap.
iv	More stringent norms for management of hazardous waste. The waste generated should be preferably utilized in co-processing	Hazardous waste is disposed to the CHWTSDF through Manifest system and authorized recyclers.
4.	Other Condition (Additional):	
i	Monitoring of compliance of EC conditions may be submitted with third party audit every year.	Monitoring of compliance of EC conditions will be submitted with third party audit every year.
ii	The % of the CER may be at least 1.5 times the slabs given in the OM dated 01.05.2018 for SPA and 2 times for CPA in case of Environmental Clearance.	As per granted EC, the budget for CER activities is 103.5 lakhs to be spent in next 6 years, out of which the company has spent Rs.33.86 lakhs up to March, 2025 on CER activities under various heads. The remaining amount of 69.64 lakhs is being utilized as per the plan. Additional as part of this expansion, company has allocated CER budget of 310 lakhs.

16. During deliberations, EAC discussed following issues:

- EAC desired the pollution load comparison for the existing project and after the proposed expansion. As per the pollution load analysis submitted by PP, it was noted that fresh water requirement and effluent generation will be decreased by 57 KLD and 84 KLD due to replacement of Extrusion 1 old setup with new technology. Stack emissions of PM, SO_x and NO_x will be reduced by 4.2 g/sec, 1.6 g/sec and 1.9 g/sec respectively as Paddle Furnace will be replaced with a new Eirich mixer setup along with the relevant equipment in Extrusion 1 facility. However, it was noted that there shall be increase in solid and hazardous waste generation as the overall production capacity is increasing.
- It was also noted that as per EC, greenbelt of 6.52 ha (within the plant) and 1.3 ha (in the colony nearby) was developed making total area of 7.82 ha i.e., 34.87% of the total area of the project. As part of CEPI Action Plan, the additional greenbelt of 1.156 ha as avenue plantation due to space constraint inside the plant premises making total greenbelt of 8.976 has i.e., 40% total project area. For the same, company has obtained permission from Asansol Durgapur Development Authority vide memo no. ADDA/DGP/PC-56/25-26(60) dated 24/06/2025 for development avenue plantation along roadside of two patch of land. In this regard, EAC suggested that greenbelt developed outside the plant i.e., colony and avenue plantation along road side shall maintained by the project proponent till the life of the Industry.

The committee was satisfied with the response provided by PP on above information. Further, Committee desired to submit the above information in writing. Accordingly, PP has submitted the desired information and EAC found the information/commitments satisfactory.

17. The EAC, constituted under the provision of the EIA Notification, 2006 and comprising of Experts Members/domain experts in various fields, have examined the proposal submitted by the Project Proponent in desired form along with the EMP report prepared and submitted by the Consultant accredited by the QCI/ NABET on behalf of the Project Proponent. The EAC noted that the Project Proponent has given undertaking that the data and information given in the application and enclosures are true to the best of his knowledge and belief and no information has been suppressed in the report. If any part of data/information submitted is found to be false/ misleading at any stage, the project will be rejected and Environmental Clearance given, if any, will be revoked at the risk and cost of the project proponent.

18. The Committee noted that the EIA/EMP report is in compliance of Standard ToR applicable to the project activity reflecting the present environmental concerns and the projected scenario for all the environmental components. The

Committee has found the baseline data is within NAAQ standards. The Committee has deliberated the action plan proposed by the project proponent to arrest the incremental GLC due to the project. The Committee has also deliberated on the Extended EMP plan and found to be addressing the issues in the study area. The EAC has deliberated the proposal and has made due diligence in the process as notified under the provisions of the EIA Notification, 2006, as amended from time to time and accordingly made the recommendations to the proposal. The Experts Members of the EAC have found the proposal in order and have recommended for grant of environmental clearance.

19. The environmental clearance granted to the project/activity is strictly under the provisions of the EIA Notification 2006 and its amendments. It does not tantamount/construe to approvals/consent/ permissions etc. required to be obtained or standards/conditions to be followed under any other Acts/ Rules/ Subordinate legislations, etc., as may be applicable to the project. The project proponent shall obtain necessary permission as mandated under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981, as applicable from time to time, from the State Pollution Control Board, prior to construction & operation of the project.

20. Based on the proposal submitted by the project proponent and recommendations of the EAC (Industry-2), Ministry of Environment, Forest and Climate Change hereby accords environmental clearance to the project proposed expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes at JL No. 85 &92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal by M/s Graphite India Limited, under the provisions of the EIA Notification, 2006, and the amendments therein, subject to compliance of the terms and conditions enclosed at Annexure-1.

21. The Ministry reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The Ministry may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

22. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

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

24. The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.

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

Copy To

1. The Principal Secretary, Department of Environment & Forest, 5th Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector III, Bidhannagar, Kolkata – 700 106.
2. The Regional Officer, Ministry of Environment, Forest and Climate Change, Integrated Regional Office, Kolkata IB – 198, Sector-III, Salt Lake City, Kolkata - 700106.
3. The Member Secretary, Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi - 32.
4. The Member Secretary, West Bengal Pollution Control Board, Paribesh Bhawan 10A, Block-LA, Sector-III Bidhannagar, Kolkata-700 106.
5. Compliance & Monitoring Division, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi.
6. District Collector, Paschim Bardhaman, West Bengal.
7. Guard File/Monitoring File/ Parivesh Portal /Record File.

Annexure 1

Specific EC Conditions for (Petroleum Products And Petrochemical Based Processing Such As Production Of Carbon Black And Electrode Grade Graphite (Processes Other Than Cracking))

1. Petroleum Products And Petrochemical Based Processing

S. No	EC Conditions
1.1	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry (Annexure - 3). All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.
1.2	The project proponent shall prepare a site specific conservation plan and wildlife management plan in case of the presence of Schedule-1 species in the study area, as applicable to the project, and submit to Chief Wildlife Warden for approval. The recommendations shall be implemented in consultation with the State Forest/Wildlife Department in a time bound manner.
1.3	The total fresh water requirement after expansion shall not exceed 843 KLD, which shall be met from Durgapur Projects Limited. Existing effluent generation is 284 CMD which is treated through ETP 1 & 2 of capacity 168 CMD and WWTP (cooling water filter) of capacity 1440 CMD. Proposed effluent generation shall be 200 CMD which shall be treated through existing ETP and WWTP (cooling water filter) as well as proposed ETP of capacity 300 CMD. Domestic wastewater shall be treated in the STPs installed (10 & 20 KLD). The plant will operate on a Zero Liquid Discharge (ZLD) system, and treated effluent shall not be discharged outside the factory premises.
1.4	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.
1.5	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.
1.6	Process organic residue and spent carbon, if any, shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF.
1.7	Regular VOC monitoring shall be done at vulnerable points. A Leak Detection and Repair (LDAR) Standard Operating Procedure (SOP) shall be strictly enforced.
1.8	The oily sludge shall be subjected to melting pit for oil recovery and the residue shall be bio-remediated. The sludge shall be stored in HDPE lined pit with proper leachate collection system.
1.9	Oil catchers/oil traps shall be provided at all possible locations in rain/ storm water drainage system inside the factory premises.
1.10	The company shall undertake waste minimization measures as below: (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapour recovery system. (f) Use of high pressure hoses for equipment cleaning etc. to reduce wastewater generation.

S. No	EC Conditions
1.11	Greenbelt of 5-10 m greenbelt has been developed in an area 6.52 ha within the plant. Further, greenbelt of 1.3 ha was developed in the colony nearby making total area of 7.82 ha i.e., 34.87% of the total area of the project. An additional greenbelt of 1.156 ha shall be developed as avenue plantation due to space constraint inside the plant premises making total total greenbelt of 8.976 has i.e 40% total project area. The company has obtained permission from Asansol Durgapur Development Authority vide memo no. ADDA/DGP/PC-56/25-26(60) dated 24/06/2025 for development avenue plantation along roadside of two patch of land which shall maintained by the project proponent till the life of the Industry. Indigenous species shall only be planted as part of greenbelt and non-indigenous / alien species shall be replaced with native species. No invasive or alien or non-native tree species shall be selected for plantation. PP shall plant at least 20 variety of species as a part of greenbelt. Saplings 4-6 feet high shall be planted. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department and native species shall be developed. Records of tree canopy shall be monitored through remote sensing map. Trees shall be planted in the Green Belt under the campaign #Plant4Mother #एक पेड़ माँ के नाम and uploaded on the MeriLiFE portal (https://merilife.nic.in/).
1.12	PP proposed to allocate Rs. 3.10 Crores towards extended EMP which shall be spent as submitted as per action plan (Annexure - 4) within 3 years in consultation with District Administration. All the commitments made in Public Hearing shall be completed within the timeline as per action plan submitted.
1.13	A separate Environmental Management Cell (having qualified person with Environmental Science/ Environmental Engineering/ specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.
1.14	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.
1.15	All the existing and proposed stacks shall not exceed the emission limits prescribed in the tables mentioned at Annexure - 5. Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server.
1.16	Industry shall allocate at least Rs. 0.50 Crore for Occupational Health Safety for establishing occupational health Centre for surveillance of the worker's health within the plant on a regular basis. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.
1.17	The National Emission Standards for Petrochemical (Basic & Intermediates) issued by the Ministry vide G.S.R. 820 (E) dated 9 th November, 2012 as amended time to time shall be followed.
1.18	Recommendations of mitigation measures from possible accident shall be implemented based on advanced risk Assessment studies conducted for worst case scenarios using latest techniques.
1.19	PP shall sensitize and create awareness among the people working within the project area as well as its surrounding area on the ban of Single Use Plastic in order to ensure the compliance of Notification published by MOEFCC on 12 th August, 2021. A report along with photographs on the measures taken shall also be included in the six-monthly compliance report being submitted to concerned authority.

S. No	EC Conditions
1.20	The project proponent shall ensure the compliance of the Ministry's OM dated 14th January 2025 w.r.t. streamlining the implementation of Notifications G.S.R. 702 and G.S.R. 703 dated 12th November 2024.
1.21	The plantation under Green Credit Program by the Project Proponent shall not be eligible for site-specific plantation clearance forming part of Environment Clearance.

2. General Conditions

S. No	EC Conditions
2.1	No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.
2.2	The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.
2.3	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).
2.4	The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. Extended EMP activities shall be undertaken by involving local villages and administration and shall be implemented. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.
2.5	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.
2.6	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.
2.7	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.
2.8	The environmental statement for each financial year ending 31 st March in Form-V as is mandated

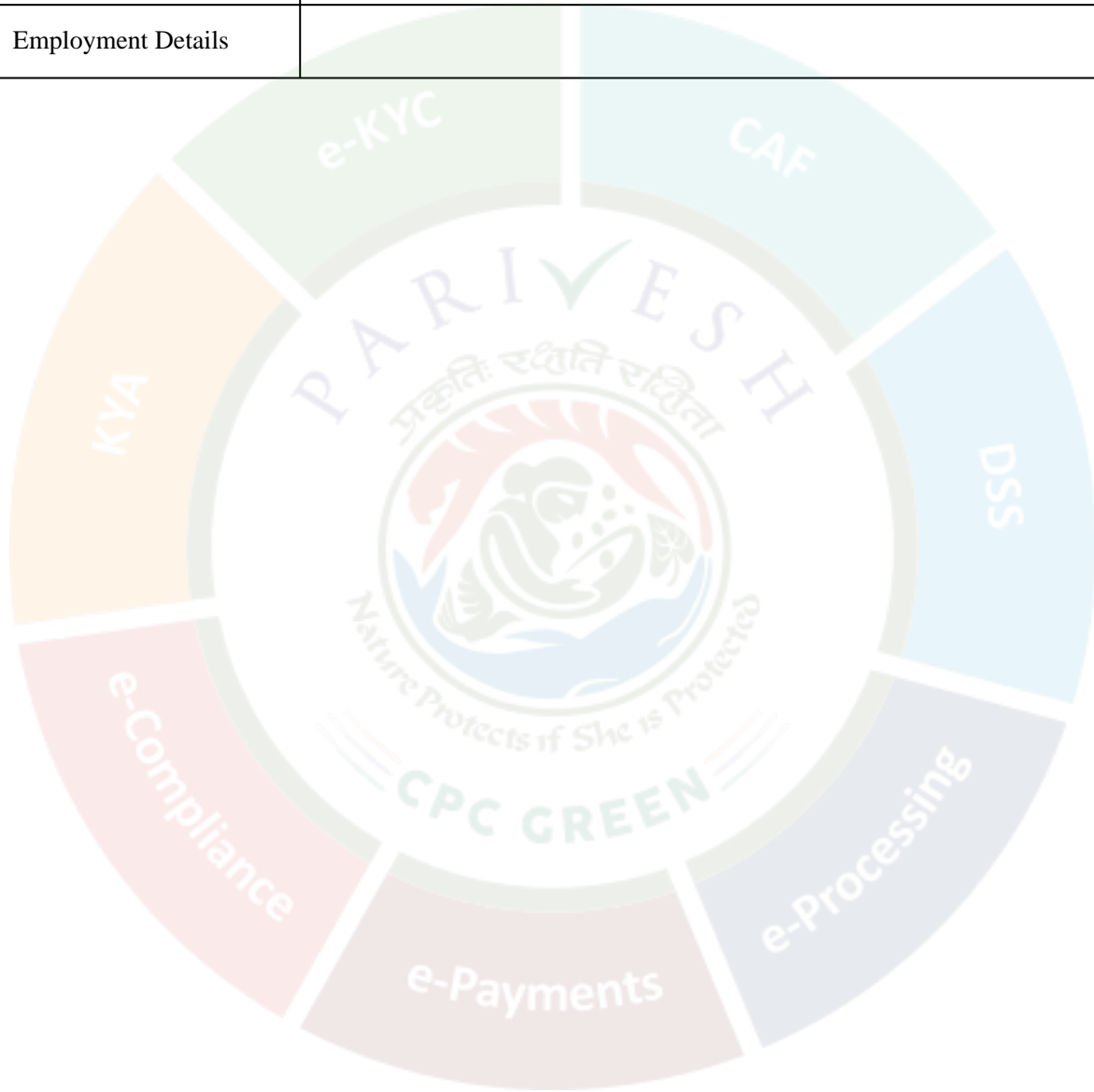
S. No	EC Conditions
	shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.
2.9	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at https://parivesh.nic.in/ . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.
2.10	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.
2.11	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.

Annexure 2

Details of the Project

S. No.	Particulars	Details	
a.	Details of the Project	Proposed Expansion of capacity from 67 KTPA to 80 KTPA at JL No. 85 &92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal by Graphite India Limited	
b.	Latitude and Longitude of the project site	23.488103986957,87.33182750220278 23.4928307421869,87.3418986857208	
c.	Land Requirement (in Ha) of the project or activity	Nature of Land involved	Area in Ha
		Non-Forest Land (A)	22.44
		Forest Land (B)	0
		Total Land (A+B)	22.44
d.	Date of Public Consultation	Public consultation for the project was held on	

S. No.	Particulars	Details
e.	Rehabilitation and Resettlement (R&R) involvement	NO
f.	Project Cost (in lacs)	42510
g.	EMP Cost (in lacs)	325
h.	Employment Details	



Details of Products & By-products

S. No	Unit	Product	Existing Quantity	Additional Quantity	Total Capacity after Expansion
1.	Extrusion-1	Graphite Electrodes	4.44*(3200 Mt/month)	12 MTPH	12 MTPH
2.	Extrusion -2		12 MTPH	-	12 MTPH
3.	Baking RH 14 Sec Furnace		42 MT/charge	-	42 MT/charge
4.	Baking RH 16 Sec Furnace		80 MT/charge	-	80 MT/charge
5.	Baking RH 24 Sec Furnace (I)		80 MT/charge	-	80 MT/charge
6.	Baking RH 24 Sec Furnace (II)		2775 MT/month	-	2775 MT/month
7.	Baking RH 24 Sec Furnace (III)		2775 MT/month	-	2775 MT/month
8.	Re-Baking Tunnel Kiln 1		3360 MT/month	469 MT/month	3829 MT/month
9.	Re-Baking Tunnel Kiln 2		3360 MT/month	469 MT/month	3829 MT/month
10.	Pitch Impregnation unit 2 & unit 3	Graphite Electrodes	6.9 MT/charge	-	6.9 MT/charge
11.	Pitch Impregnation unit 4		56924 MTPA	21868 MTPA	78792 MTPA
12.	Acheson		40 MT/charge	-	40 MT/charge
13.	Lengthwise Graphitization unit 3		25 MT/charge	-	25 MT/charge
14.	Lengthwise Graphitization unit 4		3180 MT/month	-	3180 MT/month
15.	Lengthwise Graphitization unit 5		2740 MT/month	796 MT/month	3536 MT/month

16.	Finishing Unit 1 & 2		420 MT/month	1084 MT/month	1504 MT/month
17.	Finishing Unit 3		2582 MT/month	-	2582 MT/month
18.	Finishing Unit 4		2582 MT/month	-	2582 MT/month

*4.44 MTPH in the existing capacity will be removed due to introduction of new technology in Extrusion 1, therefore only 12 MTPH will be final capacity after expansion.

Proposed Capacity is 80 KTPA

Finishing Unit 1 & 2 (MT/month) = 1504*12= 18048 MTPA

Finishing Unit 3(MT/month) = 2582*12 = 30984 MTPA

Finishing Unit 4 (MT/month) = 2582* 12 = 30984 MTPA

Total = ~80 KTPA of Graphite Electrodes

By-product details:

S No.	Unit	By-Product	Existing Quantity (in TPA)	Additional Quantity (in TPA)	Total capacity expansion (in TPA)
1.	Finishing Unit 1, & 2,3 and 4	Graphite Fines	12340	2414	14734
2.	Lengthwise Graphitization unit 3, 4 and 5, Finishing Unit 1, & 2,3 and 4 and Acheson	Graphite End cut Scrap	960	186	1146
		Graphite Electrode /Nipple scrap	180	35	215
3.	Acheson and Lengthwise Graphitization unit 3, 4 and 5	Graphite Burnt Spacer Scrap	970	188	1158
		Metcoke Residue Fines -35 (Demco fines)	10580	7510	18090
		Metcoke Residue Fines (Rejected)	3600	699	4299
4.	Baking RH 14 Sec 16 Sec, 24 Sec (I), 24 Sec (II) and 24 Sec (III) Furnace.	CPC Residue fines (From LWG & Coke fines from Macawber Pack media system)	610	118	728
		CPC Residue fines (RH +Baked Turning chips)	2880	559	3439

S No.	Unit	By-Product	Existing Quantity (in TPA)	Additional Quantity (in TPA)	Total capacity expansion (in TPA)
		ESP pitch (Coal Tar-Pitch from Waste Rec. System)	425	149.19	574.19
5.	Re-Baking Tunnel Kiln 1 and Re-Baking Tunnel Kiln 2	Pitch coke	1700	330	2030

Annexure-3

Details of capital and recurring cost of EMP:

S. No.	Description	Capital cost (in lakhs)	Entire plant Recurring cost /Annum (in lakhs)
1.	Air Pollution Control Devices (Proposed in Project)	75	201.83 (Operation and Maintenance cost of other Pollution control equipment)
2.	Water Pollution Management-Water Scrubber with ETP Extrusion-1 (Proposed in project)	250	47.89 (Operating cost of ETP-New Ext +PI4, ZLD and STP)
3.	Stack Monitoring, Ambient monitoring, Effluent Sampling, Noise Monitoring and work zone monitoring	-	13.9
4.	Green belt development	-	3.31
5.	Fugitive emissions control like road sweeping	-	15.47
6.	Rainwater harvesting	-	Negligible
	Total	325	282.4

Details of Extended EMP with proposed activities and budgetary allocation:

S No.	PROPOSED ACTIVITIES*	TOTAL BUDGET ALLOCATED (RS. IN LAKHS)
1.	Up gradation of Local School Infrastructure & Educational facilities- Provide Interactive smart class equipments /gadgets like desktop computers, projectors, installation of potable water facilities, renovation of classrooms, construction of toilets, development of playground, provision of scholarships, plantations etc.	44
2.	Construction and Maintenance of Nearby Roads & Drains	70
3.	Social Infrastructure Development- Installation of Solar Street Lights, Solar Lanterns, Construction of community toilets, Worship area & other infrastructure, Facility of potable drinking etc	78
4.	Skill development for youth and women- Organising Training programmes for youth/residents/women for sewing machines, handicrafts, painting etc., ITI training for civil, mechanical & electrical etc courses in Skill Development centre.	40
5.	Health Care facilities- Infrastructure development in local hospitals. PHCs like toilets, beds, potable water facilities, Strengthen the medical Centres by distributing medical equipments, Mobile ambulance van etc.	40
6.	Plantation- Plantation/ Avenue plantation along roadside, tree plantation & area development in nearby schools /colleges/ vacant land/ Panchayat bhavan, etc.	38
Total		310 lakhs

*The above proposed activities shall be completed within 3 years.

Existing Stack Emission Details

S. No.	Stack Attached to	Limits (mg/N m3)	No. of Stack	Height from Ground Level (m)	Internal Diameter (Top) (m)	Emission Rate				Exit Velocity (m/sec)	Exhaust Gas	
						(g/sec)					Temp (°C)	Volume Flow (Nm ³ /Hr)
						P M	S O ₂	N O _x	C O			
1.	Mixture Fume Extractor (North) (Extrusion #1 Dept)	PM-150	1	30	0.72	0.8	-	-	-	13.86	41	18780
2.	Mixture Fume Extractor (South) (Extrusion# 1 Dept)	PM-150	1	30	0.80	1.1	-	-	-	15.98	41	26732
3.	Cooler (North) (Extrusion# 1 Dept)	PM-150	1	30	0.55	0.7	-	-	-	19.52	34	15786
4.	Cooler South (Extrusion# 1 Dept)	PM-150	1	30	0.55	0.7	-	-	-	22	34	17791
5.	Fume Extractor (West side) weigh floor (Extrusion# 1 Dept)	PM-150	1	30	0.3352	0.2	-	-	-	16.26	40	4791
6.	Raymond Mill Dust Collector (Extrusion# 1 Dept)	PM-150	1	16	0.6	0.5	-	-	-	13.21	38	12550
7	Scrap System Dust Collector (Extrusion# 1 Dept)	PM-150	1	15	0.6	0.4	-	-	-	10.16	38	9652
8	Main Dust Collector (Extrusion# 1 Dept)	PM-150	1	22	0.7	0.4	-	-	-	7.62	39	9822
9	Ried Hammer Furnace (Baking Furnace)	PM-150 SO _x - NO _x -	1	30	0.8	0.8	1.4	1.7	<0.1	12.82	65.5	19893

	(14 SECTION)											
10	Ried Hammer Furnace (Baking Furnace)(R H16 & RH24-I SECTION) [RH-24(I) running]	PM-150 SOx- NOx-	1	45	1.8	4.7	7.8	9.4	<0.1	14.47	68.5	112674
11	P.I. UNIT-2 (THERMO PACK STACK)	PM-150 SOx- NOx-	1	30	0.4	0.2	0.3	0.3	<0.1	9.71	64.5	3778
12	P.I. UNIT-2 (HGG STACK)	PM-150 SOx- NOx-	1	30	0.4	0.2	0.4	0.4	<0.1	13.14	68.5	5053
13	Finishing Dust Collector (Unit 2)	PM-150	1	15	0.9	1.5	-	-	-	16.71	35	36067
14	FINE SCREENING DUST COLLECTOR	PM-150	1	15	0.812	1.1	-	-	-	15.6	34	27498
15	Boiler (1.5 Ton/ 2Ton) 1.5 Ton Running	PM-150 SOx- NOx-	1	29.29	0.28	0.8	1.9	2.3	<0.1	120.00	10.98	27190
16	Tunnel Kiln – 1 (Re-baking Furnace) (4.6 TPH)	PM-150 SOx- NOx-	1	30	0.73	0.5	0.8	1.0	<0.1	12.45	189	11786
17	Finishing Dust Collector (Unit 3)	PM-150	1	15	0.78	1.1				15.62	36	25241
18	P.I. Unit – 3 (HGG STACK)	PM-150 SOx- NOx-	1	30	0.4	0.2	0.3	0.4	<0.1	11.27	52.2	4551
19	Tunnel Kiln – 2 (Re-baking Furnace) (4.6 TPH)	PM-150 SOx- NOx-	1	30	0.73	0.5	0.8	0.9	<0.1	10.53	150	10888
20	P.I. Unit – 3 (THERMO PACK STACK)	PM-150 SOx- NOx-	1	30	0.4	0.2	0.3	0.4	<0.1	11.6	71	4428
21	Thermic Fluid	PM-150	1	30	0.58	0.3	0.5	0.6	<0.1	8.49	50	7257

	Heater (Extrusion - 2 Department)	SOx- NOx-										
22	Extrusion #2 IRICH Dust Collector	PM- 150	1	34	0.3	0. 1	-	-	-	8.32	33	2008
23	Extrusion #2 Main Dust Collector	PM- 150	1	34	1	1. 7	-	-	-	15.01	33	40259
24	Extrusion #2 Raymond Mill Dust Collector	PM- 150	1	15	0.23	0. 1	-	-	-	15.21	41	2103
25	Extrusion #2 Silo Dust Collector	PM- 150	1	15	0.6	0. 8	-	-	-	20.82	33	20103
26	Extrusion #2 IRICH (Trema) Scrubber System	PM- 150	1	15	0.28	0. 5	-	-	-	56.06	34	11750
27	Acheson Dust Collector	PM- 150	1	18	1.1	1. 8	-	-	-	13.25	38	42310
28	Extrusion #2 Scrap system Dust collector	PM- 150	1	17	0.65	0. 6	-	-	-	13.16	33	14913
29	R.H.-24 (II) Furnace	PM- 150 SOx- NOx-	1	45	1.6	2. 2	3. 7	4.4	<0 .1	8.84	77	53067
30	Finishing Unit – 3 (South Side) Nipple Dust Collector	PM- 150	1	15	0.7	0. 8	-	-	-	13.89	37	18019
31	Finishing Unit – 2 Nipple line Dust Collector	PM- 150	1	15	0.61	0. 9	-	-	-	20.83	34	20721
32	R.H.-16 Stock Cleaning Machine Dust Collector	PM- 150	1	15	1	0. 9	-	-	-	8.33	34	22269
33	R.H.-24 (II) Stock Cleaning	PM- 150	1	30	0.65	0. 3	-	-	-	7.23	35	8140

	Machine Dust Collector											
34	Turning-1 Dust Collector	PM-150	1	15	0.25	0.1	-	-	-	9.35	36	1552
35	P.I.-2 Turning Machine Dust Collector	PM-150	1	15	0.25	0.1	-	-	-	10.26	37	1698
36	P.I-3 Turning Machine Dust Collector	PM-150	1	15	0.25	0.1	-	-	-	10.22	35	1702
37	P.I Unit- 4 (THERMO PACK STACK)	PM-150 SOx-NOx-	1	30.5	0.95	0.7	1.2	1.5	<0.1	9.22	107	17972
38	P. I. - 4 Pre-Heater	PM-150 SOx-NOx-	1	35.8	1.15	1.0	1.7	2.1	<0.1	7.23	39	25152
39	RH-24 (II) Jaw Crusher Machine Dust Collector	PM-150	1	22	0.48	0.3	-	-	-	10.23	35	6281
40	Ried Hammer-16 Jaw Crusher Dust Collector	PM-150	1	15	0.8	0.7	-	-	-	9.32	34	15946
41	R.H.-24 (I) Stock Cleaning Dust Collector	PM-150	1	15	0.3	0.1	-	-	-	14.49	36	3464
42	Core Sampling Dust Collector	PM-150	1	15	0.25	0.1	-	-	-	11.03	34	1843
43	Carbon Baked Scrap (CBS) Dust Collector	PM-150	1	15	0.6	0.4	-	-	-	10.21	34	9826
44	Finishing - 4, Electrode Line Dust Collector Stack	PM-30	1	17.5	0.95	0.3	-	-	-	12.52	35	30109
45	Finishing - 4, Nipple Line Dust Collector Stack	PM-30	1	17.5	0.85	0.2	-	-	-	12.54	36	24065

46	RH-24 III, E.S.P Stack	PM-30	1	45	1.6	0.4	3.2	3.9	<0.1	7.6	72	46285
47	RH-24 III, Jaw Crusher Dust Collector	PM-30	1	22	0.6	0.1	-	-	-	8.32	33	8034
48	RH-24 III, Stock Cleaning Machine Dust Collector	PM-30	1	22	0.5	0.1	-	-	-	11.1	38	7323
Total						32.0	24.3	29.2				

Stacks after expansion

S. No.	Stack Attached to	Limits (mg/N m3)	No. of Stack	Height from Ground Level (m)	Internal Diameter (Top) (m)	Emission Rate (g/sec)				Exit Velocity (m/sec)	Exhaust Gas	
						P M	S O ₂	N O _x	C O		Temp (°C)	Volume Flow (Nm ³ /Hr)
1.	Extrusion #1 IRICH Dust Collector	PM-30	1	30	0.72	0.1	-	-	-	8.32	33	11568
2.	Extrusion #1 Main Dust Collector	PM-30	1	22	0.7	0.2	-	-	-	15.01	33	19727
3.	Extrusion #1 Raymond Mill Dust Collector	PM-30	1	16	0.6	0.1	-	-	-	15.21	41	14312
4.	Extrusion #1 Silo Dust Collector	PM-30	1	30	0.8	0.3	-	-	-	20.82	33	35739
5.	Extrusion #1 IRICH (Trema) Scrubber System	PM-30	1	30	0.55	0.4	-	-	-	56.06	34	45336
6.	Extrusion #1 Scrap system Dust collector	PM-30	1	15	0.6	0.1	-	-	-	13.16	33	12707
7	Thermic Fluid Heater (Extrusion - 1 Department)	PM-30	1	30	0.55	0.05	0.3	0.4	<0.1	8.49	50	6526
8	LWG#5 Metcoke	PM-150	1	15	0.3352	0.2	-	-	-	16.26	35	4868

	storage Bin Dust collection system Originally Fume Extractor (West side) weigh floor (Extrusion# 1 Dept)											
9	Ried Hammer Furnace (Baking Furnace) (14 SECTION)	PM- 150 SOx- NOx-	1	30	0.8	0. 8	1. 4	1.7	<0 .1	12.82	65. 5	19893
10	Ried Hammer Furnace (Baking Furnace)(R H16 & RH24-I SECTION) [RH-24(I) running]	PM- 150 SOx- NOx-	1	45	1.8	4. 7	7. 8	9.4	<0 .1	14.47	68. 5	112674
11	P.I. UNIT- 2 (THERMO PACK STACK)	PM- 150 SOx- NOx-	1	30	0.4	0. 2	0. 3	0.3	<0 .1	9.71	64. 5	3778
12	P.I. UNIT- 2 (HGG STACK)	PM- 150 SOx- NOx-	1	30	0.4	0. 2	0. 4	0.4	<0 .1	13.14	68. 5	5053
13	Finishing Dust Collector (Unit 2)	PM- 150	1	15	0.9	1. 5	-	-	-	16.71	35	36067
14	FINE SCREENIN G DUST COLLECT OR	PM- 150	1	15	0.812	1. 1				15.6	34	27498
15	Tunnel Kiln – 1 (Re- baking Furnace) (4.6 TPH)	PM- 150 SOx- NOx-	1	30	0.73	0. 5	0. 8	1.0	<0 .1	12.45	189	11786
16	Finishing Dust Collector (Unit 3)	PM- 150	1	15	0.78	1. 1	-	-	-	15.62	36	25241
17	P.I. Unit – 3 (HGG STACK)	PM- 150 SOx- NOx-	1	30	0.4	0. 2	0. 3	0.4	<0 .1	11.27	52. 2	4551

18	Tunnel Kiln – 2 (Re-baking Furnace) (4.6 TPH)	PM-150 SOx- NOx-	1	30	0.73	0.5	0.8	0.9	<0.1	10.53	150	10888
19	P.I. Unit – 3 (THERMO PACK STACK)	PM-150 SOx- NOx-	1	30	0.4	0.2	0.3	0.4	<0.1	11.6	71	4428
20	Thermic Fluid Heater (Extrusion - 2 Department)	PM-150 SOx- NOx-	1	30	0.58	0.3	0.5	0.6	<0.1	8.49	50	7257
21	Extrusion #2 IRICH Dust Collector	PM-150	1	34	0.3	0.1	0.5	0.6	<0.1	8.32	33	2008
22	Extrusion #2 Main Dust Collector	PM-150	1	34	1	1.7	-	-	-	15.01	33	40259
23	Extrusion #2 Raymond Mill Dust Collector	PM-150	1	15	0.23	0.1	-	-	-	15.21	41	2103
24	Extrusion #2 Silo Dust Collector	PM-150	1	15	0.6	0.8	-	-	-	20.82	33	20103
25	Extrusion #2 IRICH (Trema) Scrubber System	PM-150	1	15	0.28	0.5	-	-	-	56.06	34	11750
26	Acheson Dust Collector	PM-150	1	18	1.1	1.8	-	-	-	13.25	38	42310
27	Extrusion #2 Scrap system Dust collector	PM-150	1	17	0.65	0.6	-	-	-	13.16	33	14913
28	R.H.-24 (II) Furnace	PM-150 SOx- NOx-	1	45	1.6	2.2	3.7	4.4	<0.1	8.84	77	53067
29	Finishing Unit – 3 (South Side) Nipple Dust Collector	PM-150	1	15	0.7	0.8	-	-	-	13.89	37	18019
30	Finishing Unit – 2 Nipple line Dust Collector	PM-150	1	15	0.61	0.9	-	-	-	20.83	34	20721

31	R.H.-16 Stock Cleaning Machine Dust Collector	PM- 150	1	15	1	0. 9	-	-	-	8.33	34	22269
32	R.H.-24 (II) Stock Cleaning Machine Dust Collector	PM- 150	1	30	0.65	0. 3	-	-	-	7.23	35	8140
33	Turning-1 Dust Collector	PM- 150	1	15	0.25	0. 1	-	-	-	9.35	36	1552
34	P.I.-2 Turning Machine Dust Collector	PM- 150	1	15	0.25	0. 1	-	-	-	10.26	37	1698
35	P.I-3 Turning Machine Dust Collector	PM- 150	1	15	0.25	0. 1	-	-	-	10.22	35	1702
36	P.I Unit- 4 (THERMO PACK STACK)	PM- 150 SOx- NOx-	1	30.5	0.95	0. 7	1. 2	1.5	<0 .1	9.22	107	17972
37	P. I. - 4 Pre- Heater	PM- 150 SOx- NOx-	1	35.8	1.15	1. 0	1. 7	2.1	<0 .1	7.23	39	25152
38	RH-24 (II) Jaw Crusher Machine Dust Collector	PM- 150	1	22	0.48	0. 3	-	-	-	10.23	35	6281
39	Ried Hammer-16 Jaw Crusher Dust Collector	PM- 150	1	15	0.8	0. 7	-	-	-	9.32	34	15946
40	R.H.-24 (I) Stock Cleaning Dust Collector	PM- 150	1	15	0.3	0. 1	-	-	-	14.49	36	3464
41	Core Sampling Dust Collector	PM- 150	1	15	0.25	0. 1	-	-	-	11.03	34	1843
42	Carbon Baked Scrap (CBS) Dust Collector	PM- 150	1	15	0.6	0. 4	-	-	-	10.21	34	9826

43	Finishing - 4, Electrode Line Dust Collector Stack	PM-30	1	17.5	0.95	0. 3	-	-	-	12.52	35	30109
44	Finishing - 4, Nipple Line Dust Collector Stack	PM-30	1	17.5	0.85	0. 2	-	-	-	12.54	36	24065
45	RH-24 III, E.S.P Stack	PM-30	1	45	1.6	0. 4	3. 2	3.9	<0 .1	7.6	72	46285
46	RH-24 III, Jaw Crusher Dust Collector	PM-30	1	22	0.6	0. 1	-	-	-	8.32	33	8034
47	RH-24 III, Stock Cleaning Machine Dust Collector	PM-30	1	22	0.5	0. 1	-	-	-	11.1	38	7323
						27	22	27.				
						.8	.7	3				
<i>*Boiler facility will be dismantled post expansion</i>												



HALF-YEARLY COMPLIANCE REPORT OF GRAPHITE INDIA LIMITED

Project Details	
Name of Company	M/s Graphite India Limited
Project Name	Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes
Location	JL No. 85 & 92, Village Sagarbhanga, Durgapur, Dist. Paschim Bardhaman, West Bengal - 713211
EC Identification No.	EC25B2301WB5490851N
EC File No.	IA-J-11011/250/2025-IA-II
EC Issue Date	26 th December, 2025
Issued by	Ministry of Environment, Forest and Climate Change (MoEF&CC), New Delhi
Category / Sector	Category B1 / Industrial Projects - 2 [Schedule 5(e)] appraised as Category A as it falls in SPA.
Reporting Period	October,2025 to March,2026

1. Petroleum Products and Petrochemical Based Processing

Specific EC Conditions for (Petroleum Products and Petrochemical Based Processing Such as Production of Carbon Black and Electrode Grade Graphite (Processes Other Than Cracking))		
S No.	EC Compliance Conditions	Compliance Status
1.1	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry (Annexure - 3). All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.	All environmental protection measures, pollution control systems, environmental monitoring programmes, and risk mitigation measures proposed in the EIA/EMP are being implemented in a phased manner. The Environmental Management Plan (EMP) is under implementation, and adequate budgetary provisions have been earmarked for environmental management and pollution control measures. The capital expenditure towards the Effluent Treatment Plant (ETP) and other pollution control systems is currently under the procurement stage and will be incurred upon finalization and installation of the equipment. The corresponding recurring expenditure for operation and maintenance of these facilities will commence after the commissioning of the respective pollution control equipment.
1.2	The project proponent shall prepare a site-specific conservation plan and wildlife management plan in case of the presence of Schedule-I species in the study area, as applicable to the project, and submit to Chief	A Conservation Plan for Schedule-I species was initially prepared and submitted to the Divisional Forest Officer (DFO), Durgapur, on 03.07.2025. The plan is currently under process with the concerned authority. The company will implement

	Wildlife Warden for approval. The recommendations shall be implemented in consultation with the State Forest/Wildlife Department in a time bound manner.	the recommendations in consultation with the State Forest/Wildlife Department as and when approved. Copy of the Conservation Plan has been attached herewith as Annexure-1
1.3	The total fresh water requirement after expansion shall not exceed 843 KLD, which shall be met from Durgapur Projects Limited. Existing effluent generation is 284 CMD which is treated through ETP 1 & 2 of capacity 168 CMD and WWTP (cooling water filter) of capacity 1440 CMD. Proposed effluent generation shall be 200 CMD which shall be treated through existing ETP and WWTP (cooling water filter) as well as proposed ETP of capacity 300 CMD. Domestic wastewater shall be treated in the STPs installed (10 & 20 KLD). The plant will operate on a Zero Liquid Discharge (ZLD) system, and treated effluent shall not be discharged outside the factory premises.	Fresh water is being sourced from Durgapur Projects Limited as per Agreement No. WW/14-N-I/Graphite/91/30 dated 22nd June, 1990. Present water consumption is well within 843 KLD limit. Bi-monthly bills have been attached as Annexure-2 . Existing ETP 1 & 2 (capacity 168 CMD) and WWTP cooling water filter (capacity 1440 CMD) are operational. Photographs of the existing ETPs have been attached as Annexure-3 . The procurement process for the proposed 300 KLD Effluent Treatment Plant (ETP) is currently underway. Zero effluent Discharge (ZLD) is being strictly maintained and no treated effluent is discharged outside the factory premises. STP of 10 KLD and 20 KLD capacity are operational for domestic wastewater treatment.
1.4	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond	Process effluent and wastewater are completely segregated from storm water through dedicated drainage networks. Storm water drains are provided throughout the plant premises. Regular monitoring of drainage systems is being carried out ensuring no effluent is mixed with storm water. Photographs of the same have been attached as Annexure-4
1.5	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.	All hazardous chemicals if any are stored in designated drums, barrels, and containers as per applicable safety norms.
1.6	Process organic residue and spent carbon, if any, shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF.	Process organic residue is not generated. ETP Sludge is being disposed off to authorized CHWTSDF. Copy of the authorization has been attached as Annexure-5 .
1.7	Regular VOC monitoring shall be done at vulnerable points. A Leak Detection and Repair (LDAR) Standard Operating Procedure (SOP) shall be strictly enforced.	VOC monitoring is being carried out regularly at all identified vulnerable points within the plant premises. A Leak Detection and Repair (LDAR) Standard Operating Procedure (SOP) has been established and is being strictly enforced. Details of LDAR is attached as Annexure-6 . VOC monitoring report has been attached as Annexure-7
1.8	The oily sludge shall be subjected to melting pit for oil recovery and the residue shall be	Not Applicable. Oily sludge generated is handled as per approved

	bioremediated. The sludge shall be stored in HDPE lined pit with proper leachate collection system	hazardous waste management procedures and disposed to CHWTSDF and authorized recyclers. Copy of the authorization has been attached as Annexure-5
1.9	Oil catchers/oil traps shall be provided at all possible locations in rain/ storm water drainage system inside the factory premises	Oil catchers and oil traps have been provided at all possible locations in the rain/storm water drainage system within the plant premises. These are maintained periodically to ensure their effective functioning. Photographs of the same has been attached as Annexure-8
1.10	The company shall undertake waste minimization measures as below: (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapour recovery system. (f) Use of high-pressure hoses for equipment cleaning etc. to reduce wastewater generation.	(a) Metering and control of active ingredients is being followed to minimize waste generation. (b) As applicable, minor part of the by-products are being reused and most of them such as Graphite fines, Graphite end cut scrap, Graphite Burnt Spacer Scrap, Graphite Electrode /Nipple scrap, CPC Residue fines, Pitch coke and Met coke Residue Fines are sold to Industries & Carbon traders. (c) Automated filling systems are in use to minimize spillage wherever applicable. (d) Not applicable (e) Not applicable (f) Not applicable
1.11	Greenbelt of 5-10 m greenbelt has been developed in an area 6.52 ha within the plant. Further, greenbelt of 1.3 ha was developed in the colony nearby making total area of 7.82 ha i.e., 34.87% of the total area of the project. An additional greenbelt of 1.156 ha shall be developed as avenue plantation due to space constraint inside the plant premises making total greenbelt of 8.976 has i.e 40% total project area. The company has obtained permission from Asansol Durgapur Development Authority vide memo no. ADDA/DGP/PC-56/25-26(60) dated 24/06/2025 for development avenue plantation along roadside of two patch of land which shall maintained by the project proponent till the life of the industry. Indigenous species shall only be planted as part of greenbelt and non-indigenous / alien species shall be replaced with native species. No invasive or alien or non-native tree species shall be selected for plantation. PP shall plant	Existing greenbelt of 7.82 ha (34.87%) has been maintained. Additional avenue plantation is being undertaken to achieve total greenbelt coverage of 8.976 ha (40% of total project area). Photographs of the same has been attached as Annexure-9 . Plant species are being planted in consultation with local administration. Trees are being/ will be planted under the #Plant4Mother (#एक पेड़ माँ के नाम) campaign and will be uploaded on the MeriLiFE portal (https://merilife.nic.in/). Records of tree canopy will be monitored as per requirement after substantial development of trees.

	at least 20 variety of species as a part of greenbelt. Saplings 4-6 feet high shall be planted. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department and native species shall be developed. Records of tree canopy shall be monitored through remote sensing map. Trees shall be planted in the Green Belt under the campaign #Plant4Mother #एक पेड़ माँ के नाम and uploaded on the MeriLiFE portal (https://merilife.nic.in/).	
1.12	PP proposed to allocate Rs. 3.10 Crores towards extended EMP which shall be spent as submitted as per action plan (Annexure - 4) within 3 years in consultation with District Administration. All the commitments made in Public Hearing shall be completed within the timeline as per action plan submitted.	Implementation of the Extended Environmental Management Plan (EMP) for the proposed project is scheduled to commence from FY 2026–27 in consultation with the District Administration, as per the approved action plan. The budgeted expenditure towards the Extended EMP shall be incurred in a phased manner during the implementation period. The commitments and the progress of implementation will be reported in subsequent compliance reports.
1.13	A separate Environmental Management Cell (having qualified person with Environmental Science/ Environmental Engineering/ specialization in the project area) equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions	A dedicated Environmental Management Cell is already functioning for environmental monitoring, compliance management and implementation of environmental safeguards.
1.14	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms	Comprehensive fire protection systems are installed throughout the plant in accordance with applicable norms and standards. Fire hydrant network, portable fire extinguishers, fire detection and alarm systems are operational across all process areas. Regular mock drills and fire safety training are conducted for all plant personnel. Photographs of the same has been attached as Annexure-10
1.15	All the existing and proposed stacks shall not exceed the emission limits prescribed in the tables mentioned at Annexure - 5. Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server	All operating stacks are provided with appropriate air pollution control systems. Online Stack Monitoring System are installed as applicable as per last EC and connected to CPCB/WBPCB servers. Emission levels are maintained within prescribed standards. Existing Online Continuous Stack Emission Data has been attached as Annexure-11 and proposed stacks are under procurement and construction phase.

1.16	<p>Industry shall allocate at least Rs. 0.50 Crore for Occupational Health Safety for establishing occupational health Centre for surveillance of the worker's health within the plant on a regular basis. The health data shall be used in deploying the duties of the workers. All workers & employees shall be provided with required safety kits/mask for personal protection.</p>	<p>An Occupational Health Centre (OHC) is operational within the plant premises with a qualified medical professional for regular health surveillance of workers. Periodic health check-ups including lung function tests, audiometry, and general health examinations are being conducted for all workers. All workers and employees are provided with required personal protective equipment (PPE) including safety kits, masks, helmets, gloves, ear muffs, safety shoes etc. as applicable to their work areas. Photographs of the Occupational health centre and PPEs have been attached as Annexure-12</p>
1.17	<p>The National Emission Standards for Petrochemical (Basic & Intermediates) issued by the Ministry vide G.S.R. 820 (E) dated 9th November, 2012 as amended time to time shall be followed.</p>	<p>The National Emission Standards for Petrochemicals (Basic & Intermediates) as notified under G.S.R. 820(E) dated 9th November, 2012 and as amended from time to time are being strictly followed. Stack emission monitoring results confirm that all emissions are within the prescribed national standards. Existing Online Continuous Stack Emission Data has been attached as Annexure-11.</p>
1.18	<p>Recommendations of mitigation measures from possible accident shall be implemented based on advanced risk Assessment studies conducted for worst case scenarios using latest techniques.</p>	<p>A comprehensive Risk Assessment study has been carried out for the plant considering worst case scenarios using advanced techniques. All recommended mitigation measures from the risk assessment have been implemented including installation of safety interlocks, emergency shutdown systems, and safety instrumented systems. On-site Emergency Plan and Off-site Emergency Plan are in place and are rehearsed periodically through mock drills. Copies of the same are enclosed as Annexure-13.</p>
1.19	<p>PP shall sensitize and create awareness among the people working within the project area as well as its surrounding area on the ban of Single Use Plastic in order to ensure the compliance of Notification published by MOEFCC on 12th August, 2021. A report along with photographs on the measures taken shall also be included in the six-monthly compliance report being submitted to concerned authority.</p>	<p>Awareness measures have been undertaken to sensitize employees, contract workers, and the surrounding community regarding the ban on Single Use Plastic (SUP) in accordance with the MoEF&CC Notification dated 12th August, 2021. Posters highlighting the ban on SUP have been displayed at two prominent locations outside the plant gate to create awareness among people within the project area as well as the surrounding area.</p> <p>Being an ISO 9001, ISO 14001, ISO 45001, and ISO 50001 certified organization, the Company's internal management systems and procedures also prohibit the use of Single Use Plastic within its</p>

		operations. The status of compliance is supported with relevant photographs and documentary evidence enclosed as Annexure-14 .
1.20	The project proponent shall ensure the compliance of the Ministry's OM dated 14th January 2025 w.r.t. streamlining the implementation of Notifications G.S.R. 702 and G.S.R. 703 dated 12 th November 2024	The company has taken note of the Ministry's OM dated 14th January, 2025 regarding implementation of Notifications G.S.R. 702 and G.S.R. 703 dated 12th November, 2024. Necessary steps are being taken to ensure compliance with the said notifications and the OM.
1.21	The plantation under Green Credit Program by the Project Proponent shall not be eligible for site specific plantation clearance forming part of Environment Clearance	The Company acknowledges that plantation activities undertaken under the Green Credit Programme has not been considered towards compliance with the greenbelt and plantation obligations stipulated under the Environmental Clearance.
2.	General Conditions	
2.1	No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	The company confirms that no further expansion or modification beyond the scope approved under the present Environmental Clearance is being undertaken or planned without prior approval of MoEF&CC/SEIAA. In case of any future deviation or alteration from the approved proposal, a fresh reference will be made to the Ministry/SEIAA as applicable.
2.2	The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.	LED-based lighting has been installed across the plant premises including production areas, offices, roads, and other common areas. Progressive replacement of conventional lighting with LED fixtures is being carried out as part of the energy efficiency programme.
2.3	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under the Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Noise control measures including acoustic enclosures, silencers, and anti-vibration mounts are installed on all major noise-generating equipment. Ambient noise monitoring has been carried inside plant and plant boundaries. Noise monitoring results for the reporting period are enclosed with this report as Annexure-15 .
2.4	The company shall undertake all relevant	Implementation of the Extended Environmental

	measures for improving the socio-economic conditions of the surrounding area. Extended EMP activities shall be undertaken by involving local villages and administration and shall be implemented. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Management Plan (EMP) for the proposed project is scheduled to commence from FY 2026–27 in consultation with the District Administration. An amount of Rs. 3.10 Crores has been earmarked towards the Extended EMP, which shall be implemented in a phased manner over a period of three years and the progress of implementation shall be reported in subsequent compliance reports.
2.5	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/ pollution control measures shall not be diverted for any other purpose.	Dedicated funds have been earmarked for environmental management as follows: - Capital Cost for EMP: Rs. 325 Lakhs - Extended EMP Budget: Rs. 310 Lakhs (over 3 years) Recurring cost has not been incurred as the project is in implementation stage. These funds are being/will be utilized for environmental management and pollution control purposes.
2.6	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zila Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal.	A copy of the Environmental Clearance letter has been sent to the following authorities: - Concerned Gram Panchayat - Zila Parishad, Paschim Bardhaman - Urban Local Body, Durgapur - Relevant local NGOs Acknowledgement copies are available for verification as Annexure-16
2.7	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six-monthly compliance status report shall be posted on the website of the company.	Noted and complied. The Environmental Clearance already posted and compliance status reports will be posted on the company website: www.graphiteindia.com
2.8	The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance	The Environmental Statement in Form-V for the financial year ending 31st March is being submitted annually to the West Bengal Pollution Control Board (WBPCB) as mandated under the Environment (Protection) Rules, 1986. Copy of the acknowledgement receipt of Form-V and form V has been attached as Annexure-17 . The Form-V statement along with the EC compliance status will be uploaded on the company website.

	conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail	
2.9	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry and at https://parivesh.nic.in/ . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry	Public notice regarding grant of Environmental Clearance has been published in two local newspapers – one in English and one in the local vernacular language (Bengali) – within seven days of the issue of the EC letter dated 26/12/2025. Copies of the published public notices are enclosed with this compliance report as Annexure-18 .
2.10	The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.	The Project Proponent has obtained the requisite Consent to Establish (CTE) from the West Bengal Pollution Control Board for Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes at JL No. 85 & 92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal (Annexure-19), wherein the details of the project and its implementation status will be duly disclosed after obtaining CTO.
2.11	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.	Noted.

REVISED WILDLIFE CONSERVATION PLAN

OF SCHEDULE-I SPECIES FOUND IN 10 KM RADIUS
OF PLANT SITE

**Proposed Expansion of capacity
from 67 KTPA to 80 KTPA
Graphite Electrodes**

At

**JL No. 85 & 92, Village: Sagarbhanga, Durgapur,
District: Paschim Bardhaman, West Bengal**

[under clause 7(ii) of EIA Notification 2006 amended from time to time]

APPLICANT



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EIA CONSULTANT



J.M. EnviroNet Pvt. Ltd.

(Registered EIA Consultant Organization from NABET-QCI)

Certificate No.: NABET/EIA/2326/RA 0308, Valid Till 07.08.2026,

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UNDERTAKING FROM THE EXPERT

I, Akshay Singh (Retd. IFS and QCI- NABET Accredited FAE (Ecology & Biodiversity), certify that the report titled “Wildlife Conservation and Management Plan of Schedule-I Species for **“Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes At JL No. 85 & 92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal by Graphite India Limited”** has been prepared by myself and my team in line with the standard operating procedures and protocols for scientific analysis & reporting. The data presented is a collation of primary and secondary information and has been thoroughly verified for authenticity. The report highlights pertinent information and data in the functional areas of ecology and biodiversity crucial for the decision on Environmental Clearance by the competent statutory authorities.



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EXECUTIVE SUMMARY

- M/s Graphite India Limited is currently operating at a capacity of 67 KTPA. Now M/s. Graphite India Limited is applying for Expansion of Capacity from 67 KTPA to 80 KTPA at the same location under MOEFCC's O.M. dated 11th April., 2022 regarding grant of Environmental Clearance under para 7(ii)a of EIA notification, 2006
- The Plant area is 55.45 Acres (22.44 Hectares) and the proposed expansion is planned within the existing GIL premises, located at JL no 85 and JL no 92, at Sagarbhanga Village, Durgapur Tehsil, Paschim Bardhaman District, and West Bengal.
- As per EIA Notification dated 14thSept., 2006, as amended from time to time; the project falls under S. No.5 (Manufacturing/Fabrication), Category "B1", Project or Activity '5(e)'-Petroleum products and petrochemical based processing such as production of carbon black and electrode grade graphite (processes other than cracking & reformation and not covered under the complexes). The project will be appraised as Category "A" because the plant site falls in Severely Polluted Area.
- Existing greenbelt is 34.87 % and it will be developed as 40 % in order to meet the statutory requirement.
- No National Parks, Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves are present within 10 km radius of the plant site. There are no notified Elephant Corridors within the 10 km radius of the plant area, as per the MoEF&CC, Elephant Corridors Report- 2023, Government of India. However, elephant movement has been reported/observed within the 10 km radius of the plant area. However, there is presence of Durgapur PF (~4.8 km in North East Direction from plant site) and Beliatore RF (~9.0 km in South West direction from plant site)
- Presence of water bodies-Kunur Nala (~8.5 km in NNE direction from Plant site), Tamla Nala (~5.0 km in NW direction from Plant site), Damodar River (~2.5 km in SSW direction from Plant site), Barjora Nala (~5.30 km in WSW direction from Plant site) and Tartari Nala (~8.20 km in WSW direction from Plant site), DVC Canal (~0.5 km in South) and Damodar Branch Canal (~6.0 km in East).
- The Wildlife (Protection) Amendment Act, 2022 dated 19th Dec., 2022 which came into force from 1st April, 2023 as per the MoEF&CC Notification vide S.O. 1394(E) dated 22nd March 2023, there are sixteen listed faunal species present within 10 km radius study area, are now classified as Schedule – I species: **Bengal Fox (*Vulpes bengalensis*)**, **Small Indian Civet (*Viverricula indica*)**, **Golden Jackal (*Canis aureus*)**, **Indian Grey Wolf (*Canis lupus pallipes*)**, **Jungle cat (*Felis chaus*)**, **Indian Grey Mongoose (*Urva edwardsii*)**, **Striped Hyaena (*Hyaena hyaena*)**, **Asian Elephant (*Elephas maximus*)**, **Dhaman or Common Rat Snake (*Ptyas mucosus*)**, **Checkered keelback (*Fowlea piscator*)**, **Russell's viper (*Daboia russelii*)**, **Yellow or Golden Monitor Lizard (*Varanus flavescens*)**, **Monocled cobra (*Naja kaouthia*)**, **Cotton Teal or Cotton Pygmy Goose**

(Nettapus coromandelianus), , Peacock or India Peafowl (*Pavo cristatus*) and Shikra (*Accipter badius*).

- **Total Cost of the expansion project-Rs. 315 crores**

Cost for Environment Management Plan-

- Capital Cost: Rs. 325 lakhs
- Recurring Cost: Rs 282.4 lakhs/annum
- Measures taken by Company for Conservation of wildlife- Flora and Fauna stands as a testament to our unwavering dedication to the preservation of biodiversity. By implementing comprehensive strategies that encompass the protection of both flora and fauna, we strive not only to safeguard endangered species and delicate ecosystems but also to inspire a global commitment to environmental stewardship.

CHAPTER 1-INTRODUCTION

i. BRIEF NOTE ABOUT THE PROJECT AND ITS UTILITY

M/s Graphite India is currently operating at a capacity of 67 KTPA.

This report has been prepared in reference to the Ministry's O.M. dated 11th April, 2022 regarding grant of EC under para 7(ii) of EIA Notification, 2006, amended from time to time for which EIA/EMP Report has been prepared as per Standard TOR Points for carrying out the Environmental Impact Assessment (EIA) study for "Proposed Expansion of capacity from 67 KTPA to 80 KTPA at JL No. 85 & 92, Village: Sagarbhangra, Durgapur, District: Paschim Bardhaman, West Bengal" by M/s. Graphite India Limited.

The main purpose of this report is to provide a coherent statement after analysing all significant impact of the proposed Expansion in capacity within the existing land and also the measures that should be taken to eliminate and mitigate the impacts. The report broadly contains essential information of:

- ❖ The proponent to implement the proposal in an environmentally and socially responsible way;
- ❖ The responsible authority to make an informed decision on the proposal, including the terms and conditions that must be attached to an approval or authorization.

ii. IDENTIFICATION OF THE PROJECT AND THE PROJECT PROPONENT.

GIL's operational strength is significantly bolstered by its efficient global partnerships and the strategic location of its manufacturing facilities. These facilities are situated close to both inland customers and major seaports, enabling GIL to guarantee timely deliveries and maintain a robust supply chain. This logistical advantage has been instrumental in solidifying GIL's reputation.

Over decades of dedicated operation, GIL has successfully cultivated a strong and reputable brand presence in the global market. The company's corporate philosophy is deeply rooted in an unwavering commitment to delivering consistent quality across all its products and services. This dedication has resulted in an enviable track record within the industry, underscoring its reliability and excellence.

Today, Graphite India Limited boasts a significant international footprint, positioning itself among the top-tier electrode manufacturing companies worldwide. This leadership is attributed not only to its impressive production capacity but also to its strong customer relationships and a reputation for impeccable quality and service. Further reinforcing its commitment to excellence and responsible practices, GIL is ISO 9001, ISO14001, ISO 45001, ISO 50001, SA 8000 certified and actively implements eco-friendly manufacturing processes. Currently, the plant has a capacity of 67 KTPA in the land area of 55.45 acres.

Now M/s. Graphite India Limited is submitting an application for Expansion of Capacity from 67 KTPA to 80 KTPA at the same location under MOEFCC's O.M. dated 11th April., 2022 regarding grant of Environmental Clearance under para 7(ii)a of EIA notification, 2006.

iii. **BRIEF DESCRIPTION OF NATURE OF THE PROJECT**

Graphite India Limited has proposed “Expansion of Capacity from 67 KTPA to 80 KTPA at the same location under MOEFCC’s O.M. dated 11th April., 2022 regarding grant of Environmental Clearance under para 7(ii)a of EIA notification, At JL No. 85 &92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal.

iv. **PROJECT DESCRIPTION**

(i) **Type of Project including interlinked and independent projects, if any.**

There are no interlinked projects related to this plant

Table 1: Details of the Project

S. No.	PARTICULARS	DETAILS
A.	Nature & Size of the Project	Graphite India Limited is proposing Expansion of capacity from 67 KTPA to 80 KTPA at JL No. 85 &92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal.
B.	Category of the Project	Category “B1”, Project or Activity 5(e)’
C.	Location Details	
	Plot No.	JL No.85 and 92
	Village	Sagarbhanga
	Tehsil	Durgapur
	District	Paschim Bardhaman
	State	West Bengal
	Latitude	Lat-23°29’17.18’’N-23°29’34.17’’N
	Longitude	87°19’54.58’’E-87°20’24.55’’E
	Toposheet No.	Core Zone- F45D7_73M7 Buffer Zone-F45D2_73M2, F45D3_73M3, F45D6_73M6 & F45D7_73M7
D.	Area Details	
	Total Plant Area	55.45 acres (22.44 hectares)
	Greenbelt & Plantation Area	Out of the total plant area (22.44 ha), 34.87 % area has already been developed. The same will be maintained and according to the statutory requirement, it will be developed as 40 % in avenue plantation.
E.	10 km radius Environmental Setting Details (with approximate aerial distance & direction from plant site)	
1.	Nearest Town & City	Durgapur (~1.5 km in West direction)
2.	Nearest National/ State Highway	NH-19 (~1.7 Km in North East direction from plant site) SH-9 (~0.5 km in North Direction from plant site)
3.	Nearest Railway station	Durgapur Railway Station (~1.3 km in West direction from plant site)
4.	Nearest Airport	Kazi Nazrul Islam Airport (~16.8 km in NNW direction from plant site)
5.	National Parks, Wildlife Sanctuaries, Reserved Forests (RF)/ Protected Forests (PF), Biosphere	Durgapur PF (~4.8 km in North East Direction from plant site) Beliatore RF (~9.0 km in South West direction from plant site) There are no notified Elephant Corridors within the 10 km radius of

	Reserves, Tiger/ Elephant Reserves, Wildlife Corridors etc. within 10 km radius	the plant area, as per the MoEF&CC, Elephant Corridors Report-2023, Government of India. However, elephant movement has been reported/observed within the 10 km radius of the plant area.			
6.	Water Body (within 10 km radius)	<ul style="list-style-type: none"> • Kunur Nala (~8.5 km in NNE direction from Plant site) • Tamla Nala (~5.0 km in NW direction from Plant site) • Damodar River (~2.5 km in SSW direction from Plant site) • Barjora Nala (~5.30 km in WSW direction from Plant site) • Tartari Nala (~8.20 km in WSW direction from Plant site) • DVC Canal (~0.5 km in South) • Damodar Branch Canal (~6.0 km in East) 			
7.	Seismic Zone	Zone - III [as per IS 1893 (Part-I): 2002] i.e., Moderate Seismic Intensity			
F.	Cost Details				
	Total Cost of the Expansion Project	Rs. 315 crores			
	Cost for Environment Management Plan	Capital Cost: Rs. 325 lakhs Recurring Cost: Rs 282.4 lakhs			
G.	Basic Requirements for the project	Existing Requirement (KLD)	For expansion (KLD)	Total after Expansion (KLD)	
	Freshwater Requirement (KLD)	900	843	843 (Reduction of 57 KLD)	
	Source: Durgapur Projects Limited				
	Power Requirement (MW)	65 MVA	-	65 MVA	
	Source: Damodar Valley Corporation				
	Man-Power Requirement	Construction Phase			
		Contractual	150	0	150
		Operation Phase			
		Regular	876	0	876
		Contractual	850	0	850
Source: Unskilled/Semi-Skilled- local area: Skilled-local/outside					
H.	Products	Graphite Electrodes			
I.	Working Days	365 days			

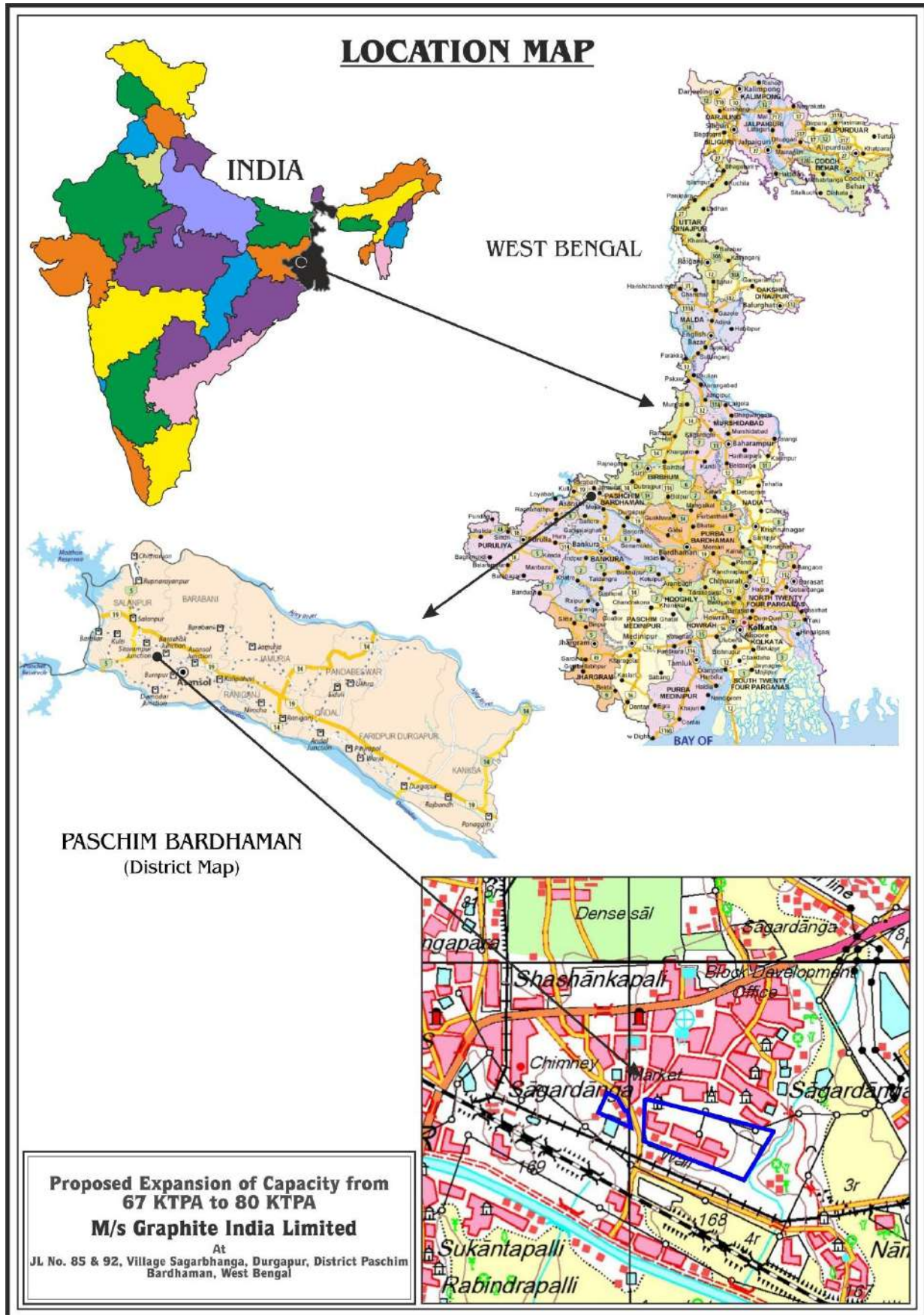


Figure 1: Location Map

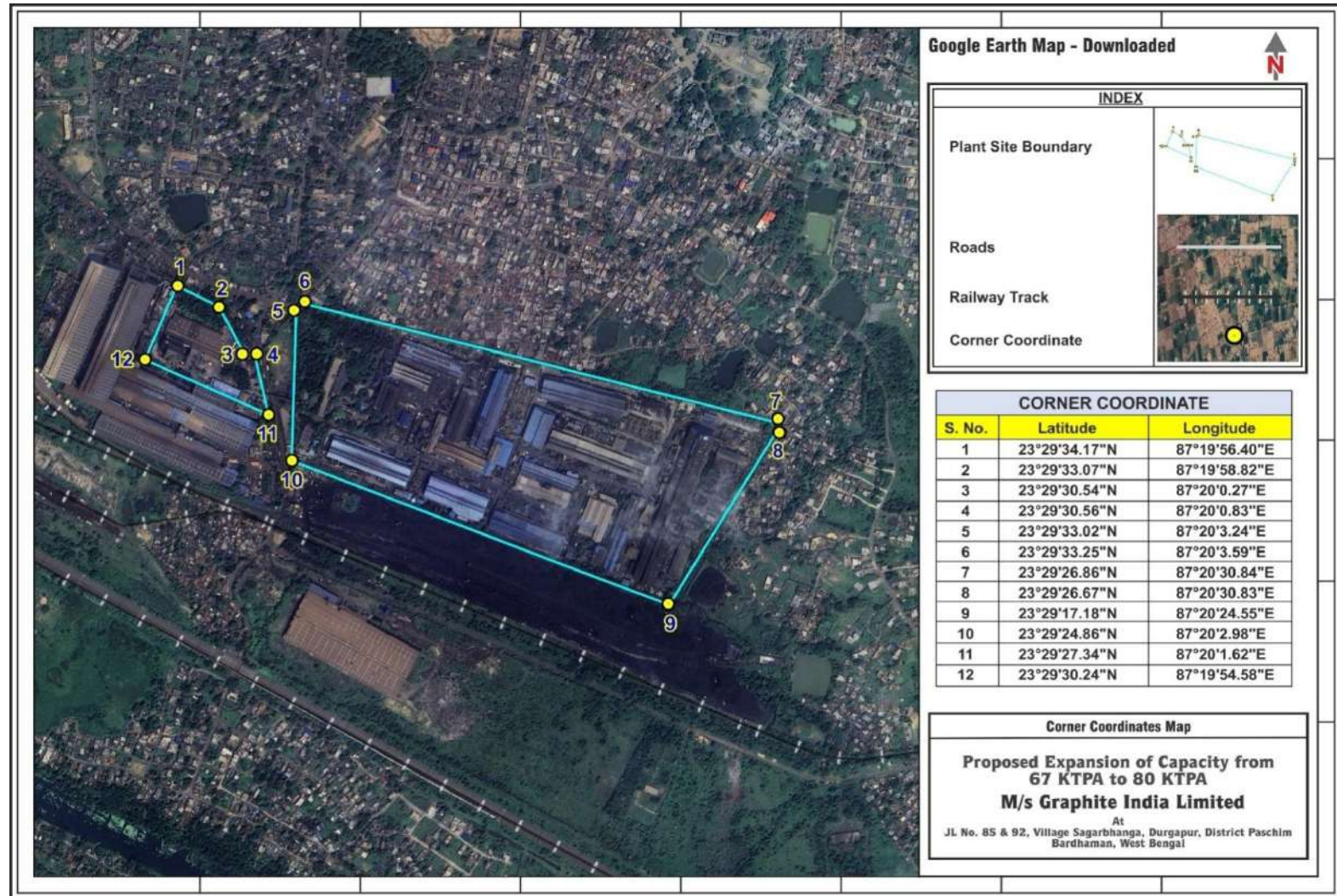


Figure 2: Corner Co-Ordinates Map

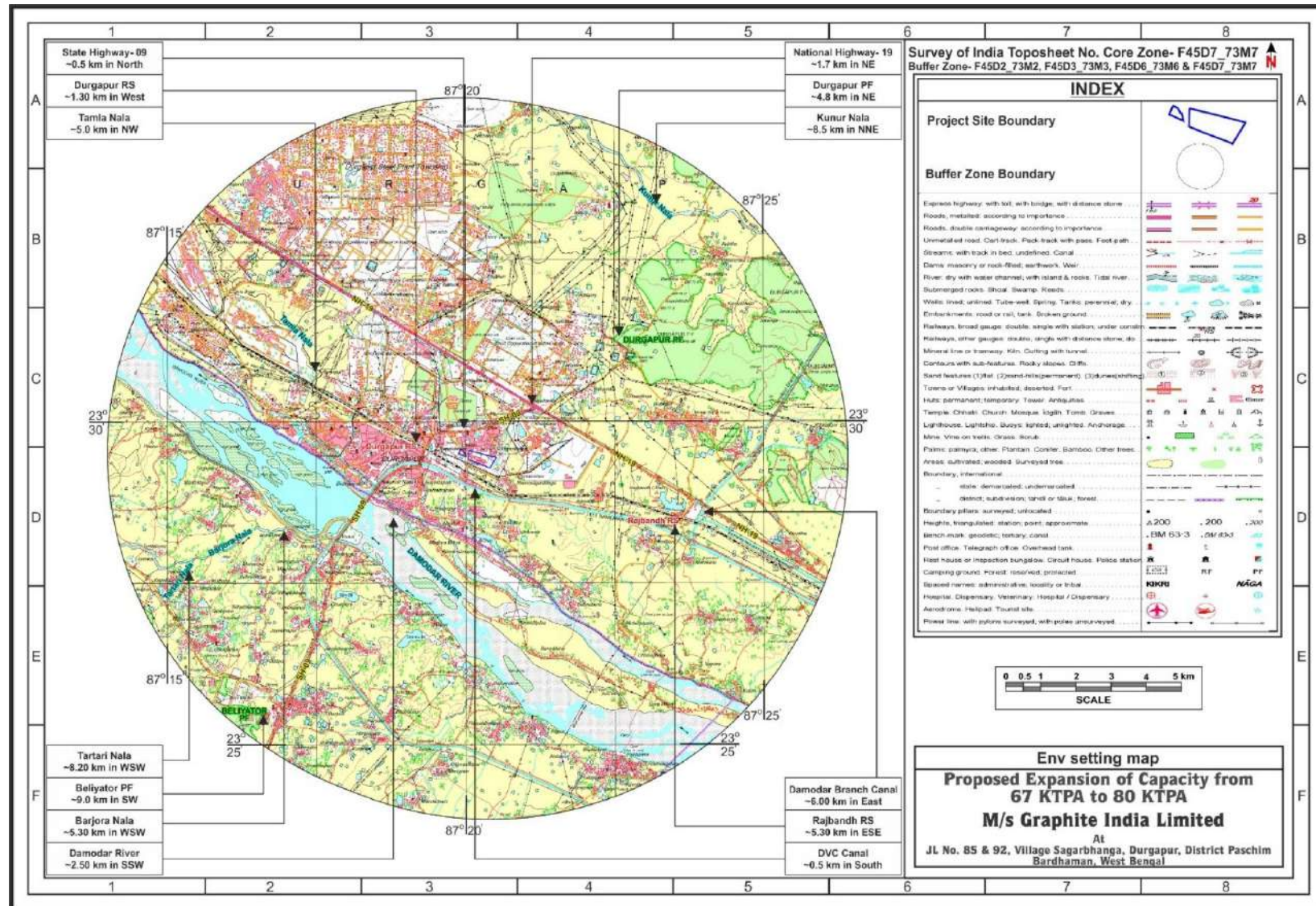


Figure4: Environment Setting Map of the Area

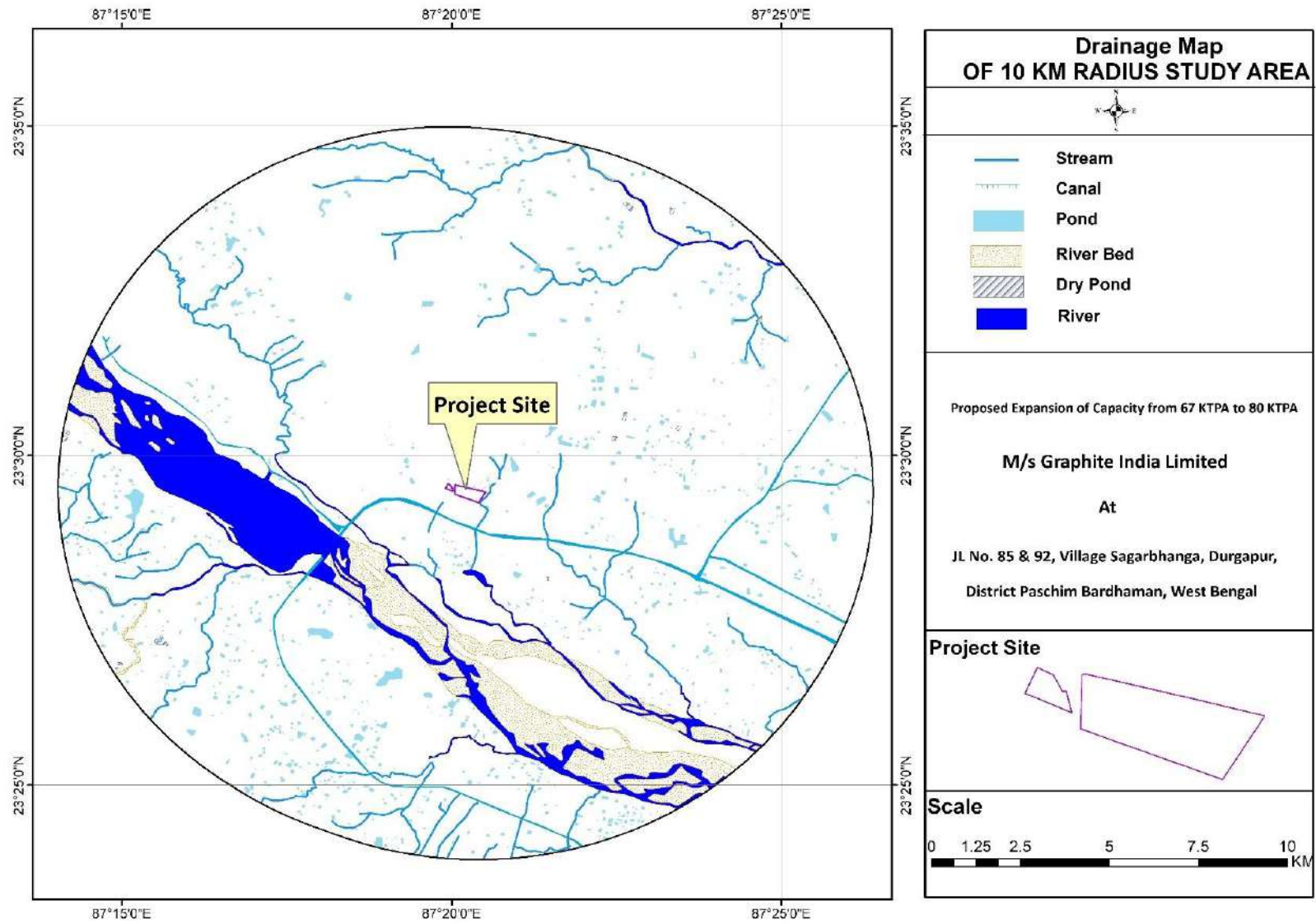


Figure 5: Drainage Pattern of the Area

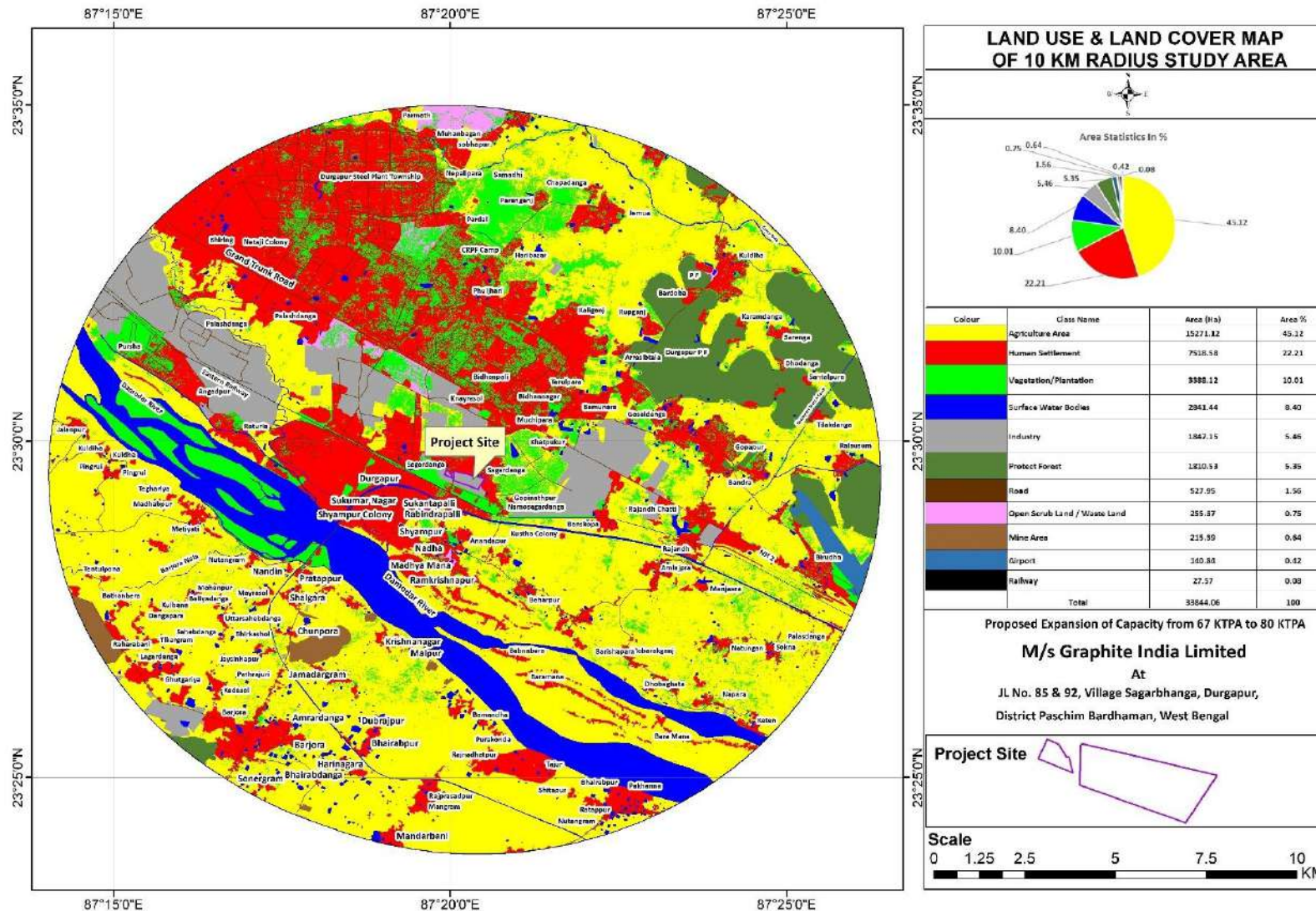


Figure 6: Land Use Map of the Study Area

v. **LAND USE PATTERN OF THE BUFFER ZONE (STUDY AREA)**

The physical setting of study area shows a contrast of immense dimensions and reveals a variety of landscapes influenced by relief, climate, vegetation, and economic use by man. The land use and land cover details of the buffer zone are given in table below:

Table 2: Land Use / Land Cover Details of Study Area

S. No.	Legend	Area (in ha)	% Area
1.	Agriculture area	15271.12	45.12
2.	Human Settlement	7518.58	22.21
3.	Vegetation/Plantation	3388.12	10.01
4.	Surface water bodies	2841.44	8.40
5.	Industry	1847.15	5.46
6.	Protected Forest	1810.53	3.35
7.	Road	527.95	1.56
8.	Open Scrub Land/Waste Land	255.37	0.75
9.	Mine Area	215.99	0.64
10.	Airport	140.84	0.42
11.	Railway	27.57	0.08
Total		33844.06	100

Source: LU/LC Map for Study Area from NRSC (Gov. Data)

Interpretation:

- The study area of 10 km radius mainly comprises of Agricultural area i.e., 15271.12 Ha (45.12 % of the total study area). The second dominant land characteristics is Human Settlement with 7518.58 Ha area i.e., 22.21 %, followed by Vegetation/Plantation with 3388.12 Ha area i.e., 10.01 % of the study area.
- There are water bodies in the area including Damodar River, Tamla Nala, Barjora Nala, Tartari Nala, DVC Canal & Kunur Nala which comprise of 8.40% of the study area.
- Industries occupy only 5.46 % of the land denoting the area still needs industrial growth.
- There are no Ecological Sensitive Areas (National Park, Wildlife Sanctuary, Biosphere Reserve etc.) within 10 km radius of the study area. Therefore, no forest land class was observed during classification. The Durgapur PF & Beliatore RF are found which comprise of 3.35% of the study area.
- Roads occupy 527.92 ha area i.e., 1.56 % & Railway line occupy 27.57 ha i.e., 0.08 % of total area.
- The area covered under open scrub/waste land is 255.37 ha i.e.0.75 % of study area.
- Others land features like Mine area 215.99 ha i.e. 0.64 % & Airport covers 140.84 ha i.e.0.42% of total area'

vi. SCOPE OF WORK AND OBJECTIVES WILDLIFE CONSERVATION PLAN

As per direction under ToR point “5 (v) Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area”, Preparation of Wildlife Conservation Plan for Schedule- I Species is mandatory. The objective of this plan is to address and alleviate the adverse effects caused by industrial activities and various other contributing factors. The 'Wildlife Conservation Plan' recognizes the rich biodiversity within the designated WCP area, which extends up to a 10- kilometre radius surrounding the core site, known as the buffer area. Collectively, these areas are referred to as the 'Wildlife Conservation Plan (WCP) area'. This comprehensive plan encompasses the assessment of habitat conditions, ecological dynamics, and the diverse range of plant and animal species within the study area.

There are various factors which tremendously affects the ecological systems such as urbanization, industrialization, illicit felling of trees, poaching, diseases, drought etc., which result in destruction of wildlife habitats (land, water, food), which further causes delimitation effect on the population of wildlife animals and degradation of the forest. To mitigate the impacts of plant related activities and other factors, Wildlife Conservation Plan for Schedule- I Species is necessary.

vii. PROVISIONS OF ALL RELEVANT ACTS AND REGULATIONS APPLICABLE TO THE WCP AREA LEGAL FRAMEWORK

India, as a matter of policy, upholds and promotes cement, mining, electricity, energy, chemical and other developmental projects on the condition that they align with the country's biological, physical, chemical, and social environment. Recognizing its status as one of the world's most biodiverse nations and as a signatory to various international conventions and treaties, India is committed to conserving its biodiversity, preserving natural habitats, and safeguarding migratory species. To this end, a robust legal framework comprising acts, laws, rules, and regulations is in place. Any activities or impacts that pose unmanageable or adverse consequences to the country's flora, fauna, and overall biodiversity are strictly prohibited and regulated by the following acts and regulatory authorities

S. No.	Guidelines/ Rules/ Acts
1.	The Environment (Protection) Act, 1986 and its subsequent amendments.
2.	The Air (Prevention and Control of Pollution) Act, 1981 and its subsequent amendments.
3.	The Water (Prevention and Control of Pollution) Act, 1974 and its subsequent amendments.
4.	The Wildlife (Protection) Act, 1972 and Wildlife (Protection) Amendment Act, 2022 its subsequent amendments.
5.	EIA Notification, 2006 dated 14 th September, 2006 and its subsequent amendments.
6.	Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 and its subsequent amendments.
7.	E-Waste (Management) Rules, 2016 and 2022 and its subsequent amendments.
8.	Bio-medical Waste Management Rules, 2016 and its subsequent amendments.
9.	The Battery (Management & Handing) Rules, 2022 and its subsequent amendments.

S. No.	Guidelines/ Rules/ Acts
10.	Plastic Waste Management Rules, 2016 and Plastic Waste Management (Amendment) Rules, 2022 and its amendments.
11.	Solid Waste Management Rules, 2016 and its subsequent amendments
12.	The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 (MSIHC Rules) and its subsequent Amendments.
13.	Construction and Demolition Waste Management Rules, 2016 and its subsequent amendments.
14.	The Noise pollution (Regulation and Control) Rules, 2000 and its subsequent amendments.
15.	The Public Liability Insurance Act 1991 & Rule 1991 and its subsequent amendments.
16.	Corporate Responsibility for Environmental Protection (CREP) Guidelines, 2003 and its subsequent Amendments.
17.	Latest notifications/ guidelines issued by Central Ground Water Authority (CGWA) and its subsequent amendments.
18.	Guidelines for Developing Greenbelts, March 2000 and its amendments
19.	Compliance of Extended Producer Responsibilities (EPR)
20.	Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
21.	Van (Sankashan Evam Samvardhan) Adhiniyam, 1980.

- **Environment Protection Act, 1986**

The Environment Protection Act of 1986 is a crucial law in India that aims to safeguard the environment. It establishes standards for pollution control, mandates environmental impact assessments for projects, and regulates hazardous substances. The act enforces penalties for violations and promotes sustainable development for a healthier environment. The Ministry of Environment, Forests and Climate Change (MoEF&CC, GoI) is responsible for the implementation and enforcement of the Environment (Protection) Act, 1986 and Environment Protection Rules, 1986 framed under the Act under Sections 6 and 25 of the Environment Protection Act, 1986.

- **Central Pollution Control Board**

The Central Pollution Control Board (CPCB) was constituted in September 1974, under Section 3 of the Water (Prevention and Control of Pollution) Act, 1974, for the purpose of implementing the provisions enshrined in the Water (Prevention and Control of Pollution) Act, 1974. The executive responsibilities for the industrial pollution prevention and control are primarily executed by the CPCB at the Central level, which is a statutory body, attached to the MoEF&CC, GoI. The CPCB works towards control of water, air, noise pollution, land degradation, hazardous substances and waste management.

- **Biological Diversity Act, 2002**

The Biological Diversity Act of 2002 in India aims to conserve and sustainably use the country's biological diversity. It establishes regulations for access to biological resources, promotes community participation, and ensures the fair sharing of benefits. The act also designates Biodiversity Heritage Sites for protection.

- **Indian Forest Act, 1927**

The Indian Forest Act, 1927 is comprehensive legislation relating to forest management in the country. Its main objective is to consolidate the pre-existing laws relating to forests, the transit of forest produce, and the duty leviable on the timber and other forest produce. The Act also made the conservation of forest and Wildlife more accountable. The Act has also defined the procedures to be followed in declaring reserve, protected, or village forests. Further, the Act has prohibited, grazing of cattle, felling of trees, fishing, quarrying, use of forest products, and hunting in these forests.

- **The Wildlife (Protection) Amendment Act, 2022**

The Government of India enacted The Wildlife (Protection) Amendment Act, 2022 for protection of Endangered Species: the act seeks to enhance punishment for illegal Wildlife trade. Better Management of Protected Areas: It provides for certain permitted activities like grazing or movement of livestock and Bonafide use of drinking and household water by local communities. Protection of Forest Lands: It is so critical because it equally inculcates in itself the protection of rights of the people who have been residing there since ages.

- **West Bengal Pollution Control Board (WBPCB)**

The West Bengal Pollution Control Board (WBPCB) is a body responsible for implementing various environmental legislations in the state of West Bengal. It focuses on issues related to air and water pollution, waste management, and works towards the prevention, control, or abatement of pollution. The WBPCB also oversees the monitoring of air quality and water quality, and the management of hazardous, biomedical, solid, and electronic waste.

XV. DESCRIPTION OF FOREST AND HABITAT CONDITION, WILDLIFE SCENARIO OF THE STUDY AREA:

Paschim Bardhaman district is a predominantly urban mining-industrial district in West Bengal. The headquarter of the district is Asansol. It was formed on 7 April 2017 after bifurcation of the erstwhile Bardhaman district as the 23rd district of West Bengal.

Forest and Habitat Condition:

Forest Cover: Situated in the Chotanagpur Plateau–Gangetic Plain interface, the district's upland lateritic and red-soil zones retain patches of dense deciduous forest, though much was cleared for coal mining and industry.

Flora: Predominant trees include Mango, Banyan, Peepal, Neem, Amla and Mulberry.

Forest Degradation: Forest degradation in Paschim Bardhaman district, West Bengal, is primarily driven by mining activities, leading to a significant reduction in vegetation cover and an increase in mining areas. This degradation is characterized by the conversion of forest land to agricultural land and mining areas.

Water Bodies: The district is enriched with the rivers like the Ajoy and its tributaries in the north and the Barakar, the Damodar and its branches in the south, west and southwest. Besides, there are

innumerable khals and gullies all over the area. The notable rivers and khals are Damodar, Barakar, Ajoy, Nonia, Tamla, Kunur, Tumuni etc.

Wildlife Scenario:

Mammals: Documented species include Bengal fox, Small Indian Civet, Grey Wolf, Jungle cat and smaller mammals like squirrels, mouse and rats are also found.

Birds: The region has a rich avian diversity, Durgapur Barrage hosts over 100 bird species—Myna, Warbler, ducks, doves, swifts, and parakeets.

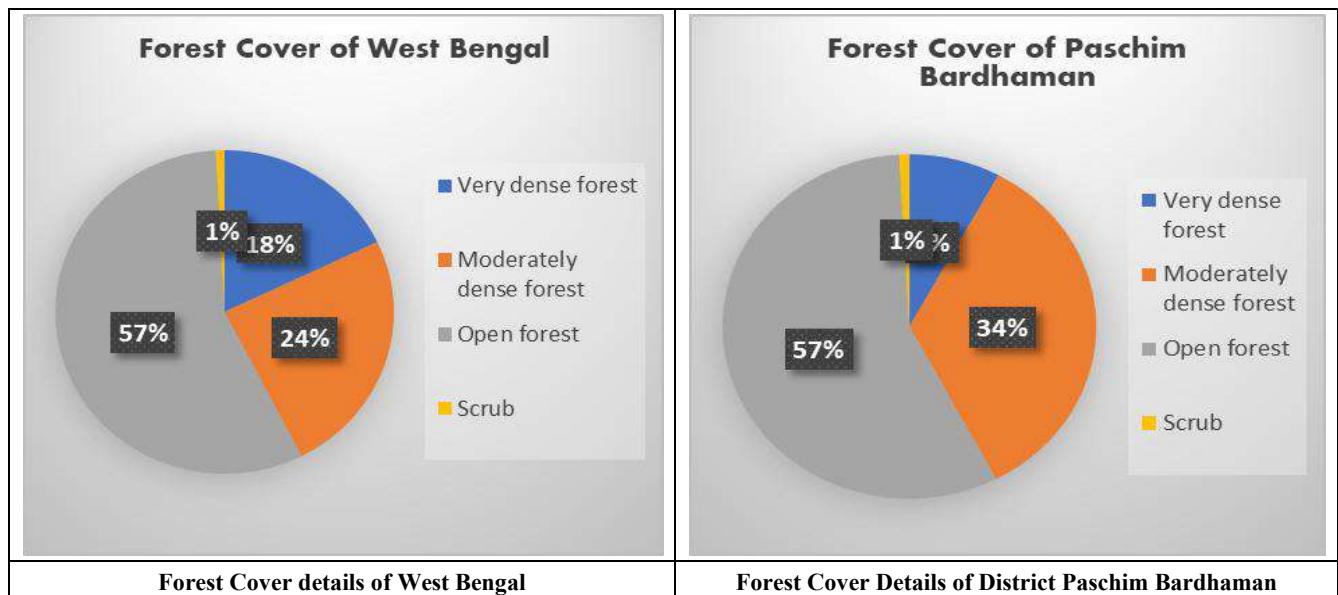
Reptiles and Amphibians: Common snakes: Common Indian krait, Wolf Snakes, Common Rat Snake and grass snakes. Monitor lizards, turtles, and amphibians in wetter zones are also recorded.

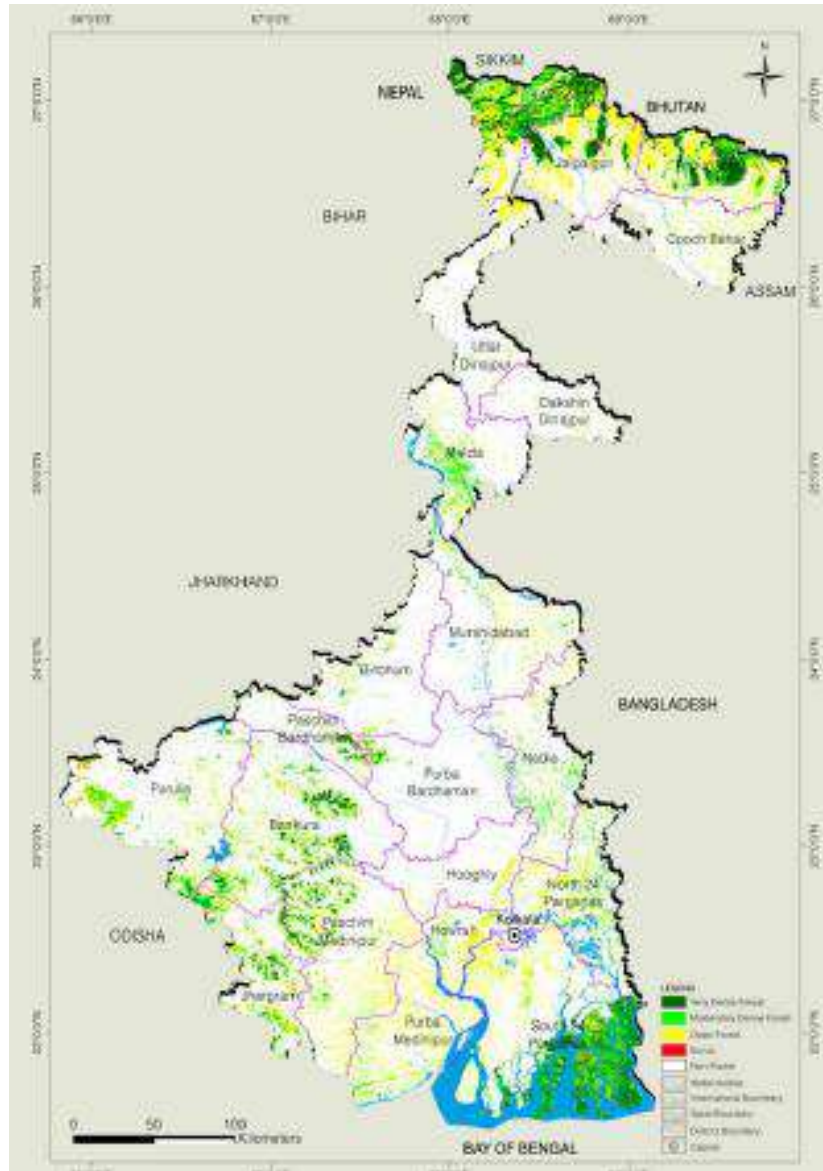
Insects: Rich butterfly and odonate diversity: Durgapur alone has 99 butterfly and 60+ odonate species, and likely more across the district.

Table 3: Forest Cover Details of West Bengal

Type of Forest	Forest Cover of West Bengal (sq.km)	Forest Cover of Paschim Bardhaman
Very dense forest	3037.10	11.93
Moderately dense forest	4175.38	51.75
Open forest	9619.85	85.53
Total	16833.33	149.21
Scrub	137.92	1.30

Source: Forest Survey of India, 2023





Source: Forest Survey of India

Figure 7: Forest Details of West Bengal

DISTRICT PROFILE OF PASCHIM BARDHAMAN

Paschim Bardhaman is a predominantly urban, mining-industrial district in West Bengal, India. It was formed on April 7, 2017, after the bifurcation of the erstwhile Bardhaman district. The district is characterized by its industrial landscape, including steel plants and coal mines, and is known for its laterite soil and rocky, undulating topography.

Topography

Paschim Bardhaman's topography is characterized by a rocky, undulating landscape, an extension of the Chota Nagpur plateau. This area features laterite soil and was historically covered in dense forests. The western part of the district, including parts of the Durgapur subdivision, exhibits this rocky terrain. While forests have been cleared in many areas, particularly in the coal-bearing regions and the western part of Durgapur, some forests remain in the eastern part of the district. The district also has rivers like the Damodar, Barakar, and Ajoy, contributing to the overall landscape.

Climate

Paschim Bardhaman district in West Bengal experiences a tropical savanna climate, marked by hot summers, a pronounced monsoon season, and mild winters. Summers, extending from March to June, are typically dry and intensely hot, with temperatures often rising above 40°C, especially in industrial towns like Asansol and Durgapur. The monsoon arrives in mid-June and lasts until September, bringing most of the district's annual rainfall of around 1200 to 1500 mm, which is vital for agriculture and replenishing water bodies like the Damodar and Ajay rivers. Winters, from November to February, are relatively cool and pleasant, with temperatures dropping to around 10°C. High humidity during the monsoon and dry, dusty conditions in summer are common.

Temperature:

Paschim Bardhaman district experiences a wide range of temperatures throughout the year, reflecting its tropical savanna climate. During the summer months from March to June, temperatures are high, often ranging between 35°C and 45°C, with May being the hottest month. Heatwaves and dry winds, known locally as "Loo," are common during this period, especially in industrial towns like Durgapur and Asansol. With the onset of the monsoon in mid-June, temperatures moderate slightly, falling to a range of 25°C to 35°C, although high humidity makes the weather feel warmer. In contrast, winters, from November to February, are mild and pleasant, with minimum temperatures occasionally dropping to 8°C and daytime temperatures hovering between 20°C and 25°C.

Rainfall:

Paschim Bardhaman district receives moderate to high rainfall, primarily during the monsoon season. The annual average rainfall ranges between 1200 mm and 1500 mm, with the majority—about 75% to 80%—falling between June and September due to the southwest monsoon. July and August are typically the wettest months. The rainfall is crucial for the district's agriculture, as it supports the cultivation of crops like paddy and pulses. However, uneven distribution and occasional heavy downpours can lead to waterlogging or short-term flooding, especially in low-lying areas along the Damodar and Ajay River basins. The rest of the year remains relatively dry, with occasional winter showers being rare.

Table 4: Rainfall data of 10 years

Year	Annual rainfall (in mm)
2015	1298.53
2016	1420.77
2017	1963.49
2018	1280.72
2019	1212.8
2020	1434.57
2021	1903.74
2022	1174.97
2023	1306.17
2024	1653
Minimum	1174.97
Maximum	1963.49
Average	1464.846

Rivers:

Paschim Bardhaman district is primarily drained by the Damodar and Ajay rivers, which are the major watercourses in the region.

Agriculture

Agriculture in Paschim Bardhaman district plays a supportive but less dominant role compared to its industrial sector, especially in urbanized areas like Durgapur and Asansol. The region's agriculture is largely monsoon-dependent, with paddy (rice) being the principal crop, cultivated mainly during the kharif season. In some areas, rabi crops like wheat, pulses, mustard, and vegetables are also grown, depending on irrigation availability. The soil in the western parts is lateritic and less fertile, while the eastern areas have more alluvial soil, making them somewhat more suitable for farming. Irrigation is supported by canals from the Damodar Valley Corporation (DVC), wells, and ponds, though many farmers still rely heavily on rainfall.

XVI. DESCRIPTION OF FLORA AND FAUNA OF THE WCP AREA SHOWING THE DETAILS OR HABITAT CONDITION, WILDLIFE SCENARIO OF THE ENDEMIC, THREATENED AND SCHEDULED SPECIES:

Understanding these impacts is vital for developing effective mitigation strategies that aim to minimize harm to biodiversity and promote ecological resilience. This report focuses on the assessment of biodiversity within 10 km radius study area of the project site and explores the potential impacts arising from the project activities. Furthermore, it aims to propose mitigation measures that can help conserve and protect biodiversity, ensuring the sustainable coexistence of the project and the surrounding natural environment.

Objectives of the Study

The primary objective of the current study is to conduct an observation, documentation, and evaluation of the environmental impact within a 10 km radius study area of the plant site. The survey conducted also focuses on describing the terrestrial and aquatic flora and fauna, with particular emphasis on identifying and studying Rare, Endangered, and Threatened species in the study area.

The present study was undertaken with the following objectives:

- To Carry out Primary field survey of flora and fauna and ecologically sensitive natural habitats in the study area.
- To understand the spectrum of domesticated and wild biodiversity of the study area.
- To study the likely impacts of the proposed project on the local biodiversity, and to suggest mitigation measure, if required, for threatened biota.
- To assess the nature and distribution of vegetation (Terrestrial and Aquatic) in and around the Project area.

To enumerate Endemic, Rare, Endangered and Threatened (RET Species), separately for core and buffer area, based on primary field surveys and clearly indicating the Schedule of fauna present as per

Wildlife Protection Act, 1972 and amendment in The Wildlife (Protection) Amendment Act, 2022. In case any Scheduled- I fauna occur in the study area, the conservation plan along with budgetary provisions for their conservation is to be prepared in consultation with the State Forest and Wildlife Department.

Faunal Survey Methodology and Data Sources

As part of the Wildlife Conservation Plan, during May,2025 field survey and site verification were undertaken over a period of two days within the Project Influence Area (PIA).

The objective of the survey was not to conduct an intensive faunal census, but to:

- Verify habitat characteristics
- Identify visible signs of wildlife presence-footprints, pugmarks and feeding signs, avifaunal indicators like bird calls and vocalisation, burrow and holes for small mammals and through human-wildlife indicators like crop damage or broken fences.

Observations were restricted to opportunistic sightings and indirect evidence, including animal signs, habitat features, and interaction with local landscape element.

❖ Local Inputs

Inputs from local residents were collected only as supplementary input and was considered after consistency checks and correlation with habitat conditions and published secondary literature. Such information was not treated as standalone scientific evidence, but was cross-verified through:

- Corroboration with field observations
- Comparison with published literature and reports or documents like people's biodiversity register for Durgapur Municipal Corporation.
- Consistency across multiple independent respondents

❖ Secondary Data Sources

Secondary data were obtained from:

- Published scientific literature and papers
- Wildlife Conservation Reports approved by DFO
- Wildlife research papers and regional biodiversity studies

These sources were used to supplement field findings and provide a broader ecological context.

Equipment Used

- **Binoculars (8×40 or 10×50)**- For distant visual observations of birds and mammals
- **Mobile camera** - For photographic documentation of habitat features and indirect wildlife signs
- **Field notebook & datasheets** - For recording observations, time, location, and habitat notes

Navigation & Location Recording

- **Mobile GPS application**-For recording approximate locations of observations and habitat features
- **Topographic map / Google Earth imagery (pre-field reference)**- For orientation and understanding landscape context.

Basic Measurement & Verification

- Measuring tape- For approximate measurement of tracks, dung piles, or trail widths
- Compass- For direction and orientation during field movement



Field Survey Photographs

Inventory of Flora

List of flora observed in the study area 10 km radius from the boundary of plant site and the secondary data including the core zone is mentioned in the list below:

Table 5: Inventory of Floral Diversity in Core & Buffer Zone of The Plant Site

Based on Actual Sighting, inputs from locals and Secondary Data

S · N o .	Scientific name	Local name / English Name	Family	Core	Buffer	IUCN status
Trees						
1.	<i>Mangifera indica</i>	Aam	Anacardiaceae	+	+	DD
2.	<i>Shorea robusta</i>	Sal/Shaal	Dipterocarpaceae	-	+	LC
3.	<i>Madhuca longifolia</i>	Mohua/Indian Butter Tree	Sapotaceae	-	+	NE
4.	<i>Schleichera oleosa</i>	Kusum/ Ceylon Oak	Sapindaceae	-	+	LC
5.	<i>Magnolia champaca</i>	Champa	Magnoliaceae	-	+	LC
6.	<i>Melia azedarach</i>	Pride of India/Ghora Neem	Meliaceae	-	+	LC
7.	<i>Spondias pinnata.</i>	Hog Plum/Aamra	Anacardiaceae	-	+	LC
8.	<i>Ficus racemosa</i>	Cluster Fig	Moraceae	-	+	LC
9.	<i>Bombax ceiba</i>	Red Silk Cotton Tree	Malvaceae	-	+	LC
10.	<i>Cassia fistula</i>	Amaltas/ Indian Laburnum	Fabaceae	-	+	LC
11.	<i>Tamarindus indica</i>	Tamarind	Fabaceae	-	+	LC
12.	<i>Saraca asoca</i>	Ashok	Fabaceae	+	+	NE
13.	<i>Bauhinia variegata</i>	Kanchan	Fabaceae	-	+	LC
14.	<i>Dalbergia sissoo</i>	Sisham	Fabaceae	-	+	LC
15.	<i>Pongamia pinnata</i>	Karanj	Fabaceae	-	+	LC
16.	<i>Gliricidia sepium</i>	Saranga	Fabaceae	-	+	LC
17.	<i>Acacia auriculiformis</i>	Akashmoni	Mimosiae	+	+	LC
18.	<i>Acacia nilotica</i>	Babul	Mimosiae	-	+	LC
19.	<i>Albizia lebbeck</i>	Shirish/ Indian Siris	Mimosaceae	+	+	LC
20.	<i>Ficus benghalensis</i>	Banyan	Moraceae	-	+	LC

S · N o ·	Scientific name	Local name / English Name	Family	Core	Buffer	IUCN status
21.	<i>Ficus religiosa</i>	Peepal	Moraceae	+	+	LC
22.	<i>Syzygium cumini</i>	Jam/Black Plum	Myrtaceae	+	+	LC
23.	<i>Phoenix sylvestris</i>	Date palm	Palmae	+	+	NE
24.	<i>Trema orientalis</i>	Indian Charcoal Tree/ Chikon	Cannabaceae	-	+	LC
25.	<i>Holoptelea integrifolia</i>	Nata karanja	Ulmaceae	-	+	LC
26.	<i>Michelia champaca</i>	Champak	Magnoliaceae	-	+	LC
27.	<i>Polyalthia longifolia</i>	Debdaru	Anonaceae	+	+	NE
28.	<i>Aegle marmelos</i>	Bael/ Wood apple	Rutaceae	-	+	NT
29.	<i>Limonia acidissima</i>	Elephant apple	Rutaceae	-	+	LC
30.	<i>Azadirachta indica</i>	Neem	Meliaceae	+	+	LC
31.	<i>Swietenia mahagoni</i>	Mahogany	Meliaceae	-	+	NT
32.	<i>Trevisa nudiflora</i>	Pituli	Euphorbiaceae	-	+	NE
33.	<i>Lagerstroemia speciosa</i>	Jarul	Lythraceae	+	+	NE
34.	<i>Terminalia catappa</i>	Indian Almond	Combretaceae	-	+	NE
35.	<i>Terminalia arjuna</i>	Arjun	Combretaceae	-	+	NE
36.	<i>Terminalia bellirica</i>	Bohera	Combretaceae	-	+	LC
37.	<i>Terminalia chebula</i>	Horitoki	Combretaceae	-	+	LC
38.	<i>Terminalia elliptica</i>	Asan	Combretaceae	-	+	LC
39.	<i>Citrus grandis</i>	Batabi Lebu	Rutaceae	-	+	LC
40.	<i>Butea monosperma</i>	Palash	Fabaceae	-	+	LC
41.	<i>Mimusops elengi</i>	Bakul	Sapotaceae	+	+	NE
42.	<i>Neolamarckia cadamba</i>	Kadam	Rubiaceae	+	+	NE
43.	<i>Haldina cordifolia</i>	Haldu	Rubiaceae	-	+	NE
44.	<i>Putranjiva roxburghii</i>	Putranjiva	Putranjivaceae	-	+	NE
45.	<i>Alstonia scholaris</i>	Chhatim	Apocyanaceae	+	+	NE
46.	<i>Wrightia antidysenterica</i>	Kurchi	Apocynaceae	-	+	NE
47.	<i>Dillenia indica</i>	Chalta	Dilleniaceae	+	+	NE
48.	<i>Moringa oleifera</i>	Sajina	Moringaceae	-	+	NE
49.	<i>Sonneratia apetala</i>	Keora	Lythraceae	-	+	NE
50.	<i>Gmelina arborea</i>	Gamar	Lamiaceae	-	+	NE
51.	<i>Tectona grandis</i>	Teak/Sheygun	Lamiaceae	+	+	NE
52.	<i>Murraya koenigii</i>	Curry tree	Rutaceae	-	+	LC
Shrubs						
1.	<i>Adhatoda vasica</i>	Basaka	Acanthaceae	-	+	NE
2.	<i>Malvaviscus arboreus</i>	Lonka Joba/Wax Mallow	Malvaceae	-	+	LC
3.	<i>Barleria cristata</i>	Joti	Acanthaceae	-	+	NE
4.	<i>Nyctanthes arbor tristis</i>	Shiuli/Parijat	Oleaceae	-	+	LC
5.	<i>Annona squamosa</i>	Custard apple	Anonaceae	-	+	NE
6.	<i>Calotropis procera</i>	Akanda	Apocynaceae	-	+	LC
7.	<i>Solanum surattense</i>	Kantikari	Solanaceae	-	+	NE
8.	<i>Ziziphus oenoplia</i>	Kool	Rhamnaceae	-	+	NE
9.	<i>Abutilon indicum</i>	Indian Mallow	Malvaceae	-	+	NE
10.	<i>Urena lobata</i>	JangliGhagra/ Banokra	Malvaceae	-	+	LC
11.	<i>Hibiscus sabdariffa</i>	Roselle/ Chukar	Malvaceae	-	+	NE
12.	<i>Hibiscus rosa-sinensis</i>	China Rose/ Joba	Malvaceae	-	+	LC

S · N o ·	Scientific name	Local name / English Name	Family	Core	Buffer	IUCN status
13.	<i>Hibiscus mutabilis</i>	Sitapadma	Malvaceae	-	+	LC
14.	<i>Phyllanthus emblica</i>	Amlaki	Phyllanthaceae	+	+	LC
15.	<i>Phyllanthus niruri</i>	Bhui-amla	Phyllanthaceae	-	+	LC
16.	<i>Vitex negundo</i>	Nishinda	Lamiaceae	-	+	NE
17.	<i>Clerodendrum infortunatum</i>	Bhant/Ghetu	Lamiaceae	-	+	NE
18.	<i>Clerodendrum inerme</i>	Banajai	Lamiaceae	-	+	NE
Herbs						
1.	<i>Andrographis paniculata</i>	Kalmegh	Acanthaceae	-	+	LC
2.	<i>Drosera burmannii</i>	Sundew	Droseraceae	-	+	LC
3.	<i>Rungia parviflora</i>	Small-flowered Rungia	Acanthaceae	-	+	NE
4.	<i>Centella asiatica</i>	Thankuni	Apiaceae	-	+	LC
5.	<i>Aganosma caryophyllata</i>	Clove-scented Aganosma	Apocynaceae	-	+	NE
6.	<i>Amaranthus spinosus</i>	Spiny Amaranth	Amaranthaceae	-	+	NE
7.	<i>Achyranthes aspera</i>	Devil's horsewhip	Amaranthaceae	-	+	NE
8.	<i>Alternanthera sessilis</i>	Matsyaakshi	Amaranthaceae	-	+	NE
9.	<i>Eclipta prostrata</i>	Bhringraj	Compositae	-	+	NE
10.	<i>Blumea lacera</i>	Blumea	Compositae	-	+	NE
11.	<i>Tridax procumbens</i>	Kanfuli	Compositae	-	+	NE
12.	<i>Vernonia cinerea</i>	Purple Fleabane, Ironweed	Compositae	-	+	NE
13.	<i>Grangea maderaspatana</i>	Madras Carpet	Compositae	-	+	NE
14.	<i>Gnaphalium indicum</i>	Indian Cudweed	Compositae	-	+	NE
15.	<i>Coccinia grandis</i>	Ivy Gourd, Kundru	Cucurbitaceae	-	+	NE
16.	<i>Cassia sophera</i>	Sophera Cassia	Caesalpinae	-	+	NE
17.	<i>Cassia tora</i>	Chakramarda	Caesalpinae	-	+	NE
18.	<i>Acalypha indica</i>	Indian Copperleaf	Euphorbiaceae	-	+	NE
19.	<i>Chrozophora plicata</i>	Plicate Chrozophor	Euphorbiaceae	-	+	NE
20.	<i>Ocimum tenuiflorum</i>	Tulsi	Lamiaceae	-	+	NE
21.	<i>Leucas aspera</i>	Dronapushpi	Labiatae	-	+	NE
22.	<i>Anisomeles ovata</i>	Oval-leaved Anisomeles	Labiatae	-	+	NE
23.	<i>Oldenlandia corymbosa</i>	Bhumi Amla	Rubiaceae	-	+	NE
24.	<i>Dentella repens</i>	Creeping Dentella	Rubiaceae	-	+	NE
25.	<i>Spermacoce hispida</i>	Hairy Buttonweed	Rubiaceae	-	+	NE
26.	<i>Solanum nigrum</i>	Black Nightshade, Makoi	Solanaceae	-	+	NE
27.	<i>Evolvulus nummularius</i>	Dwarf Morning Glory	Convolvulaceae	-	+	NE
28.	<i>Canscora diffusa</i>	Shankpushpi	Gentianaceae	-	+	NE
29.	<i>Hydrocotyle asiatica</i>	Indian Pennywort, Gotu Kola	Umbeliferae	-	+	LC
30.	<i>Sida cordifolia</i>	Country Mallow, Bala	Malvaceae	-	+	NE
31.	<i>Sida acuta</i>	Broom Weed	Malvaceae	-	+	NE
32.	<i>Triumfetta rhomboidea</i>	Diamond-leaf Triumfetta	Malvaceae	-	+	NE
33.	<i>Cleome viscosa</i>	Asian Spider flower, Dog Mustard	Cleomaceae	-	+	NE

S · N o ·	Scientific name	Local name / English Name	Family	Core	Buffer	IUCN status
34.	<i>Boerhavia repens</i>	Spreading Hogweed	Nyctaginaceae	-	+	NE
35.	<i>Polygonum barbatum</i>	Bristly Knotweed	Polygonaceae	-	+	NE
36.	<i>Rumex maritimus</i>	Golden Dock, Sea Dock	Polygonaceae	-	+	NE
37.	<i>Hygrophila spinosa</i>	Kokilaksha, Gokulakanta	Acanthaceae	-	+	NE
38.	<i>Pouzolizia indica</i>	Indian Pouzolzia	Urticaceae	-	+	NE
39.	<i>Cyperus rotundus</i>	Nut Grass, Motha	Cyperaceae	-	+	NE
40.	<i>Saccharum spontaneum</i>	Wild Sugarcane, Kans Grass	Poaceae	-	+	NE
41.	<i>Imperata arundinacea</i>	Cogon Grass, Lalang Grass	Poaceae	-	+	NE
42.	<i>Cynodon dactylon</i>	Bermuda Grass, Doob Grass	Poaceae	-	+	NE
43.	<i>Porteresia coarctata</i>	Wild Rice	Poaceae	-	+	NE
44.	<i>Laportea interrupta</i>	Stinging Nettle-like Plant	Urticaceae	-	+	NE
45.	<i>Vitis quadrifida</i>	Wild Grape	Vitaceae	-	+	NE
46.	<i>Oxalis corniculata</i>	Creeping Wood Sorrel, Changeri	Oxalidaceae	-	+	NE
47.	<i>Derris pinnata</i>	Derris Vine	Papilionaceae	-	+	NE
48.	<i>Justicia gendarussa</i>	Willow-leaved Justicia, Kalimundi	Acanthaceae	-	+	NE
Ferns						
1.	<i>Marsilea quadrifolia</i>	Shushni Shaak	Marsileaceae	-	+	LC
2.	<i>Diplazium sp.</i>	False Staghorn Fern	Athyriaceae	-	+	LC
Macrophytes						
1.	<i>Hygrophila spinosa</i>	Gokulakanta / Marsh barbel	Acanthaceae	-	+	NE
2.	<i>Ludwigia adscendens</i>	Water primrose	Onagraceae	-	+	NE
3.	<i>Monochoria hastata</i>	Arrow-leaf monochoria	Pontederiaceae	-	+	NE
Phytoplankton's						
1.	<i>Microcystis sp.</i>	Blue-green algae	Microcystaceae	+		NE
2.	<i>Navicula sp.</i>	Navicula diatoms	Naviculaceae	+		NE
3.	<i>Pleurosigma sp.</i>	Pennate diatoms	Bacillariaceae	+		NE
4.	<i>Spirogyra sp.</i>	Water silk	Zygnemataceae	+		NE
5.	<i>Oscillatoria sp.</i>	Blue-green algae mat	Oscillatoriaceae	+		NE
6.	<i>Scenedesmus sp.</i>	Green algae	Scenedesmaceae	+		NE
7.	<i>Cymbella sp.</i>	Boat-shaped diatoms	Cymbellaceae	+		NE
8.	<i>Closterium sp.</i>	Crescent algae	Closteriaceae	+		NE

Source: Source: Based on Actual Sighting, Inputs from locals and Secondary Data

Note: Categories as per IUCN Red List refers Data Deficient (DD), Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Endangered (EN), Critically Endangered (CR), Extinct in the Wild (EW) & Extinct (EX) NE- Not Evaluated.

Interpretation:

- Among the trees, Fabaceae, Caesalpinaceae, and Moraceae are the most dominant families. Other frequently represented families include Rutaceae, Meliaceae, Combretaceae, and Malvaceae.

- A primary field survey was carried out within 10 km radius impact zone in and around the Plant area to study the floral and faunal diversity of the terrestrial and aquatic environment of the study area.
- No National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals Eco-sensitive Zone and Eco-sensitive areas exists within 10 km radius study area.
- There are total no critically endangered species, no endangered whereas 39 species are least concerned, no Vulnerable, 2 Near Threatened and 75 species are not evaluated.

Table 6: Inventory Of Faunal Diversity in Core & Buffer Zone of Plant Site

Based on Field Survey, based on inputs from locals and Perused from Secondary Data

S. No.	Scientific name	Common name/ English Name	Wildlife (Protection) Amendment, 2022			Core	Buffer	IUCN conserv ation status
			Schedule s	Part	SL No.			
Mammalian Diversity								
1.	<i>Viverricula indica</i>	Small Indian Civet	I	A	55	-	+	LC
2.	<i>Funambulus pennantii</i>	Northern/Five-striped Palm Squirrel	-	-	-	+	+	LC
3.	<i>Rattus rattus rufescens</i>	House Rat	-	-	-	+	+	LC
4.	<i>Rattus rattus arboreus</i>	Tree Rat	-	-	-	+	+	NE
5.	<i>Mus musculus castaneus</i>	House Mouse	-	-	-	-	+	NE
6.	<i>Mus musculus domesticus</i>	House Mouse	-	-	-	+	+	NE
7.	<i>Cynopterus sphinx</i>	Short-nosed Fruit-bat	-	-	-	-	+	LC
8.	<i>Rousettus leschenaultii</i>	Fulvous Fruit-Bat	-	-	-	-	+	LC
9.	<i>Vulpes bengalensis</i>	Bengal Fox	I	A	84	-	+	LC
10.	<i>Mus booduga</i>	Common Indian Field Mouse	-	-	-	+	+	NE
11.	<i>Bandicota indica</i>	Greater Bandicoot Rat	-	-	-	-	+	NE
12.	<i>Canis aureus</i>	Golden Jackal	I	A	22	-	+	LC
13.	<i>Canis lupus pallipes</i>	Indian Grey Wolf	I	A	21	-	+	LC
14.	<i>Semnopithecus entellus</i>	Hanuman Langur	II	A	24	-	+	LC
15.	<i>Felis chaus</i>	Jungle cat	I	A	42	-	+	LC
16.	<i>Urva edwardsii</i>	Indian Grey Mongoose	I	A	97	-	+	LC
17.	<i>Hyaena hyaena</i>	Striped Hyaena	I	A	89	-	+	NT
18.	<i>Lepus nigricollis</i>	Black-naped Hare	II	A	13	-	+	LC
19.	<i>Bandicota bengalensis</i>	Lesser Bandicoot Rat	-	-	-	-	+	LC
20.	<i>Rattus norvegicus</i>	Brown Rat	-	-	-	+	+	LC
21.	<i>Rattus rattus</i>	Black Rat	-	-	-	-	+	LC
22.	<i>Pteropus giganteus</i>	Indian Flying Fox	II	A	5	-	+	LC
23.	<i>Suncus murinus</i>	Asian House Shrew	-	-	-	-	+	LC
24.	<i>Elephas maximus</i>	Asian Elephant	I	A	83	-	+	EN
Reptilian Diversity								
1.	<i>Hemidactylus brookii</i>	Brook's gecko	-	-	-	-	+	LC
2.	<i>Hemidactylus flaviviridis</i>	Northern house gecko	-	-	-	-	+	NE
3.	<i>Calotes versicolor</i>	Common Garden lizard	-	-	-	+	+	NE
4.	<i>Eutropis carinata</i>	Keeled Indian Mabuya	-	-	-	-	+	NE
5.	<i>Eutropis macularia</i>	Little Skink	-	-	-	-	+	NE
6.	<i>Lycodon aulicus</i>	Common wolf snake	-	-	-	-	+	NE
7.	<i>Indotyphlops braminus</i>	Brahminy Blind Snake	-	-	-	-	+	NE
8.	<i>Ptyas mucosa</i>	Dhaman or Common Rat Snake	I	C	26	-	+	NE
9.	<i>Fowlea piscator</i>	Checkered Keel back	I	C	25	-	+	NE

S. No.	Scientific name	Common name/ English Name	Wildlife (Protection) Amendment, 2022			Core	Buffer	IUCN conserv ation status
			Schedule s	Part	SL No.			
10.	<i>Bungarus caeruleus</i>	Common Indian Krait	-	-	-	-	+	LC
11.	<i>Eryx conicus</i>	Common Sand Boa	II	C	14	-	+	NE
12.	<i>Amphiesma stolatum</i>	Striped Keelback	-	-	-	-	+	NE
13.	<i>Varanus flavescens</i>	Yellow or Golden Monitor Lizard	I	C	24	-	+	LC
14.	<i>Naja kaouthia</i>	Monocled cobra	I	C	18	-	+	LC
15.	<i>Daboia russelii</i>	Russell's viper	I	C	30	-	+	LC
Amphibian Diversity								
1.	<i>Duttaphrynus melanostictus</i>	Common Indian Toad	-	-	-	+	+	LC
2.	<i>Duttaphrynus stomaticus</i>	Marbled Toad	-	-	-	-	+	LC
3.	<i>Euphlyctis cyanophlyctis</i>	Skipping Frog	-	-	-	-	+	LC
4.	<i>Fejervarya limnocharis</i>	Paddy field frog	-	-	-	-	+	LC
5.	<i>Hoplobatrachus tigerinus</i>	Indian bull frog	II	Part B	S No.1 3	-	+	LC
Fish Diversity								
1.	<i>Lates calcarifer</i>	Bhetki	-	-	-	-	+	LC
2.	<i>Glossogobius giuris</i>	Beley	-	-	-	-	+	LC
3.	<i>Salmostoma sardinella</i>	Chela	-	-	-	-	+	LC
4.	<i>Osteobrama cotio</i>	Chanda	-	-	-	-	+	LC
5.	<i>Gibelion catla</i>	Catla	-	-	-	-	+	LC
6.	<i>Channa gachua</i>	Chang	-	-	-	-	+	VU
7.	<i>Hypophthalmichthys molitrix</i>	Silver carp	-	-	-	-	+	NT
8.	<i>Cirrhinus mrigala</i>	Mrigal	-	-	-	-	+	LC
9.	<i>Cyprinus carpio</i>	American rui	-	-	-	-	+	LC
10.	<i>Labeo rohita</i>	Rohu	-	-	-	-	+	LC
11.	<i>Labeo bata</i>	Bata	-	-	-	-	+	NE
12.	<i>Labeo calbasu</i>	Kalbous	-	-	-	-	+	LC
13.	<i>Pethia sophera</i>	Punthi	-	-	-	-	+	NE
14.	<i>Clarias batrachus</i>	Magur	-	-	-	-	+	NE
15.	<i>Heteropneustes fossilis</i>	Singi	-	-	-	-	+	LC
16.	<i>Channa striata</i>	Shol	-	-	-	-	+	NE
17.	<i>Channa punctata</i>	Lata	-	-	-	-	+	NE
18.	<i>Oreochromis mossambicus</i>	Tilapia	-	-	-	-	+	NE
19.	<i>Anabas testudineus</i>	Koi	-	-	-	-	+	NE
20.	<i>Mastacembelus armatus</i>	Pakal	-	-	-	-	+	NE
21.	<i>Macrognathus pancalus</i>	Pakal	-	-	-	-	+	NE
Avifauna								
1.	<i>Ardea cinerea</i>	Grey Heron	II	B	35	-	+	LC
2.	<i>Pavo cristatus</i>	Indian Peafowl	I	B	161	-	+	LC
3.	<i>Ardea purpurea</i>	Purple Heron	II	B	43	-	+	LC
4.	<i>Ardeola grayii</i>	Pond Heron	II	B	36	-	+	LC
5.	<i>Bubulcus ibis</i>	Cattle egret	II	B	29	-	+	LC
6.	<i>Ardea alba</i>	Great Egret	II	B	34	-	+	LC
7.	<i>Egretta garzetta</i>	Little Egret	II	B	40	-	+	LC
8.	<i>Dendrocygna javanica</i>	Lesser Whistling Teal	II	B	248	-	+	LC
9.	<i>Anas acuta</i>	Pintail	II	B	254	-	+	LC
10.	<i>Nettapus coromandelianus</i>	Cotton Teal	I	B	26	-	+	LC
11.	<i>Sarkidiornis melanotos</i>	Comb Duck	II	B	247	-	+	LC

S. No.	Scientific name	Common name/ English Name	Wildlife (Protection) Amendment, 2022			Core	Buffer	IUCN conserv ation status
			Schedule s	Part	SL No.			
12.	<i>Tringa ochropus</i>	Green Sandpiper	II	B	851	-	+	LC
13.	<i>Actitis hypoleucos</i>	Common Sandpiper	II	B	844	-	+	LC
14.	<i>Streptopelia decaocto</i>	Indian Ringed Dove	II	B	737	+	+	LC
15.	<i>Streptopelia tranquebarica</i>	Red Collared Dove	II	B	750	-	+	LC
16.	<i>Streptopelia chinensis</i>	Spotted Dove	II	B	753	-	+	LC
17.	<i>Eudynamis scolopaceus</i>	Koel	II	B	194	+	+	LC
18.	<i>Centropus sinensis</i>	Coucal	II	B	201	-	+	LC
19.	<i>Apus affinis</i>	Little Swift	II	B	1010	-	+	LC
20.	<i>Cypsiurus balasiensis</i>	Palm Swift	II	B	1005	-	+	LC
21.	<i>Alcedo atthis</i>	Common Kingfisher	II	B	493	-	+	LC
22.	<i>Merops orientalis</i>	Green Bee-eater	II	B	26	-	+	LC
23.	<i>Coracias benghalensis</i>	Indian Roller	II	B	829	-	+	LC
24.	<i>Hirundo spp.</i>	Swallow	II	B	-	+	+	LC
25.	<i>Oriolus xanthornus</i>	Black-hooded oriole	II	B	643	-	+	LC
26.	<i>Dicrurus macrocercus</i>	Black Drongo	II	B	223	-	+	LC
27.	<i>Sturnia malabarica</i>	Chestnut tailed starling	II	B	953	-	+	LC
28.	<i>Gracupica contra</i>	Indian Pied myna	II	B	949	-	+	LC
29.	<i>Acridotheres fuscus</i>	Jungle Myna	II	B	960	+	+	LC
30.	<i>Acridotheres tristis</i>	Common Myna	II	B	955	-	+	LC
31.	<i>Corvus splendens</i>	House Crow	-	-	-	+	+	LC
32.	<i>Turdoides striata</i>	Jungle Babbler	II	-	-	+	+	LC
33.	<i>Cisticola juncidis</i>	Zitting Cisticola	II	B	162	-	+	LC
34.	<i>Orthotomus sutorius</i>	Tailor Bird	II	B	151	-	+	LC
35.	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	II	B	819	-	+	LC
36.	<i>Motacilla alba</i>	White Wagtail	II	B	774	-	+	LC
37.	<i>Leptocoma zeylonica</i>	Purple-rumped Sunbird	II	B	984	-	+	LC
38.	<i>Cinnyris asiaticus</i>	Purple sunbird	II	B	983	-	+	LC
39.	<i>Passer domesticus</i>	House sparrow	II	B	940	+	+	LC
40.	<i>Lonchura punctulata</i>	Scaly Breasted Munia	II	B	622	-	+	LC
41.	<i>Amaurornis phoenicurus</i>	White Breasted Water Hen	II	B	815	-	+	LC
42.	<i>Gallinula chloropus</i>	Common Moorhen	II	B	804	-	+	LC
43.	<i>Porphyrio poliocephalus</i>	Grey Headed Swamphen	II	B	807	-	+	LC
44.	<i>Fulica atra</i>	Coot	II	B	806	-	+	LC
45.	<i>Phalacrocorax carbo</i>	Cormorant	II	B	163	-	+	LC
46.	<i>Microcarbo niger</i>	Little Cormorant	II	B	165	-	+	LC
47.	<i>Psittacula eupatria</i>	Alexandrine Parakeet	II	B	686	-	+	LC
48.	<i>Psittacula krameri</i>	Rose ringed Parakeet	II	B	693	+	+	LC
49.	<i>Psittacula cyanocephala</i>	Plum-headed Parakeet	II	B	692	-	+	LC
50.	<i>Tachybaptus ruficollis</i>	Little grebe	II	B	442	-	+	LC
51.	<i>Ixobrychus sinensis</i>	Yellow Bittern	II	B	27	-	+	LC
52.	<i>Spatula querquedula</i>	Garganey	II	B	242	-	+	LC
53.	<i>Hydrophasianus chirurgus</i>	Pheasant-tailed jacana	II	B	488	-	+	LC
54.	<i>Metopidius indicus</i>	Bronze winged Jacana	II	B	487	-	+	LC
55.	<i>Gallinago stenura</i>	Pintail Snipe	II	B	859	-	+	LC
56.	<i>Accipter badius</i>	Shikra	I	B	105	-	+	LC
57.	<i>Milvus migrans</i>	Black Kite	II	B	500	-	+	LC
58.	<i>Pernis ptilorhynchus</i>	Oriental Honey Buzzard	II	B	504	-	+	LC
59.	<i>Halcyon smyrnensis</i>	White-Throated	II	B	489	-	+	LC

S. No.	Scientific name	Common name/ English Name	Wildlife (Protection) Amendment, 2022			Core	Buffer	IUCN conservation status
			Schedules	Part	SL No.			
		Kingfisher						
60.	<i>Prinia hodgsonii</i>	Grey breasted Prinia	II	B	155	-	+	LC
61.	<i>Prinia inornata</i>	Plain Prinia	II	B	158	-	+	LC
62.	<i>Columba livia</i>	Pigeon	-	-	-	-	+	LC
63.	<i>Coracina macei</i>	Indian Cuckoo shrike	II	B	605	-	+	LC
64.	<i>Vanellus malabaricus</i>	Yellow-wattled Lapwing	II	B	798	-	+	LC
65.	<i>Cuculus micropterus</i>	Indian Cuckoo	II	B	206	-	+	LC
66.	<i>Francolinus pondicerianus</i>	Grey Francolin	II	B	701	-	+	LC
67.	<i>Phylloscopus nitidus</i>	Green Warbler	II	B	113	-	+	LC
68.	<i>Tadorna ferruginea</i>	Ruddy Shelduck	II	B	259	-	+	LC
69.	<i>Netta rufina</i>	Red-crested Pochard	II	B	258	-	+	LC
70.	<i>Charadrius alexandrinus</i>	Kentish Plover	II	B	789	-	+	LC
71.	<i>Glareola lactea</i>	Small Pratincole	II	B	169	-	+	LC
72.	<i>Sterna hirundo</i>	Common Tern	II	B	455	-	+	LC
73.	<i>Charadrius dubius</i>	Little Ringed Plover	II	B	791	-	+	LC
74.	<i>Calidris temminckii</i>	Temminck's Stint	II	B	871	-	+	LC
75.	<i>Ichthyiaetus ichthyiaetus</i>	Pallas's Gull	II	B	465	-	+	LC
76.	<i>Riparia chinensis</i>	Gray-throated Martin	II	B	993	-	+	LC
77.	<i>Acrocephalus stentoreus</i>	Clamorous Reed Warbler	II	B	820	-	+	LC
78.	<i>Acrocephalus agricola</i>	Paddyfield Warbler	II	B	825	-	+	LC
79.	<i>Riparia riparia</i>	Bank Swallow	II	B	1000	-	+	LC
80.	<i>Riparia diluta</i>	Pale Martin	II	B	998	-	+	LC
Zooplanktons								
1.	<i>Keratella sp.</i>	Rotifer (Group)	-	-	-	-	+	NE
2.	<i>Cyclops spp</i>	Copepods (Group)	-	-	-	-	+	NE
3.	<i>Daphnia spp.</i>	Water Flea/Cladocera (Group)	-	-	-	-	+	NE

Interpretation

The study area has Durgapur Protected Forest & Beliatare Reserve Forest. Therefore, the biodiversity is medium in the study area due to dominance of anthropogenic activity in the study area. There are total 148 species of faunal diversity in which 24 species are of mammals, 5 species of amphibians and 15 species of Reptiles, 21 species of Fishes & 3 species of zooplankton have been found in the study area. The majority of species fall under the Least Concern (LC) category as per IUCN, while 2 species are Near Threatened (NT) and 1 species is Vulnerable (VU) and 1 species is Endangered (EN). Importantly, several species are protected under Schedule I and II of the Wildlife (Protection) Amendment Act, 2022.

The Wildlife (Protection) Amendment Act, 2022 dated 19th Dec., 2022 which came into force from 1st April, 2023 as per the MoEF&CC Notification vide S.O. 1394(E) dated 22nd March 2023, there

are sixteen listed faunal species present within 10 km radius study area, are now classified as Schedule – I species: Cotton Teal or Cotton Pygmy Goose (*Nettapus coromandelianus*), Dhaman or Common Rat Snake (*Ptyas mucosus*), Bengal Fox (*Vulpes bengalensis*), Peacock or India Peafowl (*Pavo cristatus*), Small Indian Civet (*Viverricula indica*), Golden Jackal (*Canis aureus*), Indian Grey Wolf (*Canis lupus pallipes*), Jungle cat (*Felis chaus*), Indian Grey Mongoose (*Urva edwardsii*), Striped Hyaena (*Hyaena hyaena*), Asian Elephant (*Elephas maximus*), Checkered keelback (*Fowlea piscator*), Yellow or Golden Monitor Lizard (*Varanus flavescens*), Russell’s viper (*Daboia russelii*), Monocled cobra (*Naja kaouthia*) and Shikra (*Accipter badius*).

XVII. i. IMPACT OF PROJECT ACTIVITIES ON FLORA AND FAUNA

The developmental programs, policies and projects operated or managed by government or private bodies can cause potential significant changes in the physical, biological and socioeconomic environment. In some cases, the changes may be beneficial while in others it may be detrimental to the environment. Accordingly, environmental impacts studies are required for systematic identification, qualification and interpretation of the anticipated changes. The establishment and operation of this Plant can have impacts on the surrounding flora and fauna. These impacts include:

- Particulate matter and gaseous emissions from stack due to transportation activity & material handling may degrade the soil quality of surrounding environment that may affect the biodiversity of surrounding environment.
- Air and Noise Pollution may threaten and cause migration of wild animals and birds.
- Noise and vibrations generated by plant operations can disrupt wildlife behaviour and have negative effects on plant health.
- Fugitive emissions may impact the terrestrial flora. The settlement of dust on the laminar surface of plants can impede the efficiency of photo-transduction and thereby, affect the productivity of plants. In some of the plant, it may also smother the leaf surface blocking stomata, resulting in reduced transpiration.

ii. Relevant research on WCP Area

- a. Adhurya, S., Banerjee, S. and Chatterjee, A. (2016). *A Study of Avian Diversity in Durgapur Government College Campus, West Bengal, India. Holistic Approach to Environment, 6(3): 120–130.*
- b. Dey, S., Mukherjee, A. and Banerjee, S. (2017). *Habitat Preference and Diversity of Anurans in Durgapur, an Industrial City of West Bengal, India. Proceedings of the Zoological Society, 70(2): 141–150.*
- c. Chatterjee, A. and Banerjee, S. (2014). *Phyto-sociological Assessment of Vegetation of Durgapur Government College Campus, West Bengal. International Journal of Engineering Research and Applications, 3(6): 835–840.*
- d. *West Bengal Biodiversity Board (2016). People’s Biodiversity Register (PBR) – Durgapur Municipal Corporation Area. Government of West Bengal.*
- e. *Wildlife (Protection) Act, 1972 (as amended, 2022). Ministry of Environment, Forest and Climate Change, Government of India, New Delhi.*
- f. *Forest Survey of India (2023). India State of Forest Report 2023. Forest Survey of India, Ministry of Environment, Forest and Climate Change, Government of India, Dehradun.*

CHAPTER-II

A QUANTIFIABLE EXPLANATION OF THE EXPECTED IMPACT AS A RESULT OF THE PROJECT'S IMPLEMENTATION WILL BE GIVEN. THE PLAN SHOULD INCLUDE INFORMATION ON ANY QUALITATIVE CHANGES IN THE WILDLIFE HABITAT PATTERN IN THE WCP AREA AS RESULT OF PROJECT IMPLEMENTATION

Objective of the Wildlife Conservation Plan

Habitat Protection and Preservation: Identify and protect critical habitats for flora and fauna in the project area. Implement measures to avoid or minimize disturbance to these habitats during the project.

Biodiversity Conservation: Prioritize the conservation of plant and animal species, especially those endemic or endangered, by safeguarding their habitats and supporting their population.

Ecological Restoration: Develop plans for ecological restoration in areas affected by plant operation activities. Implement rehabilitation measures to restore habitats after plant activities are completed.

Habitat Connectivity: Establish wildlife corridors and connectivity to enable the movement and migration of species impacted. This helps maintain genetic diversity and healthy wildlife populations.

Species Management: Develop specific management plans for the protection and conservation of key wildlife species impacted by plant operation. Implement measures to support their survival and reproduction.

Environmental Impact Mitigation: Implement best practices to minimize environmental disturbances during construction and operation phases. Control noise, dust, and other pollutants to minimize impacts on wildlife.

Monitoring and Research: Conduct regular monitoring and research on wildlife populations to assess the effectiveness of conservation efforts and identify potential issues.

Community Engagement: Involve local communities and stakeholders in wildlife conservation efforts, raising awareness, providing training, and fostering community participation.

Compliance with Regulations: Ensure compliance with all relevant wildlife protection laws and regulations. Obtain necessary permits and approvals to safeguard wildlife and their habitats.

Sustainable Plant Practices: Promote and implement sustainable Plant practices to minimize the ecological footprint and preserve biodiversity.

Reclamation and Rehabilitation: Develop comprehensive reclamation and rehabilitation plans to restore the project areas, creating habitats suitable for wildlife.

Conservation Partnerships: Collaborate with conservation organizations and experts to develop and implement effective wildlife conservation strategies.

Environmental Education: Provide environmental education and training to the project's workforce and contractors to raise awareness about wildlife conservation.

Continual Improvement: Continuously review and assess the effectiveness of wildlife conservation measures, adjusting strategies as needed based on new knowledge and best practices.

By addressing these management objectives, the project aims to mitigate the impacts on wildlife, preserve biodiversity, and promote sustainable coexistence between the project and the natural environment.

IMPACTS IDENTIFICATION AND EVALUATION

The developmental programs, policies and projects operated or managed by government or private bodies can cause potential significant changes in the physical, biological and socio-economic environment. In some cases, the changes may be beneficial while in other it may be detrimental to the environment. Accordingly, environmental impacts studies are required for systematic identification, qualification and interpretation of the anticipated changes. The main environmental problems associated with project activities are land degradation (change in topography, soil erosion), visual intrusion, disturbance to hydrological system, odour, water, air and noise pollution which ultimately impact upon the floral and faunal status of the project area. However, occurrence and magnitude of these impacts are entirely depending on project location, mode of operation and adoption of latest technologies. Therefore, this study has been conducted to assess the impact of project activities and associated activities on the diversity and distribution of wildlife.

ANTICIPATED IMPACT ON THE ENVIRONMENT AND WILDLIFE

There are no direct or indirect evidence of presence of any wildlife in the core and buffer areas of the project. The wildlife movement and survival will not be affected through expansion activities as there is no National Park, Wildlife sanctuary, Biosphere reserves and only one protected forest within 10 km of the plant area. 16 schedule- I species were recorded in the core and buffer zone of plant area during the biodiversity assessment.

There may be an impact on the biological environment of the area due to operation of plant, if proper care will not be taken:

Particulate matter emissions and fugitive emissions due to transportation activity & material handling may impact the soil quality of surrounding environment that may affect the biodiversity of surrounding environment.

Fugitive emissions (dust) may impact the terrestrial flora. The settlement of dust on the laminar surface of plants can impede the efficiency of photosynthesis and thereby, affect the productivity of plants. In some of the plant, it may also smother the leaf surface blocking stomata, resulting in reduced transpiration

1.3 MITIGATION AND CONSERVATION MEASURES:

The plant will have no significant impact on surrounding ecology and biodiversity as following mitigation measures will be adopted:

- Development of around 40% greenbelt and plantation in and outside the plant site to provide a hindrance to dust particles dispersing outside plant premises and in surroundings.
- Using paved/concrete roads for transportation to minimize fugitive emissions.

- Transporting material in covered/closed truck and storing it under covered facilities.
- Regular sprinkling of water in dust generating areas.
- Proper maintenance and regular water sprinkling on tress to wash off dust particles or metal dust.
- Transport vehicles and machinery will be properly maintained and periodically checked for pollution level to reduce noise and gaseous emission in the surrounding environment

1.4 QUALITATIVE CHANGES

There have been no significant qualitative changes in the wildlife habitat patterns within the WCP area. This is primarily because there are no National Parks, Wildlife Sanctuaries, Biosphere Reserves, migratory corridors for wildlife, Ramsar Sites, or Tiger/Elephant Reserves (either existing or proposed) within a 10 km radius of the plant site. There are no notified Elephant Corridors within the 10 km radius of the plant area, as per the MoEF&CC, Elephant Corridors Report- 2023, Government of India. However, elephant movement has been reported/observed within the 10 km radius of the plant area.

Issues		Reason/Status in relation to project site	Suggestions	Reference/Method
Species	Rare/ Endangered/ Threatened species	There are no Rare/ Endangered/ Threatened species are given in the list of flora. There are only two near threatened species. Proper mitigation plans have been prepared for all these species and have been incorporated into this Wildlife Conservation Plan (WCP).	Species-specific conservation plan and Habitat improvement plan has been prepared along with cost implications for conservation activities	Field observation, interview of local biologists and people. Information available in public domain, IUCN and BNHS Check list and Forest Working Plan of (WL) Division
	Endemic Species	No endemic species of any flora, fauna or wildlife present in the study area	There are no endemic species of any flora, fauna or wildlife present in the study area	Field survey, Literature review
Important Natural Habitats	Protected Areas	No National Park, Wildlife Sanctuary, Tiger/ Elephant Reserve and Biosphere Reserve falls in the 10-km radius study area	There are no National Park, Wildlife Sanctuary, Tiger/ Elephant Reserve and Biosphere Reserve falls in the 10-km radius study area	ENVIS Centre on Wildlife and Protected Areas, Government of West Bengal, India protected area website, Google Earth, Project Maps etc.
	Important Bird Areas	No Important bird areas are falling in the 10-km radius area for migratory bird habitat. Only Durgapur Barrage serves as a significant habitat for various water birds and migratory birds.	Durgapur Barrage will be protected by controlling habitat degradation and waste reduction. No other major bird habitat areas. Proper mitigation measures will be followed as per Environment Management Plan.	ENVIS Centre on Wildlife and Protected Areas, Important Bird Area in India, IBA Book (Birdlife International).
	Ramsar site	No Ramsar sites present in present in 10 km periphery from the project site.	There are no Ramsar sites present in present in 10 km periphery from the project site.	Ramsar Website / ENVIS Centre on Wildlife and Protected Areas
	Wetlands of National Importance	No Wetlands of national importance present in 10 km periphery from the project site.	There are no notified Wetlands of national importance present in 10 km periphery from the project site.	ENVIS Centre on Wildlife and Protected Areas, Wetlands directory of Government of India.
	Wetlands of international Importance	No Wetlands of international importance Present in 10 km periphery of the project site.	There are no Wetlands of international importance Present in 10 km periphery of the project site.	Liet al. 2009 "Status of water birds in Asia". Wetlands International Publication.
Wildlife Corridors	No notified Wildlife corridors are present in 10km radius of study area. There are no notified Elephant Corridors within the 10 km radius of the plant area, as per the MoEF&CC, Elephant Corridors Report- 2023, Government of India. However, elephant movement has been reported/observed within the 10 km radius of the plant area near Beliatore forest and parts of Barjora forest.	Some mitigation measures: <ul style="list-style-type: none"> • No obstruction to natural drainage lines, forest paths, or low-lying areas that may be used by elephants. • Maintenance of green buffer along the plant boundary using native species. • Speed restriction and cautionary signage on internal and approach roads near forest areas. • Regulation of night-time vehicle movement and avoidance of unnecessary noise. • Use of low-intensity, downward-directed lighting to minimize disturbance to wildlife. • Strict management of solid waste and prohibition of food waste dumping. • Coordination with local Forest Department and compliance with advisories during elephant movement periods. 	ENVIS Centre on Wildlife and Protected Areas, Consultation with local naturalists and Forest officials (DFO).	

Issues	Reason/Status in relation to project site	Suggestions	Reference/Method
		<ul style="list-style-type: none"> Awareness training for workers on safe practices during elephant sightings. 	
Eco-sensitive zone/Eco-Sensitive Area identified by government	No Eco-sensitive zone/Eco-Sensitive Area are present in 10km radius of study area.	There are No Eco-sensitive zone/Eco-Sensitive Area are present in 10 km radius of study area.	ENVIS Centre on Wildlife and Protected Areas, Consultation with local naturalists and NGOs
Forest Areas	Durgapur PF (~4.8 km in North East Direction from plant site) and Beliatare RF (~9.0 km in South West direction from plant site).	The project has thick canopied green belt and plantations inside the plant site and periphery for control of pollutants	Forest Working Plan of Forest Division, West Bengal department website, Forest area KML file, Consultation with Local Forest officials and Forest Area Map/
Water bodies	<ul style="list-style-type: none"> Kunur Nala (~8.5 km in NNE direction from Plant site) Tamla Nala (~5.0 km in NW direction from Plant site) Damodar River (~2.5 km in SSW direction from Plant site) Barjora Nala (~5.30 km in WSW direction from Plant site) Tartari Nala (~8.20 km in WSW direction from Plant site) DVC Canal (~0.5 km in South) Damodar Branch Canal (~6.0 km in East) 	No waste water will be discharged outside the plant. Adequate measures will be taken for protection and conservation of Water.	Project map and local maps, Google Earth
Breeding/ Nesting areas	There are no breeding/nesting sites are falling in study area. Durgapur Barrage is a water bird habitat.	NIL For Durga Barrage- <ul style="list-style-type: none"> No discharge of untreated effluent or solid waste into the river/barrage area. Control of noise and use of low-intensity, downward-directed lighting near the water body. Avoidance of high-disturbance activities during early morning and evening bird activity periods. Protection of riparian vegetation and prohibition of disturbance to water birds by project personnel. 	Literature Survey, E-Birds, Project Map and local maps, Google Earth

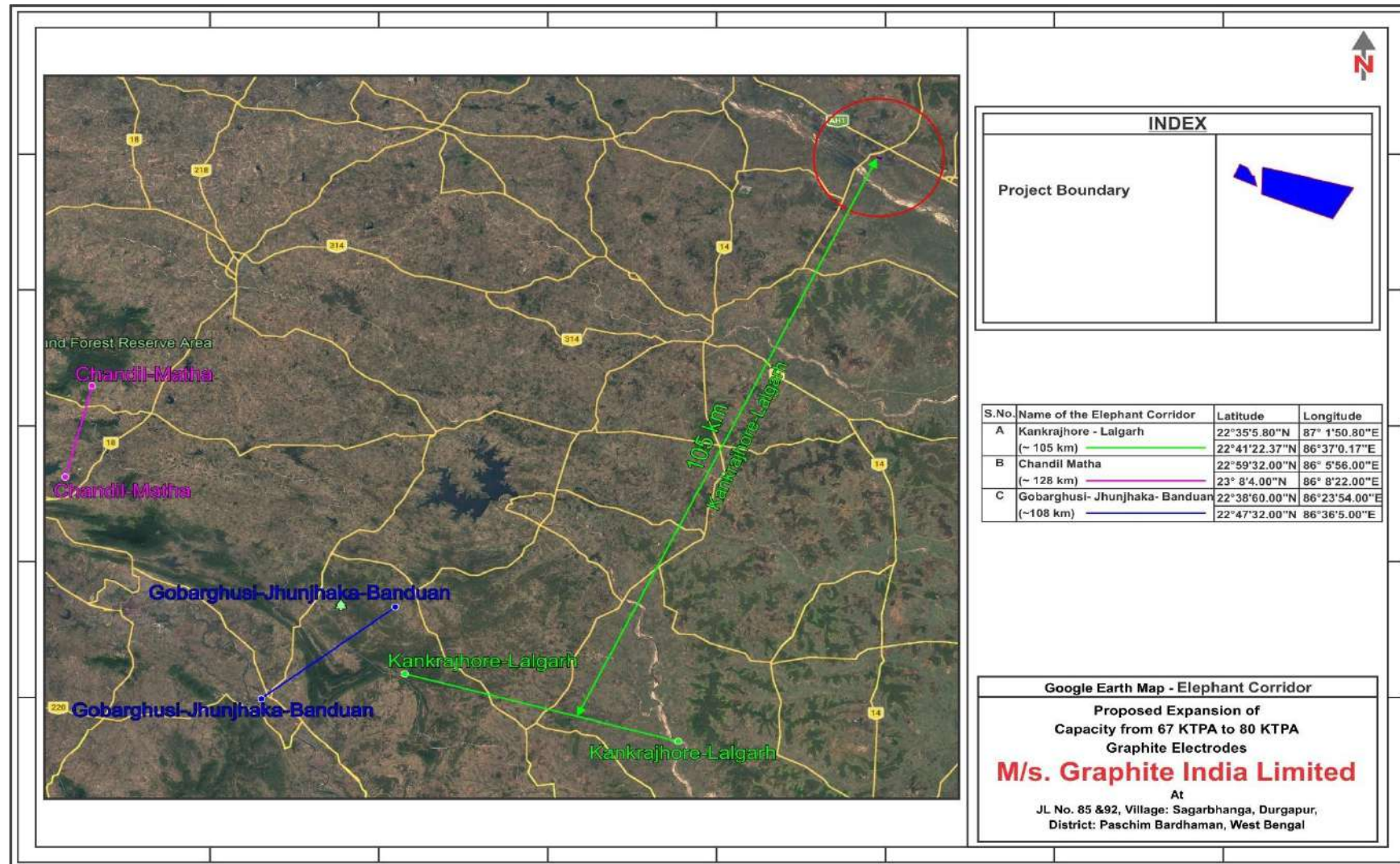


Fig 8: Map showing Nearest Notified Elephant Corridors according to Elephant Corridors Report- 2023, Government of India from the Plant site

1.5 DETAILS OF SCHEDULE-I SPECIES FOUND IN 10 KM RADIUS OF PLANT AREA

1. Bengal Fox

Scientific Name: *Vulpes bengalensis*

Distribution and Habitat Indian Fox range is bounded by the Himalayas and the Indus River valley. It favors semiarid, flat to undulating land, bush and short grassland habitats. It avoids dense forests, steep terrain, tall grasslands and true deserts. It is relatively widespread in low rainfall areas where the vegetation is usually scrub, thorn or dry deciduous forests, or short grasslands. In the Indian peninsula, the species is confined to plains and open scrub forests. It was considered to be a habitat generalist, but it shows a strong preference for semiarid, short grassland habitats at multiple scales

Ecology and Behaviour: Bengal foxes are predominantly crepuscular and nocturnal; while individuals may sometimes become active during cool periods of daytime, they typically spend warmer daylight hours under vegetation or in subterranean dens. They use three distinct types of dens: basic, compact dens with two openings used for short rest periods, complex dens with multiple openings, and dens under rocks or rock crevices. The basic social unit of the Bengal Fox is the breeding pair, formed by a pair of bonds that can last for many years. Larger aggregations may occur while grown pups linger longer than average in the natal community. Other findings indicate that Bengal foxes can sometimes be more social. Female Bengal foxes were reported to share dens during lactation and four adult foxes were seen emerging from the same den. Bengal foxes are not especially suspicious of humans and can be found near human habitation. They are easy to tame.

Breeding: Bengal foxes are thought to form long-term monogamous pairs, but this supposition is based on scarce evidence and extra-pair copulations are known to occur. During the breeding season, males vocalize intensely during the night and at dusk and dawn. Throughout most of its range, the mating season occurs in December to January and after a gestation period of around 50–53 days, two to four pups are born in a den. Both parents participate in pup-rearing and protection. Aggregations of grown foxes at den sites have been recorded when the dispersal has been delayed, although the presence of helpers has not been observed. Pups may sometimes be nursed by multiple females, but the relationship between them is uncertain. During the day, they tend to rest under shrubs and bushes, except in summer when they rest in dens. Play between pups is typical during the first 3 months and consists of vertical jumps, back arching, foreleg stabs, submissive displays, and play solicitation; the adult male sometimes plays with the young. In northwestern India, young foxes are scattered during the monsoon season, when the opportunities are plentiful. The pups are fully weaned about 3–4 months after emerging from the den. Pup mortality is high during the first few months.

Threats: While the Bengal fox is common, it usually occurs at low densities across its range, and populations may experience significant fluctuations due to prey abundance and disease (canine distemper virus and rabies, which have been confirmed to cause local population declines in western India). Any human disruptions can be tolerated, but with the increase of human populations and the

increased growth of grasslands for agricultural and industrial use, the habitat of the Bengal fox is continually being reduced. The combination of the above causes, combined with disease and/or natural mortality, could potentially cause localized extirpation. Lack of habitat protection is perhaps the greatest threat to the Bengal fox

Conservation Status: The species is currently listed as “least concern” in IUCN red list of threatened species. A conservation plan for the Bengal fox (*Vulpes bengalensis*) includes habitat protection, anti-poaching measures, disease management, and community education. The Bengal fox is listed in Schedule I of the Indian Wildlife (Protection) Act, 1972 and as amended in 2022, which prohibits hunting of all wildlife.

Habitat protection

- Protected areas: Maintain habitats by establishing wildlife corridors and protected areas
- Sustainable land use: Practice sustainable land use to maintain habitats
- Grassland management: Manage grasslands to maintain open habitats that benefit foxes

Anti-poaching measures

- **Increase patrols**
Increase patrols and law enforcement to reduce the impact of illegal wildlife trade
- **Collaborate**
Collaborate with local communities and conservation organizations to combat poaching

Disease management

- **Monitor health:** Monitor the health of Bengal fox populations
- **Implement vaccination programs:** Implement vaccination programs to prevent disease transmission

2. Common Pea Fowl

Scientific Name: *Pavo cristatus*

Distribution and Habitat: The Indian peafowl is a resident breeder in the Indian subcontinent and is found across most of India and Sri Lanka. In India, it is found across the country from the Indus valley in the north-west to Assam in the north-east, and from Himalayas in the north to the southern tip, except for the marshlands of Sunderbans in East India. In India, it is found up to elevations of 5,000 ft (1,500 m) in the north and upto 6,000 ft (1,800 m) in the mountains of the south. In Sri Lanka, it largely inhabits the drier lowland areas. It is generally found in forests, small hills, and bushy areas near water sources. It also occupies cultivable lands and live in a semi-domesticated state in human habitations.

Ecology and Behaviour: The Indian peafowl forages on the ground in small groups, known as musters, that usually have a single peacock and three to five peahens. After the breeding season, the flocks tend to be made up only of females and young. It is found in the open early in the mornings and tends to rest under cover during the heat of the day. It is often sighted dust-bathing at dusk. It roosts

on tall trees at night, but may sometimes make use of rocks or buildings. Birds usually arrive at their roosting sites during the dusk and call frequently before taking their positions. Despite its size, the Indian peafowl is capable of flight. However, it rarely flies and often escapes by running on foot through the undergrowth when perturbed or disturbed. When it takes off, it uses regular, slower flaps to maintain flight rather than gliding.

Breeding: Indian peacocks are polygamous. The peafowl usually reaches sexual maturity at the age of two to three years old. The breeding season may be spread out over the entire year and is more common during the monsoon months of June to August. Several males may congregate at a lek site and these males are often closely related. Males at leks maintain small territories next to each other and allow females to visit them. Males make no attempt to guard harems and females do not favour specific males. The nests are usually shallow hollow scrapes on the ground lined with leaves, sticks and other debris. The peafowl might also nest on crevices in the buildings, and disused nests of vultures. The female lays a clutch of three to eight oval shaped eggs. The eggs measure about 2.45–3 in (6.2–7.6 cm) in length and 1.42–2.2 in (3.6–5.6 cm) in width. They appear polished and have thick shells with pits and pores. The color varies from pale white to buff or reddish-brown. The males take no part in hatching or rearing the young.

Threats: Poaching of peacocks for their meat and feathers and accidental poisoning by feeding on pesticide treated seeds are known threats to wild birds. It is also hunted in some areas for usage in folk remedies.

Conservation measures: IUCN Status includes “Least Concern.” Conservation measures include:

- Habitat improvement: Plant trees and shrubs that provide shelter, food, and roosting areas for peacocks. These can include local species like neem, jamun, shesham, and pipal.
- Awareness programs: Educate communities and schools about peafowl conservation. These programs can include competitions during Wildlife Week and Van Mahotsav.
- Veterinary care: Provide care for injured, sick, or deformed peacocks.
- Reward informers: Offer rewards to people who report poaching or illegal wildlife trade.
- Protect from predators: Protect peacocks and their eggs from predators like wild dogs.
- Encourage afforestation: Encourage afforestation activities near peafowl habitats.
- Provide drinking water: Encourage villagers to provide water for peacocks to drink in the summer.

3. Small India Civet

Scientific Name: *Viverricula indica*

Distribution and Habitat: The Small Indian Civet has a wide distribution across India, Sri Lanka, Myanmar, Thailand, Laos, Cambodia, Vietnam, and south and central China. While historically present in Bhutan, Bangladesh, Peninsular Malaysia, Java, and Bali, its current status in these areas is less clear, and it has been introduced to Madagascar. This species exhibits remarkable adaptability,

inhabiting a diverse range of environments including grasslands, riverine areas, semi-evergreen and deciduous forests, bamboo forests, scrubland, and even agricultural fields and human-disturbed areas like tea plantations and suburban environments. They often utilize holes in the ground, under rocks, or in thick bushes for shelter, and in urban settings, they may even use gutters or other dark, hollow spaces.

Ecology and Behaviour: Primarily nocturnal, the Small Indian Civet is largely terrestrial but is also adept at climbing. They are generally solitary animals, though pairs may form during mating and occasionally for hunting. While predominantly insectivorous, their diet is opportunistic and varied, including rats, mice, birds, snakes, fruit, roots, and carrion. They are also known to sometimes prey on poultry. Communication largely relies on scent marking, especially to establish territorial boundaries. When threatened, their primary response is to flee and hide, leveraging their speed, climbing ability, and camouflage. If cornered, they will defend themselves with bites and claws.

Breeding: The breeding patterns of Small Indian Civets can vary geographically. In some regions, breeding occurs year-round, while in others it may be seasonal. Captive observations in Kerala, India, suggest mating periods in March to May and October to December, with a gestation period of approximately 65 to 69 days. Females typically give birth to a litter of four to five young. Kittens are born weighing around 90-110g and open their eyes after about five days, reaching 1kg by ten weeks of age. In captivity, their lifespan is typically eight to nine years.

Threats: Despite being listed as "Least Concern" by the IUCN Red List due to its widespread distribution and adaptability, the Small Indian Civet faces several threats, particularly in parts of its range where populations are declining. Habitat loss and fragmentation, driven by deforestation, urbanization, and agricultural expansion, pose a significant risk. Hunting and trapping are also major concerns, as these civets are targeted for their meat, fur, and especially for their perineal gland secretion (civet musk), which is used in perfumes and traditional medicine. Road accidents are another cause of mortality, particularly as their habitats are disturbed and they venture into human-dominated areas. They are sometimes considered pests by farmers due to occasional predation on poultry

Conservation Measures: Conservation efforts for the Small Indian Civet focus on a multi-pronged approach. Protecting and restoring their diverse habitats, including forests, grasslands, and riparian areas, is crucial for maintaining viable populations. Effective law enforcement is necessary to curb illegal hunting and trade of civets and their products. Raising public awareness about the importance of civet conservation and their ecological role can help reduce demand for their exploitation. Furthermore, research into their ecology, population status, and specific threats can inform and guide more targeted conservation strategies. While not a primary conservation method for this "Least Concern" species, captive breeding and reintroduction programs could be considered if populations

face more severe declines in specific regions. The species is also listed on CITES Appendix III and is totally protected under Schedule 1 of Wildlife Conservation Plan, 1972 and as amended in 2022.

4. Dhaman or Common Rat Snake

Scientific Name: *Ptyas mucosus*

Distribution and Habitat: The Common Rat Snake, or Dhaman, has an extensive range across South and Southeast Asia, including India, Sri Lanka, Pakistan, Bangladesh, Nepal, Bhutan, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, southern China, Taiwan, and Indonesia (Sumatra, Java, Bali, Kalimantan). This highly adaptable species can be found in a variety of habitats, ranging from dense forests to agricultural lands, human settlements, and even urban environments. They thrive in areas with good cover and access to water, such as farmlands, scrublands, rice paddies, gardens, and urban outskirts. They are often found near human dwellings due to the abundance of rodents, their primary prey.

Ecology and Behaviour: *Ptyas mucosus* is a diurnal (active during the day) and semi-arboreal snake, meaning it can climb trees and bushes but spends much of its time on the ground. They are known for their speed and agility, allowing them to quickly pursue prey and escape predators. While generally shy, they can become aggressive and deliver a painful bite if cornered or provoked, though they are not venomous. When threatened, they may inflate their neck, hiss loudly, and strike repeatedly. Their diet primarily consists of rodents, including rats and mice, making them beneficial in controlling pest populations. They also prey on birds, lizards, frogs, and occasionally other snakes. They typically hunt by actively searching for prey rather than ambushing.

Breeding: The breeding season for Common Rat Snakes usually occurs between April and July. Females lay clutches of 6 to 18 elongated eggs, often in secluded, warm, and humid locations such as decaying logs, leaf litter, or burrows. The eggs typically hatch after an incubation period of approximately 60 to 90 days. The hatchlings are independent from birth and measure around 30-40 cm in length. Sexual maturity is usually reached within 2-3 years, and in the wild, Common Rat Snakes can live for more than 10 years, with some individuals in captivity exceeding 15 years.

Threats: Despite its wide distribution and adaptability, the Common Rat Snake faces several threats. Habitat loss and fragmentation due to urbanization, agricultural expansion, and deforestation are significant concerns, reducing their available living space and prey. They are often persecuted and killed by humans due to mistaken identity with venomous snakes, or simply out of fear or superstition. Road accidents are another common cause of mortality, particularly in areas with high traffic density. In some regions, they are exploited for their skin in the leather industry or captured for the illegal pet trade.

Conservation Measures: Conservation efforts for the Common Rat Snake primarily focus on mitigating human-wildlife conflict and promoting coexistence. Educating the public about the non-venomous nature of these snakes and their ecological benefits (e.g., rodent control) can help reduce unnecessary killings. Protecting and restoring their diverse habitats, especially green spaces within urban and agricultural landscapes, is vital. Implementing measures to reduce road fatalities, such as underpasses or warning signs in high-risk areas, can also contribute. While not listed as threatened globally, local populations may benefit from specific conservation initiatives, including rescue and rehabilitation of displaced individuals. Legal protection against hunting and trade in areas where it occurs is also important.

5. Cotton Teal or Cotton Pygmy Goose

Scientific Name: *Nettapus coromandelianus*

Distribution and Habitat: The Cotton Teal has a wide distribution across tropical and subtropical Asia, ranging from Pakistan and India through Southeast Asia to southern China, and even parts of Australia. In India, it is a common resident across most of the country, though its presence can be localized based on suitable wetland habitats. This species primarily inhabits freshwater wetlands, including lakes, ponds, swamps, jheels, reservoirs, and slow-moving rivers. They show a strong preference for wetlands with abundant aquatic vegetation, such as water lilies and lotus, as these provide both food and cover. They can also be found in flooded rice fields and other agricultural landscapes that offer suitable water bodies.

Ecology and Behaviour: The Cotton Teal is the smallest waterfowl species in Asia and exhibits a predominantly diurnal (daytime) activity pattern. They are highly agile on water, diving skilfully to forage, and are also adept flyers. While often seen in pairs or small family groups, they can congregate in larger flocks during the non-breeding season or at favoured foraging sites. Their diet consists mainly of aquatic vegetation, including seeds, roots, and leaves of water plants. They also consume aquatic insects, small crustaceans, and other invertebrates. They are generally shy birds and will often seek refuge amongst dense aquatic vegetation when disturbed. Their calls are distinctive, often described as a short, soft whistle.

Breeding: The breeding season for Cotton Teals typically coincides with the monsoon season, generally from July to September in India, though it can vary regionally. They nest in tree hollows, often those created by woodpeckers or other birds, or sometimes in old buildings near water bodies. Unlike many ducks, they do not build an elaborate nest structure, often simply laying their eggs on the existing debris within the hollow. Females lay a clutch of 6 to 15 creamy-white eggs. Both parents are involved in incubating the eggs, which hatch after approximately 21 to 23 days. The precocial ducklings are able to leave the nest shortly after hatching and are guided by their parents to the water, where they can feed themselves.

Threats: Despite its wide range, the Cotton Teal faces several threats, primarily due to the degradation and loss of its wetland habitats. Drainage of wetlands for agriculture, urbanization, and industrial development is a major concern. Pollution of water bodies from pesticides, industrial effluents, and domestic waste also negatively impacts their food sources and overall health. Over-hunting, though less prevalent in some areas now, has historically been a threat and can still occur in certain regions. Disturbance from human activities, such as boating and unregulated tourism, can also impact their breeding and foraging success.

Conservation Measures: Conservation efforts for the Cotton Teal primarily focus on the protection and restoration of its vital wetland habitats. Designating and effectively managing protected wetland areas, such as bird sanctuaries and Ramsar sites, is crucial. Measures to control pollution in water bodies, through proper waste management and regulation of agricultural runoff, are essential for maintaining healthy ecosystems. Raising awareness among local communities about the importance of wetlands and the role of birds like the Cotton Teal can foster greater conservation support. While generally widespread, monitoring population trends and conducting research into specific regional threats can inform more targeted conservation strategies. Legal protection against hunting is also in place in many parts of its range.

6. Golden Jackal

Scientific Name: *Canis aureus*

Distribution and Habitat: The Golden Jackal has a wide distribution across North and East Africa, Southeastern and Central Europe, the Middle East, and South and Southeast Asia. In India, it is one of the most common wild canids, found across diverse habitats ranging from forests, scrublands, grasslands, wetlands, agricultural landscapes, and even the fringes of villages and towns. They are highly adaptable and can thrive in both arid regions and moist areas, though they tend to avoid dense forests and high mountains. Their presence is often closely linked to availability of food and water sources.

Ecology and Behaviour: Golden Jackals are medium-sized canids known for their adaptability and opportunistic feeding habits. They are primarily crepuscular and nocturnal, being most active during dawn, dusk, and night, though they may also forage during the day in undisturbed areas. They are omnivorous, feeding on a wide variety of food items including small mammals, birds, reptiles, amphibians, fruits, grains, carrion, and human-generated waste. They usually live in monogamous pairs or small family groups but may form larger packs where food is abundant. Jackals communicate through a wide range of vocalizations, including their characteristic high-pitched howls, which are used for territorial defense and group cohesion. They play an important ecological role as scavengers, helping in the natural disposal of carcasses.

Breeding: Breeding season varies with region but in India usually occurs from October to March. Jackals are monogamous, and pairs often remain together for life. They typically den in burrows, rock crevices, hollow logs, or abandoned porcupine or fox dens. The female gives birth to a litter of 3 to 6 pups after a gestation period of around 60 to 63 days. Both parents, and sometimes older siblings, participate in feeding and caring for the pups. The young are weaned after about 8 weeks and begin to accompany the parents on hunts as they grow.

Threats: Golden Jackals, though widespread, face several threats primarily from human activities. Habitat loss due to urbanization, agriculture, and deforestation reduces their natural range. Persecution by humans, including poisoning and hunting, often occurs as they are sometimes seen as pests or livestock predators. Road kills are also a significant cause of mortality, particularly in areas near human settlements. Competition with stray and feral dogs, as well as the risk of disease transmission (such as rabies and canine distemper), poses additional challenges to jackal populations.

Conservation Measures: Conservation measures include habitat preservation, reducing human-wildlife conflict, and implementing awareness programs among local communities about the ecological role of jackals. Proper management of garbage and waste near human settlements can help minimize conflicts. Monitoring population status, studying disease prevalence, and protecting connected habitats and corridors are important for their long-term survival. Globally, the species is listed as Least Concern (LC) by the IUCN due to its wide distribution and adaptability, though localized declines exist in some regions.

7. Indian Grey Wolf

Scientific Name: *Canis lupus pallipes*

Distribution and Habitat: The Indian Grey Wolf is a subspecies of the Grey Wolf found in the Indian subcontinent and parts of the Middle East. In India, it is widely distributed across the Deccan Plateau, semi-arid regions of Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, and parts of Uttar Pradesh and Bihar. It avoids dense forests and prefers open grasslands, scrublands, semi-arid plains, agricultural fields, and wastelands. Wolves are highly territorial and require large home ranges, often spanning 150–200 km², depending on prey availability.

Ecology and Behaviour: The Indian Grey Wolf is a social carnivore living in packs, usually consisting of a breeding pair and their offspring. Pack size can range from 4 to 8 individuals, though larger packs may form in prey-rich areas. They are primarily crepuscular and nocturnal hunters, preying on medium-sized ungulates such as blackbuck, chinkara, nilgai calves, and livestock in human-dominated landscapes. Their diet also includes hares, rodents, birds, and occasionally fruits. They are skilled hunters, often using cooperative strategies. Vocal communication, including howling,

is a key part of pack coordination and territorial defence. Wolves play an important ecological role as apex predators, maintaining prey populations and ecosystem balance.

Breeding: The breeding season in India usually occurs between October and January. Wolves are monogamous, and the breeding pair often bonds for life. The female gives birth in a den located in rock crevices, caves, or burrows. After a gestation period of about 60–63 days, a litter of 4 to 7 pups is born. Both parents, and sometimes older siblings, help feed and protect the young. The pups are weaned after about 6–8 weeks but remain dependent on the pack until they disperse at around 1–2 years of age.

Threats: The Indian Grey Wolf faces numerous threats, primarily from habitat loss and fragmentation due to agricultural expansion, infrastructure development, and deforestation. Human-wolf conflict is common, as wolves often prey on livestock, leading to retaliatory killings by poisoning or hunting. Declining populations of wild prey also force wolves to depend more on domestic animals. Road mortality, competition with feral dogs, and disease transmission (rabies, canine distemper) further threaten their survival.

Conservation Measures: Globally, *Canis lupus* is listed as Least Concern (LC) by the IUCN, but the Indian Grey Wolf population is considered vulnerable due to its declining numbers and fragmented distribution. Conservation efforts focus on habitat protection, reducing livestock depredation through community-based programs, and creating awareness about the ecological role of wolves. Initiatives like compensation schemes for livestock losses, community participation in conservation, and safeguarding grasslands and scrublands are crucial for their long-term survival.

8. Jungle Cat

Scientific Name: *Felis chaus*

Distribution and Habitat: The Jungle Cat is widely distributed across South and Southeast Asia, the Middle East, and parts of Egypt. In India, it is one of the most common small wild cats, found in a wide range of habitats including scrublands, grasslands, wetlands, reed beds, agricultural fields, forest edges, and near human settlements. They show a strong preference for areas with dense vegetation near water bodies such as rivers, lakes, and marshes. Unlike many other wild cats, they avoid dense evergreen forests and extremely arid deserts.

Ecology and Behaviour: Jungle Cats are solitary and territorial, with males having larger ranges than females. They are primarily crepuscular and nocturnal, though they can also be active during the day in undisturbed areas. Their diet mainly consists of rodents, hares, small birds, reptiles, amphibians, fish, and insects, making them important controllers of rodent populations in agricultural landscapes. They are skilled hunters and use a combination of stalking and pouncing techniques. Jungle Cats are

strong swimmers and often enter water to catch prey. They communicate through scent marking, body postures, and a variety of vocalizations including growls and meows.

Breeding: The breeding season varies regionally, but in India, it typically occurs from October to March. After a gestation period of around 63–66 days, the female gives birth to 2–4 kittens in a concealed location such as dense grass, hollow logs, or abandoned burrows. The kittens are weaned after about 2 months and begin hunting small prey by 3–4 months of age. They become independent at 8–9 months, though dispersal depends on territory availability.

Threats: Jungle Cats face several threats primarily due to human activities. Habitat destruction and fragmentation from agriculture, urbanization, and industrial expansion reduce their natural range. Wetland drainage and loss of reed beds also significantly affect their populations. They are frequently killed in retaliation for poultry depredation or mistakenly persecuted as pests. Road kills and accidental trapping are additional threats. Hybridization with domestic cats and transmission of diseases like feline distemper and rabies pose further risks to wild populations.

Conservation Measures: Globally, it is classified as Least Concern (LC) on the IUCN Red List due to its wide distribution, though populations are declining in several regions. Conservation measures focus on wetland and grassland protection, reducing human-wildlife conflict, and raising awareness about the species' ecological importance. Monitoring populations and mitigating threats from hybridization and diseases are essential for long-term conservation.

9. Indian Grey Mongoose

Scientific Name: *Urva edwardsii* (formerly *Herpestes edwardsii*)

Distribution and Habitat: The Indian Grey Mongoose is widely distributed across the Indian subcontinent, including India, Pakistan, Nepal, Bangladesh, and Sri Lanka. It is also found in parts of the Middle East such as Iran, Iraq, and Saudi Arabia. Within India, it is common in diverse habitats, ranging from scrublands, grasslands, forests, agricultural areas, and village outskirts to semi-arid and rocky regions. It shows a strong adaptability to human-modified landscapes and is often seen near fields, houses, and even roadsides.

Ecology and Behaviour: The Indian Grey Mongoose is a small, agile, and solitary carnivore, although it may sometimes be seen in pairs or small family groups. It is primarily diurnal, being active during the day, especially early morning and late afternoon. Its diet is omnivorous but predominantly carnivorous, feeding on rodents, reptiles (including snakes), insects, eggs, amphibians, and occasionally fruits and roots. They are famous for their ability to hunt and kill venomous snakes, thanks to their agility, thick fur, and partial resistance to venom. Mongooses are bold animals, known for their curious nature and rapid movements. They play an important ecological role in controlling rodent and reptile populations.

Breeding: Breeding in the Indian Grey Mongoose can occur year-round, but peaks are often observed around March–October. The female gives birth in dens, burrows, hollow logs, or rock crevices. After a gestation period of about 50–60 days, the female produces a litter of 2–4 young. The offspring are weaned after about 6–8 weeks and remain dependent for several months before becoming independent. Parental care is mainly provided by the mother.

Threats: Though adaptable, Indian Grey Mongooses face threats from habitat loss, fragmentation due to urbanization, and persecution by humans. They are sometimes killed as poultry predators or in retaliation. Road mortality is common due to their diurnal activity. A major threat historically and currently has been poaching for their hair, which is used in making paintbrushes and shaving brushes. This exploitation has contributed to local population declines.

Conservation Measures: The species is listed as Least Concern (LC) by the IUCN Red List due to its wide distribution and adaptability, although local declines occur where hunting pressure is high. Conservation actions include stricter enforcement of anti-poaching laws, awareness campaigns to reduce exploitation, and habitat conservation in agricultural and semi-natural landscapes.

10. Striped Hyena

Scientific Name: *Hyaena hyaena*

Distribution and Habitat: The Striped Hyena is distributed across North and East Africa, the Middle East, Central Asia, and the Indian subcontinent. In India, it is found in arid and semi-arid regions, rocky terrain, scrub forests, dry grasslands, and forest edges. They are most common in states like Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, and parts of the Deccan Plateau. They avoid dense forests and very humid regions, showing a preference for dry habitats with sparse vegetation and availability of caves or burrows for denning.

Ecology and Behaviour: Striped Hyenas are solitary or live in small family groups, unlike their spotted hyena relatives. They are primarily nocturnal, foraging at night and resting during the day in dens, caves, or rock crevices. As scavengers, they play a critical ecological role by consuming carcasses, bones, and other organic waste, thereby keeping ecosystems clean. They are opportunistic feeders and may also consume fruits, insects, small mammals, and livestock remains. Despite their somewhat intimidating appearance, they are shy animals and avoid direct conflict with humans whenever possible. Their characteristic habit of raising their mane when threatened gives them a larger, more fearsome appearance. Communication includes growls, whoops, and scent marking.

Breeding: The breeding season varies regionally but in India it can occur throughout the year, with peaks often reported during winter and early summer. Striped Hyenas are monogamous, and both parents take part in raising the young. After a gestation period of 90–92 days, the female gives birth to 2–4 cubs inside a secure den. Cubs are nursed for about 8 weeks before being introduced to solid

food, and they remain dependent on the parents for several months. The cubs reach maturity at 2–3 years of age.

Threats: Striped Hyenas face numerous threats across their range. Habitat loss due to agriculture, urbanization, and infrastructure development reduces their denning and foraging areas. Human-wildlife conflict is common, as they are often blamed for livestock predation, though they largely scavenge rather than hunt. They are persecuted through poisoning, hunting, and trapping. Road kills are another significant cause of mortality. Illegal poaching for body parts, used in traditional medicine and rituals, also poses a threat. Decline in natural prey and carcass availability due to changing pastoral practices has further affected populations.

Conservation Measures: Globally, it is listed as Near Threatened (NT) on the IUCN Red List due to declining populations. Conservation measures include habitat protection, mitigation of human-wildlife conflict through awareness campaigns, ensuring proper disposal of carcasses to reduce poisoning incidents, and community participation in conservation. Research and monitoring of population trends are needed to better protect this species.

11. Asian Elephant

Scientific Name: *Elephas maximus*

Distribution and Habitat: The Asian Elephant is distributed across South and Southeast Asia, including India, Sri Lanka, Nepal, Bhutan, Bangladesh, Myanmar, Thailand, Laos, Cambodia, Vietnam, Malaysia, and parts of Indonesia. In India, it occurs in fragmented populations across the Western Ghats, Eastern Ghats, Central India, North-Eastern India, and the Himalayan foothills. Major elephant-bearing states include Karnataka, Kerala, Tamil Nadu, Assam, Odisha, Jharkhand, Chhattisgarh, West Bengal, and Uttarakhand. Asian Elephants inhabit a wide range of habitats such as tropical moist and dry deciduous forests, semi-evergreen forests, grasslands, riverine forests, and forest–agriculture mosaics. They require large home ranges with access to water, fodder, and traditional migratory corridors, and are highly sensitive to habitat fragmentation.

Ecology and Behaviour: Asian Elephants are highly social and intelligent mammals, typically living in matriarchal herds consisting of related females and their offspring, while adult males are largely solitary or form temporary bachelor groups. They are mostly crepuscular to nocturnal in areas with human disturbance, though they may be active during the day in undisturbed habitats. Elephants are mega-herbivores, consuming a wide variety of vegetation including grasses, leaves, bark, fruits, and crops, with an average daily intake of 150–300 kg of food and large quantities of water. They play a vital ecological role as keystone species by shaping forest structure, dispersing seeds, and creating habitats for other organisms. Communication occurs through vocalizations, body language, and low-frequency infrasonic calls that travel long distances.

Threats: The Asian Elephant faces severe threats across its range, primarily due to habitat loss and fragmentation caused by agriculture expansion, mining, infrastructure development, and urbanization. Disruption of traditional migratory corridors has intensified human–elephant conflict, leading to crop damage, property loss, and human as well as elephant fatalities. Electrocutation, train collisions, road kills, and accidental poisoning are significant causes of mortality. Illegal poaching for ivory, though reduced compared to African elephants, still poses a threat, particularly to male elephants. Climate change and declining availability of water and fodder further exacerbate stress on populations.

Conservation Measures: The Asian Elephant is listed as Endangered (EN) on the IUCN Red List due to rapid population decline and habitat fragmentation. In India, it is protected under Schedule I of the Wildlife (Protection) Act, 1972 and as amended in 2022, affording it the highest level of legal protection. Conservation measures include the establishment of protected areas, identification and securing of elephant corridors, mitigation of human–elephant conflict through early warning systems and community engagement, habitat restoration, and long-term population monitoring. National initiatives such as Project Elephant aim to ensure the conservation of elephants and their habitats while promoting coexistence with local communities.

12. Monocled cobra

Scientific Name: *Naja kaouthia*

Distribution and Habitat: The Monocled Cobra (*Naja kaouthia*) is a venomous snake species native to South and Southeast Asia, and occurs from northeastern and eastern India (including states such as West Bengal, Odisha, Assam and adjacent regions) eastward through Bangladesh, Myanmar, southern China, Thailand, Laos, Cambodia, Vietnam and northern Peninsular Malaysia. It has been reported up to about 1,000 m above sea level, though most populations occur at lower elevations. This species occupies a variety of habitats and is tolerant of altered environments. It occurs in forests, grasslands, agricultural landscapes (such as paddy fields), wetlands, scrublands, and even in human-modified areas including villages and peri-urban zones. It is often associated with areas that have abundant prey (e.g., rodents) and shelter such as burrows, vegetation, and water bodies.

Ecology and Behaviour: Monocled Cobras are primarily terrestrial and crepuscular to nocturnal in activity, though they may bask during the day. They are generally elusive but will display typical cobra defensive behavior — raising the front portion of the body, spreading the hood, and producing a loud hiss when threatened. They are opportunistic predators, feeding on small vertebrates such as rodents, frogs, toads, fish, lizards, and occasionally other snakes. In agricultural settings, they often utilize rodent burrows in field embankments. Some populations, particularly in parts of India, have been documented to have the ability to spit venom, though this trait is not consistently present in all individuals across the range. Monocled Cobras may avoid conflict by fleeing when disturbed but will defend themselves if cornered. Despite their reputation, they generally avoid human contact where possible.

Breeding: Monocled Cobras are oviparous (egg-laying). Females lay clutches of approximately 16–33 eggs, with incubation periods typically ranging 55–73 days. Clutching often occurs in sheltered ground sites or debris heaps. Female parental care, in the form of egg attendance, has been reported in some cases. Seasonal timing of reproduction may vary geographically, but egg laying is usually concentrated in the warmer months of the year.

Threats: Although widely distributed and adaptable, *Naja kaouthia* faces several threats in parts of its range. Habitat loss and fragmentation due to agricultural expansion, urban development and infrastructure projects reduce available habitat and increase encounters with humans. Human–snake conflict, particularly persecution of snakes due to fear and snakebite risk, leads to direct killing. Road mortality, incidental capture, and disturbance of nesting sites also contribute to mortality. In some areas the species is targeted for the skin trade and local use in traditional medicine, although harvesting pressure is generally considered lower than for some other snake species.

Naja kaouthia is assessed as Least Concern (LC) on the IUCN Red List due to its wide distribution, presumed large population and tolerance of a broad range of habitats including human-modified environments.

Conservation Measures: The species is listed in Appendix II of CITES, regulating international trade to avoid over-exploitation.

In India, *Naja kaouthia* is included under Schedule I of the Wild Life (Protection) Act, 1972, as amended up to 2022, providing the highest level of legal protection — hunting, capture, trade, possession, and commerce of this species and its derivatives are prohibited except under specific permits for scientific research or management. Conservation actions include public awareness on snakebite safety and snake conservation, protection of natural habitats and corridors, mitigation of human–snake conflict, and research on population trends and venom variation to inform management.

13. Checkered Keelback

Scientific Name: *Fowlea piscator*

Distribution and Habitat: The Checkered Keelback is widely distributed across South and Southeast Asia, including India, Nepal, Bangladesh, Sri Lanka, Myanmar, Thailand, and southern China. In India, it is one of the most common non-venomous snakes found near water bodies. Its preferred habitats include rivers, lakes, ponds, marshes, irrigation canals, rice fields, and reservoirs. It is highly aquatic but also ventures onto land, especially in agricultural areas and human settlements near water sources.

Ecology and Behaviour: *Fowlea piscator* is a medium-sized, non-venomous snake characterized by its checkered pattern of black or dark brown blotches on a lighter background. It is active both during the day and night but is mostly diurnal. An excellent swimmer, it hunts actively in water, preying primarily on fish and amphibians such as frogs and toads. It also consumes tadpoles and occasionally

small reptiles. When threatened, it may flatten its body and strike aggressively, often mistaken for a venomous species, leading to unnecessary killings by humans. Despite this defensive display, it is harmless to humans.

Breeding: Breeding usually occurs during the monsoon season (June–September). Females lay 6–30 eggs in concealed places such as under stones, inside crevices, or in moist soil near water bodies. Incubation lasts about 6–8 weeks, depending on temperature and humidity. Hatchlings are independent from birth and begin feeding on small amphibians and fish.

Threats: The Checkered Keelback faces threats primarily from human persecution due to mistaken identity as a venomous snake. Habitat destruction, pollution of wetlands, and loss of aquatic ecosystems due to urbanization, agriculture, and industrialization impact its survival. Road mortality is also common in areas where it crosses roads near wetlands. Use of pesticides in agricultural fields reduces its prey base and may poison snakes indirectly.

Conservation Measures: The species is non-venomous and plays an important role in controlling fish and amphibian populations in freshwater ecosystems. It is not currently considered threatened and is classified as Least Concern (LC) on the IUCN Red List due to its wide distribution and adaptability. In India, it is listed in the Schedules of the Wildlife Protection Act, 1972 as amended in 2022. Conservation measures include wetland protection, awareness campaigns to reduce unnecessary killings, and research on its ecological role in aquatic habitats.

14. Yellow or Golden Monitor Lizard

Scientific Name: *Varanus flavescens*

Distribution and Habitat: The Yellow or Golden Monitor is distributed across the northern Indian subcontinent, including India, Nepal, Bangladesh, and parts of Pakistan. In India, it is found mainly in the Gangetic plains, Terai grasslands, and floodplains of northern and eastern regions. Its preferred habitats include wetlands, marshes, riverbanks, agricultural fields, and grasslands. Unlike some other monitor lizards, *V. flavescens* is strongly associated with moist habitats and is often seen near water bodies.

Ecology and Behaviour: The Yellow or Golden Monitor is a medium-sized lizard, generally smaller than the Bengal Monitor (*Varanus bengalensis*). It is primarily diurnal and spends much of its time foraging on the ground, though it can climb trees and swim well. Its diet is carnivorous and opportunistic, consisting of insects, frogs, crabs, small mammals, bird eggs, fish, and carrion. By scavenging, it plays an important role in nutrient cycling. It is generally shy and avoids human contact, retreating into burrows, vegetation, or water when threatened. However, when cornered, it can defend itself using strong claws and tail lashes.

Breeding: Breeding typically occurs during the summer months (May–July). The female lays 10–20 eggs in burrows, termite mounds, or moist soil near water bodies. Incubation lasts for several months, depending on environmental conditions. Hatchlings emerge during the late monsoon or early winter and are independent from birth, feeding mainly on insects and small prey.

Threats: The Yellow or Golden Monitor faces multiple threats across its range. Habitat loss due to wetland drainage, agricultural expansion, and urbanization has reduced its populations. It is frequently killed by humans out of fear or for local consumption. Illegal hunting and poaching for meat, skin, and use in traditional medicine and superstitions also pose significant threats. Road mortality is another concern, as the species often forages near human-dominated landscapes.

Conservation Measures: Globally, it is listed as Endangered (EN) on the IUCN Red List due to its restricted distribution and population decline. Conservation strategies include strict enforcement of anti-poaching laws, protection of wetlands and riverine habitats, awareness campaigns to reduce human persecution, and community participation in conserving local biodiversity. Research on its ecology and monitoring of populations are essential for long-term conservation

15. Russell's Viper

Scientific Name: *Daboia russelii*

Distribution and Habitat: Russell's Viper is one of the most widespread venomous snakes in Asia. Its distribution covers the Indian subcontinent, Sri Lanka, Bangladesh, Nepal, Myanmar, Thailand, and parts of Southeast Asia. In India, it occurs throughout most of the country except in the high Himalayas and arid deserts. It prefers open habitats such as scrublands, grasslands, farmlands, and plantations, and is often found near human settlements due to abundant rodent prey. It avoids dense forests and extremely cold or high-altitude regions.

Ecology and Behaviour: This is a large, heavy-bodied viper with a distinctive chain of oval spots along its back. It is primarily terrestrial and nocturnal but may also be active in the day during cooler weather. Russell's Viper is highly irritable and aggressive when provoked. Its diet mainly consists of rodents, making it ecologically important for controlling pest populations, though it may also feed on lizards, frogs, and small birds. It relies on camouflage for defense but, if disturbed, produces a loud hissing sound before striking. It is one of the “Big Four” snakes of India responsible for most snakebite incidents and fatalities due to its wide distribution, abundance near human habitation, and potent hemotoxic venom.

Breeding: Unlike many snakes, *Daboia russelii* is viviparous (gives birth to live young). Mating usually occurs in the early part of the year, and females give birth during the monsoon or late summer (around May–October). Litter size can be large, ranging from 20 to 40 young, though up to 60 have been recorded. Newborns are independent from birth and already venomous.

Threats: While Russell's Viper is widespread and not immediately threatened, it faces localized pressures. Habitat destruction, road kills, and large-scale killing by humans due to fear contribute to population declines in some areas. Collection for venom extraction (used in producing antivenom) also puts pressure on wild populations. Agricultural practices expose both farmers and snakes to frequent encounters, increasing conflict.

Conservation Measures: Globally, it is not considered threatened and is listed as Least Concern (LC) on the IUCN Red List due to its wide distribution and adaptability. Conservation measures focus on reducing human-snake conflict, ensuring sustainable venom extraction practices, and raising awareness about snakebite management. Habitat conservation in agricultural landscapes and public education about the ecological role of snakes can reduce unnecessary killings.

16. Shikra

Scientific Name: *Accipiter badius*

Distribution and Habitat: The Shikra, a small bird of prey, is widely distributed across Asia and Africa. In India, it is one of the most common raptors, found throughout the country in forests, scrublands, agricultural fields, urban parks, and even gardens. It adapts well to human-modified landscapes and is often seen perched on trees or wires in rural and urban areas. It prefers open woodland, thorn scrub, and cultivated landscapes, but avoids very dense forests and high-altitude habitats.

Ecology and Behaviour: The Shikra is a swift, agile hunter known for its sharp vision and fast flight. It primarily feeds on small birds, rodents, reptiles (lizards, snakes), amphibians, and large insects. Using surprise attacks, it swoops down on prey from a perch or while in flight. Shikras are generally solitary but may be seen in pairs during the breeding season. They are active during the day, particularly in the morning and late afternoon. Their call is a sharp, repetitive "kek-kek-kek," often heard during courtship or when alarmed. As a top small predator, the Shikra plays a role in regulating populations of small vertebrates and insects.

Breeding: Breeding in India generally occurs from March to June. The Shikra builds a small stick nest, usually high in trees, sometimes in urban parks or roadside trees. Both sexes participate in nest building. The female lays 3–5 pale bluish-white eggs. Incubation, mostly done by the female, lasts for about 18–20 days, while the male provides food. Chicks fledge after about 25–30 days but may remain dependent on the parents for several weeks.

Threats: The Shikra is relatively secure but faces threats from habitat loss due to deforestation and urbanization. Use of pesticides in agriculture reduces prey populations and may poison raptors indirectly. Persecution and trapping sometimes occur, as Shikras have historically been trained for falconry in parts of India. Collisions with vehicles and electrocution on wires also cause local mortality.

Conservation Measures: Globally, it is listed as Least Concern (LC) on the IUCN Red List due to its wide range and stable populations. Conservation actions focus on maintaining green spaces, reducing pesticide use, and protecting nesting sites. Public awareness about the ecological importance of raptors as natural pest controllers further supports its conservation.

1.61 IMPACT ON DISPLACEMENT/MOVEMENT OF FAUNA- TERRESTRIAL, AQUATIC, OR AERIAL (SUCH AS THE CREATION OF BARRIERS, ETC.)

It should be noted that even the areas where plantation is being done will not be immediately available for wild animals. With no observed movement in the core zone due to the industrial nature of the project area, the focus shifts to the buffer zone where wildlife movement has been documented. Additionally, the company is implementing comprehensive measures for the conservation and protection of wildlife species within the buffer area. To enhance the protection of faunal diversity, measures will be taken to provide maximum possible food, shelter, and cover. Barbed wire fencing has been implemented in most areas of the Plant within the impact zone. Wild animals within this area typically avoid the Project areas due to routine activities, lighting, and the movement of vehicles in and around the project. These measures collectively contribute to minimizing potential disturbances to wildlife within the project's influence.

Impacts during construction phase:

During the construction phase, the impacts will be due to the following activities:

- Movement of vehicles containing construction material and machinery used for construction.

Impacts during operation phase:

During the operation phase, the impacts will be due to the following activities:

- Inward movements of vehicles containing Raw material and Outward movement of vehicles containing Finished products and Hazardous waste after screening.

Based on observations, literature review and consultations with the local people and experts, we formulated following impact vs. mitigation matrix.

- Direct Threat- Direct threat is due to the fear of wild animals causing use of some deterring methods to avoid entrance of wild animals in the core and buffer area. This may lead to killing of the wild animals. There may also be accidental killings due to movement of large number of vehicles, machineries and equipment. Fire near roadside also poses a direct threat as a number of small and medium animals are trapped and killed in the forest fire, and sometimes the large animals are also trapped.

- Indirect Threat- Indirect threat is due to shrinkage and impact on habitat, shortage of Food and water. The animals in search of food and water try to enter in to habitations. Most of the man animal conflict takes place due to indirect threat.

1.7 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

S. No.	Parameters	Impact	Mitigation
1.	Direct Impact	<ul style="list-style-type: none"> Loss of fallow fields and agricultural lands; Fragmentation of habitats. Dust deposition on vegetation; noise and other disturbance to birds and other wild animals. 	<ul style="list-style-type: none"> No loss of habitat, as the plant site does not locate in any designated forest land. There is one Durgapur PF (~4.8 km in North East Direction from plant site) and one Beliatare RF (~9.0 km in South West direction from plant site) in the study area, therefore awareness among local people and company employee for wildlife education is essential. Some fugitive dust will be generated from transportation activities, which will be/ is being controlled by water spraying and existing green belt around the plant boundary which acts as an effective green barrier
2.	Indirect Impact	<ul style="list-style-type: none"> Occurs as a result of the activity, i.e. all the potential impacts that do not manifest immediately with the activity or which occur at a different place as a result of the activity, Example: Invasion of alien weed species. Vegetation damage due to industrial pollutants may have secondary effects on associated fauna like insects & birds. 	<ul style="list-style-type: none"> Native plants species as per CPCB guidelines, and as per Bio- geographic zones of India will be selected in greenbelt and plantation programme. No exotic species will be used. Fugitive emission, noise generation will be minimized at maximum level for the control of adverse impact on insects & birds, which is better pollinators in our Ecosystem.
3.	Construction Stage Impact	<ul style="list-style-type: none"> Permanent loss of habitat: Fragmentation: Habitat isolated in patches due to plant location. Habitat damage: Habitats damaged due to loss and disturbance of plant communities and listed plant species and invasion of alien species. Due to Industrial Pollutants: Dust, and gases generated during construction phase may affect human beings, plants, animals and habitats nearby 	<ul style="list-style-type: none"> No habitat will be fragmented from the plant activity. No loss of plant communities and no planting of exotic species, only ecologically important indigenous plants species will be planted. Fugitive dust emissions will be prevented by water sprinkling on roads and construction site
4.		<ul style="list-style-type: none"> The level of impact varies with the habitats and species present and the type of project / activity. Such as invasion of exotic species, disturbance to wildlife and reduction of its movement, reduction of genetic diversity and population viability, alteration of ecological flow paths Induced by physical alterations (changes in the water flow, light, temperature, etc.). 	<ul style="list-style-type: none"> Existing Greenbelt all along boundary to reduce dust and noise pollution. No exotic species will be planted. No movement of wildlife will be done in Plant's core area.

CHAPTER-III

a) OBJECTIVES OF MANAGEMENT TO ADDRESS THE ISSUE OF WILDLIFE CONSERVATION (BOTH FLORA AND FAUNA) ARISING OUT OF PROJECT IMPLEMENTATION.

Objective of the Wildlife Conservation Plan

1. Preservation of Biodiversity: Ensure the protection and conservation of both plant and animal species in the Project area. This includes safeguarding their habitats, promoting sustainable ecosystem management, and preventing the loss of biodiversity.

2. Mitigation of Negative Impacts: Implement measures to minimize adverse effects on wildlife caused by the project. This involves identifying potential risks and developing strategies to mitigate habitat fragmentation, disturbance, pollution, and other detrimental factors.

3. Habitat Restoration and Enhancement: Undertake efforts to restore and enhance habitats affected by the project. This may involve reforestation, habitat rehabilitation, creation of wildlife corridors, and promoting ecological connectivity to support the natural movement of species.

4. Species Management: Implement specific measures to protect and manage endangered, threatened, or vulnerable species within the Project area. This can include species monitoring, population management, and implementing conservation programs tailored to the needs of particular species.

5. Stakeholder Engagement and Awareness: Foster collaboration with local communities, government agencies, NGOs, and other stakeholders to raise awareness about wildlife conservation. Encourage participation in conservation efforts, promote sustainable practices, and establish mechanisms for ongoing dialogue and feedback.

6. Compliance with Environmental Regulations: Ensure strict adherence to relevant environmental laws, regulations, and permits pertaining to wildlife conservation. This includes monitoring and reporting on compliance, as well as taking corrective measures when necessary. By addressing these management objectives, the project aims to mitigate the impacts on wildlife, preserve biodiversity, and promote sustainable coexistence between the project and the natural environment.

b) STRATEGIES TO MITIGATE AND MINIMIZE ADVERSE IMPACTS AS INDICATED IN CHAPTER- 2:

Habitat to be developed as a gradual process side by side with the Plant activities.

A. Soil Conservation Measures

- All earth work will be completed in such a way so that the soil erosion and carryover of the materials in other areas are protected.
- Excavated soil will be stored properly to avoid the spread of wind-blown dust and shall be reused for backfilling, landscape development and greenbelt maintenance.

- Proper disposal of construction debris will be maintained so that top soil is not contaminated at the construction place.
- The greenbelt and plantation will increase the aesthetic beauty and prevent soil erosion

B. Air Pollution Management Measures

- To control the emissions, the existing air pollution control (APC) devices installed in the plant include 4 bag filters in Extrusion-1; 5 bag filters and 1 scrubber system in Extrusion-2; 4 ESPs, 7 bag filters and 1 cyclone separator in the Baking Ried Hammer Furnace; 2 incinerators in the Re-Baking Tunnel Kilns (1 & 2); 2 water spray and cooling chambers, 3 bag filters and 1 cyclone separator in the Pitch Impregnation Units (2, 3 & 4); 1 bag filter in the Acheson Unit; and 9 bag filters with 1 cyclone separator in the Finishing Units (1-4). After expansion, Extrusion-1 will additionally be equipped with 5 bag filters and 1 scrubber system.
- The DG sets are provided with stacks of adequate height so as to disperse the emanating flue gases containing suspended particulate matter, oxides of Sulphur and Nitrogen without affecting the ground level concentrations.
- Use of Fume suppression Scrubber system and use of clean fuel CBM (Coal bed Methane gas).
- Regular cleaning of internal roads with Road cleaning Dust suction vehicle.
- Raw material handling in encased / closed Elevators.
- Vacuum Suction Process Handling system is used.
- Regular water sprinkling is done to control dust emissions.
- 34.87% of the plant area has already been developed as greenbelt in the plant premises as well as in the old and new colony. As part of CEPI Action Plan, the greenbelt will be increased to 40 % as avenue plantation due to space constraint inside the plant premises. The company has obtained relevant permissions from authorities for development of greenbelt outside plant.
- Online Stack Monitoring system is already installed at the plant site with existing stacks and will be proposed also.
- The overall quality of the ambient air is being/will be monitored and maintained within the limits prescribed by CPCB / SPCB after the commencement of the operations of expansion project.

C. Water Management Measures

- The project is being/will be completely based on Zero Effluent Discharge. Wastewater generated is being/ will be 100% utilized in the plant premises.
- Domestic wastewater will be treated separately in STPs in plant and utilized in greenbelt & misc. activities inside plant premises.

- Proper management of rain water run-off during monsoon and creating bunds to utilize the rain water for construction purpose. An appropriate water management system will be implemented

D. Noise Management Measures

- All the design/installation precautions as specified by the manufacturers with respect to noise control will be strictly adhered to for the expansion project too.
- High noise generating sources are insulated adequately by providing suitable enclosures.
- Design and layout of building to minimize transmission of noise, segregation of particular items of plant to avoid reverberant areas.
- Equipment producing high noise are designed and procured with acoustic enclosures.
- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units.
- Noise control system designed to form an integral part of the plant.
- The existing greenbelt with rich canopy helps to attenuate the noise emitted by the various sources in the plant.

E. Solid and Hazardous Waste Management Measures

- The solid waste materials generated post-expansion to 80 KTPA include Graphite Fines at 14,734 TPA, Graphite End cut Scrap at 1,146 TPA, Graphite Burnt Spacer Scrap at 1,158 TPA, Graphite Electrode / Nipple scrap at 215 TPA, CPC Residue fines (From LWG & Coke fines from Macawber Pack media system) at 728 TPA, CPC Residue fines (RH + Baked Turning chips) at 3,439 TPA, Pitch coke at 2,030 TPA, Metcoke Residue Fines -35 (Demco fines) at 18090 TPA, Metcoke Residue Fines (Rejected) at 4,299 TPA, and ESP pitch (Coal Tar-Pitch from Waste Rec. System) at 574.19 TPA. It will be Sold to Steel Industries & Carbon traders and ESP Pitch will be sold to Hazardous waste authorized recyclers.
- The total quantities of Hazardous waste materials are as follows: Used oil/Waste Oil- 21.50 MT/annum, Waste sludge at 22.13 MT/annum, ESP coal tar residue at 574.19 MTPA, Empty/ discarded drums/ containers/ barrel at 2.39 MTPA, Discarded asbestos at 8.22 MTPA, Oily cotton waste at 24.88 MTPA, Metwrap at 5.68 MTPA, Thermocole at 0.21 MTPA, and ETP sludge at 10.97 MTPA.
- Hazardous waste will be disposed through authorized vendor as per WBPCB/ CPCB guidelines.
- Municipal solid waste generated from the plant is being and will be segregated and disposed-off scientifically.

F. Other Measures

- Out of the total existing area, about 34.87 % has been already been developed under greenbelt development, at present, total 15966 plants area & in the Old +New Colony area. As part of the expansion, 40 % greenbelt will be developed as avenue plantation.

- Native plant species will be planted in consultation with local authorities.
- Greenbelt will be developed as per Central Pollution Control Board (CPCB) guidelines.
- Greenbelt development along with the road & plant boundary will attenuate noise level, arrest dust and improve the environment in surrounding.
- Greenbelt & plantation development will begin simultaneously with the initiation of construction activities of the proposed unit.

CHAPTER IV

A) INTERVENTIONS MUST BE CARRIED OUT BY THE PROJECT'S AUTHORITY INSIDE THE PROJECT AREA (CORE AREA) AND BE PROPERLY JUSTIFIED SUGGESTED MEASURES

INTERVENTIONS INSIDE PLANT AREA (TO BE IMPLEMENTED BY THE PROJECT AUTHORITIES):

The following steps will be taken within the plant area:

I. AIR POLLUTION CONTROL MEASURES

Anticipated Impacts

Increase in dust (Particulate Matter) and NO_x concentration due to Levelling activity and Heavy vehicular movement.

- The main sources of dust emission are the movement of equipment at site, levelling, grading, earthwork and foundation works.
- Fugitive dust emissions from vehicles and equipment to be deployed during the construction phase is also likely to result in marginal increase in the levels of SO₂, NO_x, PM, CO and un-burnt hydrocarbons.
- Loading and unloading activities may impact air quality.

The impact due to construction activities is mainly the health effects such as respiratory diseases. However, the impacts will be for short duration and of minor nature. This will be confined within the plant boundary and is expected to be negligible outside the plant boundary. The impact will, however, be reversible, marginal and temporary in nature.

Mitigation measures

- Extensive dust extraction network is provided.
- Water spraying on roads and construction site will prevent fugitive dust.
- Proper maintenance of vehicle and construction equipment will help in controlling the emissions.
- Construction equipment having PUC Certificate will be deployed during the activity to restrict exhaust emission.
- Vehicles having construction materials will be covered with tarpaulin.
- Proper training of the drivers so as to ensure adherence to speed limit.
- A separate storage area will be demarcated for construction material to confine the dust dispersion.
- Covered storage facilities will be provided.
- Proper PPEs will be provided to workers to avoid accumulation of dust in respiratory tracts and prevent air borne diseases.
- Proper greenbelt development and plantation inside and outside the plant premises.

II. NOISE POLLUTION CONTROL MEASURES

Anticipated impacts

During construction phase, noise will be generated due to following activities/ processes:

- Increase in noise level due to construction equipment may cause irritation, disturbance in sleep, hearing problems etc.
- During construction phase, noise will be generated due to following activities / processes:
- Movement /operation of transport and construction vehicles / equipment.
- Transportation of equipment, materials and people.
- Other important activities involved in construction stage such as drill, hammering, Cement mixing, heavy vehicle transportation, welding, excavation, Cut & fill during construction of expansion project. Earth work will be done for the construction purpose for installation of ETP, D.G Sets and other facilities.

The noise generated may be high due to construction activities, high noise levels can cause irritation and gradual hearing loss to construction labourer's if high levels of noise exposure are continuously experienced. Sudden exposure can cause irritation in ear drums and sudden loss in hearing whereas long term exposure will result in gradual ENT problems. Though the noise generation during construction phase will be temporary and will be limited to the plant site but workers who are directly exposed to it can have problems related to it.

Mitigation Measures:

- The vehicles used for movement will be taken for preventive maintenance to reduce noise generation.
- The construction labours will be provided with adequate personal protective equipment like earmuffs and earplugs.
- Continuous exposure of workers will be avoided by alternating the duties on daily basis.
- The high noise zones at site will be demarcated and provided with enclosures & barriers.

III.WATER POLLUTION CONTROL MEASURES

Anticipated Impacts

- Water requirement at construction phase will be mainly for construction of civil works, dust suppression and drinking purpose. Water demand during the construction phase will be met from the recycled water. Impact on water quality during construction phase will be mainly due to sewage generated from the work station of construction workers. For the construction workers, Sewage generated from construction phase will be treated in STP. As the construction work mainly include mechanical fabrication there will be less requirement of water for construction work. The overall impact on water environment during construction phase due to proposed expansion project is likely to be temporary, short term and insignificant.

- The treated water will be reused for gardening purpose within the plant premises. There will not be any discharge from the site during the construction stage which can have any impact on the water quality of the surrounding area. The following anticipated impacts on water quality could occur during construction phase:
- Increase in suspended solids due to soil run-off during heavy precipitation due to loose soil at construction site.
- Oil and suspended solids in run-off from vehicles and access roads.
- Domestic waste water will be generated during construction activities and stagnant water or water logging for a long time may leads to various water borne diseases & unpleasant smell in nearby area.

Mitigation Measures

- Domestic waste water will be treated separately in Sewage Treatment Plant.
- Construction workers will be brought from nearby villages so that domestic water is saved in many ways due to temporary requirements only.
- The drains will be properly aligned in conformity with the site drainage pattern so that the alteration is kept to the minimum and flooding or soil erosion does not occur.
- No discharge of waste water generated during construction activity will be done on soil or land area.

Thus, there will not be any discharge from the site which can have any impact on the water quality of the surrounding areas.

IV. SOLID AND HAZARDOUS WASTE MANAGEMENT MEASURES

Anticipated Impacts

During construction activity, there are several kinds of wastes generated within the premises. Inappropriate disposal of wastes could lead to damage to water & soil environment, ecology & biodiversity and discomfort to workers and nearby people around the project site. Mismanagement of wastes can cause degradation of soil quality, water pollution, damage to local biodiversity, it would also cause uneasiness & illness to local workers and nearby people as it could lead to vector-borne diseases. Such practices should not be encouraged and the premises must be kept devoid of waste.

Mitigation Measures

- The waste generated due to site clearing prior to the construction phase will be mainly utilized in the levelling.
- Left over construction material if any having a high recycling value and reuse value thus will be sold to the respective recyclers.
- Dry & wet solid waste generated by the construction workers will be managed by placing proper segregated litter bins and will be transferred to the identified nearby secondary

stations. Recyclable contents will be sold to recyclers and organic waste will be disposed to the local authority.

V. BIOLOGICAL ENVIRONMENTAL CONTROL MEASURES

- Out of the total existing area, about 34.87 % has been already been developed under greenbelt development, at present, total 15966 plants in work Area & in the Old +New Colony area. As part of the expansion, 40 % greenbelt will be developed as avenue plantation.
- Native plant species will be planted in consultation with local authority.
- Greenbelt will be developed as per Central Pollution Control Board (CPCB) guidelines.
- Greenbelt development along with the road & plant boundary will attenuate noise level, arrest dust and improve the environment in surrounding.

Greenbelt & plantation development will begin simultaneously with the initiation of construction activities of the proposed unit.

VI. ODOUR MANAGEMENT

- Adequate greenbelt all around the periphery of the plant will be maintained.
- Longer storages of any product/by-products will be avoided & use of efficient biocides to control bacterial contamination.

VII. GREENBELT DEVELOPMENT AND PLANTATION PROGRAMME

As per CPCB guidelines for developing greenbelt dated March 2000, *“Green belts are thought to be effective in such scenarios where green plants form a surface capable of sorbing air pollutants and forming sinks for pollutants Leaves with their vast area in a tree crown, sorbs pollutants on their surface, thus effectively reduce their concentrations in the ambient air. Often, the sorbed pollutants are Incorporated in metabolic stream and thus the air is purified. Plants grown in such a way as to function as pollutant sinks are collectively referred to as green belts”*.

Objective

Greenbelt is a set of rows of trees planted such a way that they form an effective barrier between the plant and the surroundings. The main purpose of green belt development is to contribute to the following factors:

- To attenuate noise levels generated from the plant;
- To improve the aesthetics of the Project area;
- To trap the vehicular emissions and fugitive dust emissions;
- To maintain and improve biodiversity;
- To prevent soil erosion and to protect the natural vegetation;
- Provision of wide greenbelt around the plant has been foreseen to reduce any adverse impacts on the surrounding population due to emissions from the proposed plant. Plantation of grass, flowers, bushes and trees will be taken-up to reduce generation of dust from bare earth and to enhance the aesthetic/ scenic value

Benefits of Greenbelt Plantation

- Stabilizing erodible slopes to minimize pollution
- Control of dust
- Enhancement of aesthetic value
- Minimizing evapo-transpiration loss which helps to recharge ground water in the area
- Reducing noise

Greenbelt & Plantation Programme

Out of the total existing area, about 34.87 % has been already been developed under greenbelt development, at present, total 15966 plants in work Area as well as in the Old +New Colony area. As part of the expansion, 40 % greenbelt will be developed as avenue plantation.

Existing Greenbelt

Description	Existing
Total Plant Area	22.44 ha
Total Area of Greenbelt including Plant premises as well as Old and new Colony	7.82 ha
No. of Plants	15966 trees
Percentage	~34.87 % of the total plant area



Greenbelt Photographs

As part of CEPI Action Plan, the greenbelt will be increased to 40 % as avenue plantation due to space constraint inside the plant premises. To fulfil 40 % greenbelt criteria, additional plantation of 5.13 % i.e., 1.156 hectare is to be done by the company.

For this, permission has been granted by Asansol Durgapur Development Authority vide memo no. ADDA/DGP/PC-56/25-26(60) dated 24/06/2025 for development avenue plantation along roadside of two patch of land which is depicted below.

<p>In this road – Plantation coverage on Both side of road will be average 1.5meter width & centre of the road will be 0.75 meter width amounting to 2.2 ha land.</p>	<p>In this road – Plantation coverage on Both side of road will be average 1.8 meter width amounting to 0.4 ha land.</p>

CHAPTER-V

PROPOSED MANAGEMENT STRATEGIES WITHIN THE BUFFER AREA OF 10 KM IDENTIFIED AROUND THE PLANT AREA AND INCLUDE FOLLOWING POINTS:

a) Interventions to be implemented by the project authorities inside the project area (buffer area) with suitable justifications

Implementing a wildlife conservation plan for the plant site at Durgapur & District: Paschim Bardhaman (West Bengal) requires careful consideration of the surrounding ecosystem and potential impacts on wildlife. Measures that the Divisional Forest Officer (DFO) could consider for the implementation of a buffer zone wildlife conservation plan.

Methodology

To achieve the above goals of vision following methodology can be adopted by Forest Department:

- As a responsible company undertaking the proposed expansion project in Paschim Bardhaman (West Bengal), company priority lies in ensuring the safety and conservation of wildlife in the surrounding areas. Company commitment to environmental stewardship drives our efforts to implement comprehensive measures aimed at safeguarding wildlife throughout the project lifecycle.
- To initiate this process, thorough habitat assessments and mapping exercises was conducted to identify critical wildlife habitats, migration routes, and ecological corridors in the project vicinity. This understanding will inform the establishment of buffer zones around the project site, designed to mitigate potential disturbances to wildlife habitats and ensure ecological connectivity. Collaboration with environmental experts and regulatory authorities will guide the determination of the size and boundaries of these buffer zones, incorporating habitat requirements of key wildlife species and the extent of potential project impacts.
- In addition to establishing buffer zones, a range of wildlife monitoring and management programs will be implemented with the help of DFO.
- Commitment to wildlife safety extends to the design and construction phases of the project. Wildlife-friendly fencing along roads and infrastructure will be installed to prevent collisions between vehicles and animals.

Throughout the project lifecycle, stakeholder engagement and community involvement in wildlife conservation efforts will be prioritized. Collaboration with local, stakeholders, and indigenous groups will raise awareness about the importance of wildlife conservation and the role of buffer zones in safeguarding biodiversity. Education and outreach initiatives will empower stakeholders to become stewards of wildlife safety in their communities.

- Commitment to wildlife safety will be upheld through rigorous enforcement of legal protections and adherence to environmental regulations. Protected areas, wildlife reserves, and conservation easements will be established to safeguard critical habitats and biodiversity hotspots. Collaboration with government agencies, non-governmental organizations, and conservation partners will leverage resources, expertise, and funding for wildlife conservation initiatives.
- By integrating these measures into our wildlife conservation plan, we demonstrate our commitment to responsible environmental management and sustainable development. Recognition of the importance of wildlife safety in promoting the long-term health and resilience of ecosystems in the project area underpins our dedication to upholding the highest standards of conservation excellence throughout the project lifecycle.
- Specialized training programs will be conducted for machinery operators and drivers, emphasizing the importance of maintaining appropriate speeds and exercising utmost caution when encountering wildlife, particularly in proximity to forest areas.
- Strict adherence to the use of vehicles with valid and up-to-date Pollution Under Control (PUC) certificates will be ensured for all project-related activities.
- Close collaboration and coordination with the Forest Department will be established to facilitate the construction of essential infrastructure, allocation of veterinary funds, provision of ambulances equipped with cages, and the establishment of dedicated rescue wards. These measures aim to actively contribute to the conservation and protection of wildlife.

HABITAT IMPROVEMENT THROUGH MIYAWAKI PLANTATION

The preservation and enhancement of habitat play a vital role in providing essential food and shelter for wild animals. Efforts will be made to develop and maintain a favourable habitat that not only supports the targeted wildlife species but also promotes conditions conducive to the presence of other prey animals. This comprehensive approach aims to create a thriving ecosystem that benefits the entire wildlife community.

- **Miyawaki Plantation of Native Species-**

Native species of Durgapur region (*Sal Shora robusta*, *Piyal Buchanania lanzan*, *Nem Azadirachta indica*, *Banyan Ficus benghalensis*, *Mango Mangifera indica*, *Kadam Neolamarckia cadamba*, and fruit-bearing trees like *Guava* and *Jamun*) will be planted. The plantation will be carried out on degraded patches, village fringes, and roadside areas to provide food, shade, and shelter for birds, pollinators, and small mammals. The dense multi-layered plantation will also act as a noise and dust buffer for the village.

AWARENESS AND EXTENSION

- **Signages and Direction Boards** will be installed along Damodar riverbanks, village entry points, and near plantations with messages like “Protect our River – Protect our Wildlife”, “Drive Slow, Animals Cross Here”

- **Wildlife Week (2nd –8th Oct)** will be celebrated and these activities can be done: Quiz competitions for school children **or** Cultural events involving folk songs and street plays on coexistence with wildlife **or** Seminars on the importance of Wildlife.
- **Forest staff and Joint Forest Management Committee (JFMC) members** will be included to strengthen participatory management.

SUPPORT TO FOREST DEPARTMENT FOR MONITORING AND HUMAN-ANIMAL CONFLICT MITIGATION:

- **Tranquilization Gun with Accessories:** To rescue and relocate large mammals (nilgai, wild boar, jackals) occasionally straying into fields.
- **Rescue Item Kits:** Nets, cages, snake hooks, stretchers for safe handling of wildlife.
- **Veterinary Services:** Supply of essential drugs, consumables, and periodic vaccination drives for cattle to prevent disease spillover to wildlife.
- **Search Lights:** For night-time rescue and patrolling by forest staff and JFMC members.

AWARENESS & ANTI-POACHING SENSITIZATION MEASURES ALONG WITH MAN-ANIMAL CONFLICT MANAGEMENT

- Training programs will be conducted for security staff and site supervisors to enhance their capacity for timely identification, documentation, and reporting of wildlife sightings, including adherence to standard reporting protocols and coordination with the Forest Department. Regular refresher sessions will be organized to ensure preparedness and compliance.
- Information, Education, and Communication (IEC) materials such as posters and pamphlets focusing on anti-poaching awareness and man–animal conflict prevention will be developed and displayed at strategic locations. These materials will help sensitize workers and nearby communities on legal provisions, precautionary measures, and appropriate response mechanisms.

MONITORING AND SUCCESS INDICATORS

- **Habitat Improvement:** Survival rate of plantations.
- **Water Quality & Riparian Health:** Reduction in visible plastic waste and increased bird nesting on sandbars.
- **Conflict Reduction:** Fewer incidents of reptile mortality on roads and timely rescue operations.
- **Awareness:** Regarding Poaching and importance of Schedule 1 species.

SUPPORTING ACTIVITIES REQUIRED FROM THE STATE GOVERNMENT.

After recommendation of Deputy Conservator of Forest of Paschim Bardhaman division proposal forward to Conservator of Forest, Chief Conservator of Forest and Principal Chief Conservator of Forest West Bengal/ Chief Wildlife Warden of West Bengal State.

REVIEW AND MONITORING OF WILDLIFE CONSERVATION PLAN

The conservation plan proposed for the Schedule- I fauna in buffer area of plant site should be monitored continuously to assess any short comings and to remediate further and implement the plan to achieve the goal for conservation and improvement of the wildlife population and its habitat. The team will review the progress and evaluate the works and submit reports periodically. There port should also suggest remedial measures for effective conservation and management of the threatened and Schedule - I faunal species. Every six months, a report along with the financial outlay and progress of work will be submitted to the concerned DCF/DFO.

JURISDICTION AND OVERSIGHT OF WILDLIFE CONSERVATION PLAN:

Following the recommendation of the Deputy Conservator of Forest from Paschim Bardhaman (WB) Divisions, the proposal will be forwarded to the higher authorities within the Forest Department hierarchy. This plan falls under the jurisdiction of the Forest Department, with the District Forest Officer (DFO), Paschim Bardhaman (WB), as well as the Chief Wildlife Warden of West Bengal State, overseeing its implementation and management.

CHAPTER VI

FINANCIAL IMPLICATIONS AND MONITORING

THE FINANCIAL FORECAST STATEMENT SHOULD DETAIL THE FINANCIAL OUTLAY FOR THE INTERVENTIONS TO BE IMPLEMENTED BY THE PROJECT AUTHORITIES WITHIN THE WCP AREA (CORE & BURIER SEPARATELY). THE ANNUAL WORK PROGRAMME AND ANNUAL OUTLAY FOR EACH COMPONENT SHOULD BE CLEARLY GIVEN IN A TABLE. IT SHOULD ALSO INCLUDE MONITORING AND EVALUATION ARRANGEMENTS FOR THE ACTIVITIES UNDERTAKEN

The company has allocated amount mentioned below for the Wildlife Conservation Plan encompassing various activities mentioned above. These activities, aimed at enhancing habitat improvement, raising awareness, conducting research, and fostering collaboration with the forest department, will be meticulously executed over the course of ten years. The company is committed to ensuring the success of these initiatives by closely working with the forest department, leveraging their expertise and resources to maximize the positive impact on biodiversity conservation. Through this collaborative effort, the company aims to contribute significantly to the protection and preservation of wildlife and their habitats, fostering a sustainable environment for future generations.

Table 7-The Financial Outlay for the Interventions to Be Implemented within the WCP Area (Buffer Zone) along with the timeline (10 years)

							Short Term Plan				Long Term Plan						
SL No.	Activity	Particulars	Name/Type of the area	Qt. in Area/Piece	Rate (Rs.)	Total Cost	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
1	Habitat improvement through Miyawaki Plantation	Soil Testing, improvement and land preparation	Land provided by ADDA or on degraded forest patches near Damodar River Belt or unused panchayat land in 1000 m2	1000 m ²	200	2,00,000	2,00,000	...	....	...	...	...	...	...	...	...
		Pit and Bed Preparation alongwith Plantation including labour cost		2500 samplings	400	10,00,000	10,00,000	...	...	...	...	...	...	...	...	...	...
		Protection through fencing		150 approx. perimeter of wire for 1000 m ²	300	45,000	45,000	...	...	...	...	...	...	...	...	...	...
		Irrigation and Mulching		1000 m ²	100	1,00,000	20,000	10,000	10,000	10,000	10,000	10,000	8,000	8,000	8,000	8,000	8,000
		Maintenance and Gap filling		1000 m ²	200	2,00,000	.....	40,000	....	40,000	.....	40,000	....	40,000	...	40,000	...
		Sub-total 1						15,45,000	12,65,000	50,000	10,000	50,000	10,000	48,000	8,000	48,000	8,000	48,000
2	Awareness and Extension (Forest staff will also be invited for	Installation of Signages/ Boards displaying conservation messages and directional sign	Within 10 km Study Area	10 Nos.	6000	60,000	40,000	20,000	....	....	....	....	....	....	....	....

	various activities to ensure participation)	boards.															
		Wildlife week celebrations	Any school within 10 km Study Area	10 Nos.	33,000	3,30,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	33,000	
		Sub-total 2				3,90,000	43,000	43,000	41,000	41,000	37,000	37,000	37,000	37,000	37,000	37,000	
3	Support to Forest Department for monitoring and to mitigate Human-Animal Conflict (Veterinary care, animal health, rescue, tools, and equipment's etc.)	Purchase of Tranquilization Gun with accessories	10 km study area	1 No.	100000	1,00,000	1,00,000	...	...	...	...	...	...	...	...	...
		Purchase of Rescue item kits	10 km study area	2 No.	30,000	60,000	30,000	30,000
		Veterinary Services includes medicines	10 km study area	10 No of Kits	10,000	1,00,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
		Search Light for staff and JFMC members for conflict	10 km study area	10 Nos.	3000	30,000	8,000	8,000	8,000	6,000
		Sub-total 3				2,90,000	1,48,000	48,000	18,000	16,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
4	Awareness & Anti-Poaching Sensitization Measures along with man-animal conflict	Training of security staff & supervisors on wildlife sighting and reporting protocol	10 km study area	....	....	1,26,000	25200	25200	25200	25200	25200	....	....	....	....	....
		IEC materials (posters, pamphlets on anti-poaching & man-animal conflict prevention)	10 km study area	....	....	1,49,000	29,800	....	29,800	....	29,800	....	29,800	....	29,800	....
		Sub-total 4				2,75,000	29,800	36,000	29,800	36,000	29,800	36,000	29,800	18,000	29,800	--	
Grand Total (1+2+3+4)					25,00,000	14,85,800	1,77,000	98,800	1,43,000	86,800	1,31,000	84,800	1,13,000	84,800	95,000		

190005455

TAX INVOICE

Consumer No: WP7012
 Name: GIN WORKS MANAGER GRAPHITE INDIA LTD
 Address: GRAPHITE INDIA LTD. DURGAPUR - 713211
 GSTIN: 19AAACC0457C1Z4

Invoice No: DPL/W/2601/752
 Date: 04/03/2026 Due Date: 18/04/2026
 Bill For: December-January 2026
 Description of Goods: Supply of Water
 HSN Code: 220190

Sl N	Ref No	Cat	Current Reading	Previous Reading	M/F	Consumption (In KL)	Rate / KL	MN	Arrear (In Rs.)	Refund (In Rs.)	Amount (In Rs.)
1	7012	IP	2947304	2935057	1	12247	46.60	2			570710.00
Total 1 Connections									Taxable Value		570710.00
									Add: CGST @9%		51364.00
									Add: CGST @9%		51364.00
									Total		673438.00

SIX LAKH SEVENTY-THREE THOUSAND FOUR HUNDRED THIRTY-EIGHT ONLY
 CASH RECEIVING HOURS (At New Administrative Building Office):- 10 AM to 4 PM
 (On Full Working Days) & 10AM to 1 PM (On Saturday)

NOTES:

1. If this bill remain unpaid beyond due date as stated above, interest shall be charged @8% per annum on the gross amount of the bill for the number of days from the bill date, till date of actual payment of the bill.
2. Moreover, if the bill is not paid within the due date, the Supplier shall have the right to cut off the supply at any time, thereafter.
3. Please ignore outstanding amount if the payment has already being made and inform the same for necessary correction.

*Per day consumption is 182.79 KL/Day -
 7
 14/3/2026*

MIRO..... *D-25/3*
 REVIEWED..... *Acce*

This is computer generated Invoice. No Signature is required.

Sr Manager / Manager
 (Commercial)

----- Tear off Here -----

The Durgapur Projects Limited
GSTIN: 19AABCT0595M1ZU
WATER BILL

(DPL's Copy)

Consumer: GIN WORKS MANAGER GRAPHITE INDIA LTD (WP7012)
 Bill For: December-January 2026 Amount: Rs. 673438.00
 Interest charged for payment after due date from bill date @ Rs. 147.6028 per day
 GST will be applicable on surcharge @ Rs. 26.5685 per day

Bill Date: 04/03/2026
 Due Date: 18/04/2026

This is computer generated Invoice. No Signature is required.

Sr Manager / Manager
 (Commercial)

190005932

TAX INVOICE

Consumer No: WP7012

Name: GIN WORKS MANAGER GRAPHITE INDIA LTD

Address: GRAPHITE INDIA LTD. DURGAPUR - 713211

Invoice No: DPL/W/2603/7

Date: 31/03/2026

Due Date: 15/05/2026

Bill For: February-March 2026

Description of Goods: Supply of Water

HSN Code: 22011

GSTIN: 19AAACC0457C1Z4

Sl N	Ref No	Cat	Current Reading	Previous Reading	M/F	Consumption (In KL)	Rate / KL	MN	Arrear (In Rs.)	Refund (In Rs.)	Amot (In Rs.)
1	7012	IP	2958707	2947304	1	11403	46.60	2			531379.8

Total 1 Connections

Taxable Value	531379.8
Add: CGST @9%	47824.18
Add: GGST @9%	47824.18

SIX LAKH TWENTY-SEVEN THOUSAND TWENTY-EIGHT AND SIXTEEN PAISE
CASH RECEIVING HOURS (At New Administrative Building Office):- 10 AM to 4 PM
(On Full Working Days) & 10AM to 1 PM (On Saturday)

Total 627028.16

NOTES:

1. If this bill remain unpaid beyond due date as stated above, interest shall be charged @8% per annum on the gross amount of the bill for the number of days from the bill date, till date of actual payment of the bill.
2. Moreover, if the bill is not paid within the due date, the Supplier shall have the right to cut off the supply at any time, thereafter.
3. Please ignore outstanding amount if the payment has already being made and inform the same for necessary correction.

Prev Dues	673438.0
Curr Bill	627028.16
Total Due	1300466.1

(Plus Interest as applicable)

REVIEWED

This is computer generated Invoice. No Signature is required.

Sr Manager / Manager
(Commercial)

Tear off Here

The Durgapur Projects Limited
GSTIN: 19AABCT0595M1ZU
WATER BILL

(DPL's Copy)

Consumer: GIN WORKS MANAGER GRAPHITE INDIA LTD

(WP7012)

Bill Date: 31/03/2026

Bill For: February-March 2026

Amount: Rs. 627028.16

Due Date: 15/05/2026

Interest charged for payment after due date from bill date @ Rs.

137.4308 per day

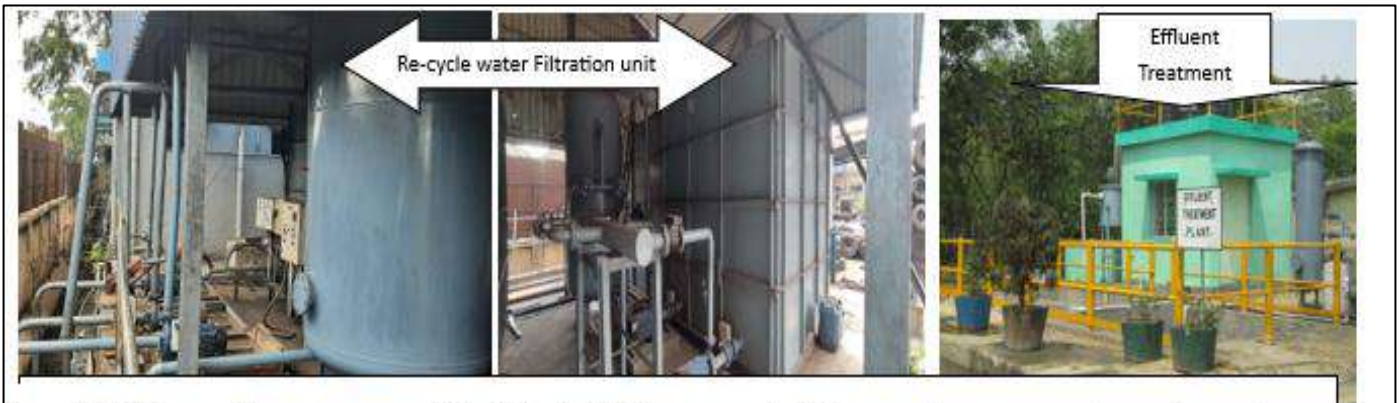
GST will be applicable on surcharge @ Rs.

24.7375 per day

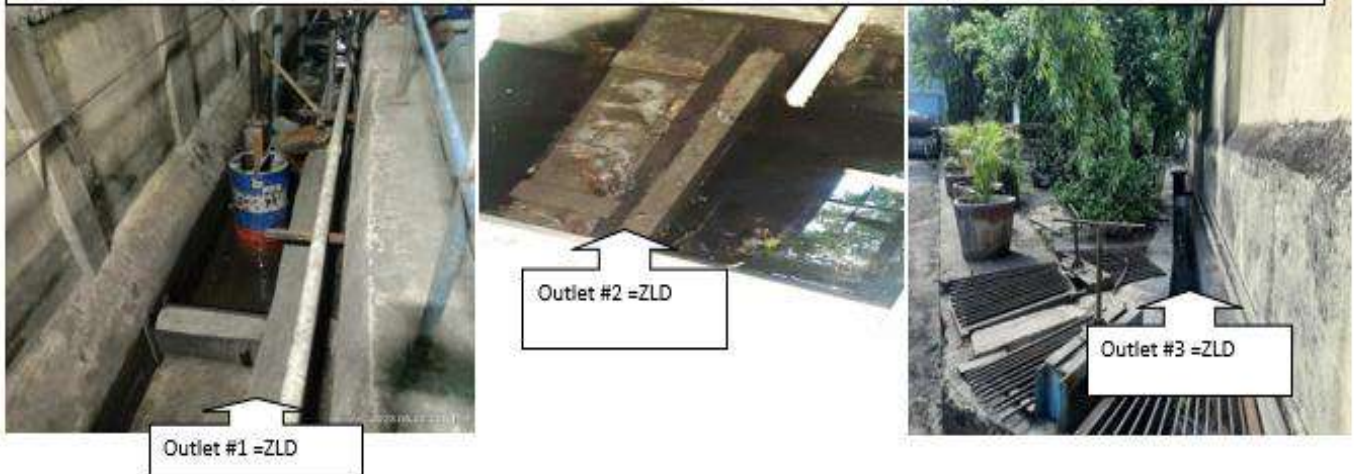
This is computer generated Invoice. No Signature is required.

Sr Manager / Manager
(Commercial)

ETP & WWTP UNITS



Filtration unit & Effluent Treatment plant



Zero Liquid Discharge in three plant outlets





WEST BENGAL POLLUTION CONTROL BOARD

(Department of Environment, Govt. of West Bengal)

Paribesh Bhawan

Bldg. No. 10 A, Block-LA, Sector-III, Bidhan Nagar,

Kolkata – 700 098

Tel : 0091 (033) 2335-9088 / 8861 / 8211 / 8073 / 6731

2335-0261 / 8212 / 8213 / 7428 / 5975

Fax : 0091 (033) 2335 6730 / 2813

Website : www.wbpcb.gov.in, e-mail : wbpcbnet@wbpcb.gov.in

Memo No. 114 /2S (HW) –598/99-2000 (Pt-I)

Date: 16.06.2022

FORM 2

Grant of Authorization under the provisions of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Ref.: Application authorization dated 30.07.2021 for management & handling of Hazardous & Other Waste (Management & Transboundary) Rules, 2016 and its amendment thereafter.

M/s. Graphite India Limited

Sagarbhanga, Durgapur, P.S.: Coke Oven, Paschim Bardhaman-713211 is hereby granted an authorisation for generation, collection, reception, storage, transport, reuse, recycling, recovery, pre-processing, co-processing, utilisation, treatment, disposal, or any other use of hazardous or other wastes or both on the Sagarbhanga, Durgapur, P.S.: Coke Oven, Paschim Bardhaman-713211.

Details of Authorisation:

Sl. no.	Category of Hazardous Waste as per the Schedule I, II and III of these rules	Authorised mode of disposal or recycling or utilization or co-processing etc.	Quantity (MT/ per year)
1.	5.1	Recycling through authorized recyclers.*	13.97 KL
2.	5.2	Disposal to CHWTSDF. *	16.17
3.	3.3	Recycling through authorized recyclers.*	14.39 KL
4.	B1	Disposal to CHWTSDF. *	5.34
5.	33.1	Recycling through authorized recyclers.*	1.55
6.	35.1	Recycling through authorized recyclers / Disposal to CHWTSDF. *	214.90
7.	35.3	Disposal to CHWTSDF. *	3.88

* For detail refer to Specific Conditions.

(1) Authorization shall be valid for a period upto 30.04.2026 with effect from the date of issue

(2) The authorization is subject to the following general and specific conditions:

[Signature]
[Chief Engineer]
West Bengal Pollution Control Board

Chief Engineer
W. B. Pollution Control Board
Dept. of Environment, Govt. of W.B.

A. General conditions of authorization:

1. The authorised person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the State Pollution Control Board.
3. The person authorised shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorisation.
4. Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.
5. The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time;
6. The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on "Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty"
7. It is the duty of the authorised person to take prior permission of the State Pollution Control Board to close down the facility.
8. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
9. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
10. The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilisation of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorisation.
11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorisation shall be three months before the expiry of such authorisation.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. Annual return shall be filed by June 30th every year for the period ending 31st March of that year.


B. Specific conditions:

1. The unit shall store the hazardous wastes (category wise separately) under shade in an environment friendly safe manner within the premises at designated places and the unit shall not store hazardous waste on site for more than 90 days.
2. Waste containing oil (5.2), ETP sludge (35.3) and discarded asbestos (B1) shall be disposed to the CHWTSDF through Manifest system (Form-10).
3. Used oil (5.1), oily sludge (3.3), ESP tarry residue (35.1) and contaminated drums shall be sold through manifest system (Form 10) to the authorized recyclers having valid authorization of the State Pollution Control Board. During each sale, original Pass-book issued by SPCB to the authorized recyclers shall be endorsed mentioning

the quantity and copy of the same shall be kept as record. If not fit for recycling shall be sent to CHWTSDF facility with manifest system.

4. The unit shall submit copies of Form 10 to the State Board on a regular basis.
5. Transport of hazardous and other waste shall be in accordance with the Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016, guidelines issued by the Central Pollution Control Board (CPCB) and rules made under the Motor Vehicle's Act, 1988. The responsibility of safe transport shall be either of the sender or the receiver whosoever arranges the transport and this responsibility shall be clearly indicated in the Manifest.
6. Records of hazardous waste generation, storage and disposal shall be maintained properly as form 3 of Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016, and shall be available to the inspecting officials of the State Board during inspection.
7. The unit shall update regularly the environmental information in Display Boards as per the order of the Hon'ble Supreme Court dated. 14.10.2003 in W.P.(C) NO.657 of 1995.
8. Authorisation will be revoked in case of non-compliances with any of the above conditions.

M/s. Graphite India Limited
Sagarbanga, Durgapur, P.S.: Coke Oven,
Paschim Bardhaman-713211


[Chief Engineer]
West Bengal Pollution Control Board
Chief Engineer
W. B. Pollution Control Board
Dept. of Environment, Govt. of W.B.



सत्यमेव जयते

Government of West Bengal

This document having UDIN **26-G-GA000004-A-1779098628909** has been created by **WEST BENGAL POLLUTION CONTROL BOARD** with authorised person's Aadhaar no XXXXXXXX4130 on **3:33PM, May 18, 2026**

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सत्यमेव जयते



Gibansu Mukherjee

Authorised Signatory
(E-signed)
Department of IT&E

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WEST BENGAL POLLUTION CONTROL BOARD
Paribesh Bhawan, 10A, Block LA, Sector III
Salt Lake City, Bidhan Nagar, Kolkata – 700 106, INDIA
 Website : www.wbpcb.gov.in, e-mail : wbpnet@wbpcb.gov.in

Ref No. - WBPCB/8403815/2026

Dated:- 18/05/2026

FORM 2

Grant of Authorization under the provisions of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Ref.: Application number 8403815 (date-15/05/2026) for management & handling of Hazardous waste under Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016 and its amendment thereafter.

M/s. GRAPHITE INDIA LIMITED of SagarBhanga, Durgapur is hereby granted an authorisation for Generation, Storage, Disposal of Hazardous waste on the premises situated at SagarBhanga, Durgapur

Details of Authorisation

Sl.No.	Category of Hazardous Waste as per the Schedules I, II and III of these rules	Authorised mode of disposal or recycling or utilisation or co-processing, etc.*	Quantity(ton/annum)
1	5.1	recycling through authorized recyclers	18
2	5.2	CHWTSDF Facility	20.83
3	3.3	recycling through authorized recyclers/CHWTSDF Facility	18.5
4	B1	CHWTSDF Facility	6.89
5	33.1	recycling through authorized recyclers/CHWTSDF Facility	2
6	35.3	CHWTSDF Facility	5
7	35.1	recycling through authorized recyclers	480.9
8	35.2	CHWTSDF Facility	0.25
9	36.2	CHWTSDF Facility	0.15

*** For detail refer to Specific Conditions:**

- (1) The authorisation shall be valid for a period upto **30/04/2031** with effect from the date of issue.
- (2) The authorisation is subject to the following general and specific conditions (Please specify any conditions that need to be imposed over and above general conditions, if any):

A General conditions of authorisation:

1. The authorised person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorisation or its renewal shall be produced for inspection at the request of an officer authorised by the State Pollution Control Board.
3. The person authorised shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this authorisation.

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Page 1



4. Any unauthorised change in personnel, equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of his authorisation.
5. The person authorised shall implement Emergency Response Procedure (ERP) for which this authorisation is being granted considering all site specific possible scenarios such as spillages, leakages, fire etc. and their possible impacts and also carry out mock drill in this regard at regular interval of time.
6. The person authorised shall comply with the provisions outlined in the Central Pollution Control Board guidelines on “Implementing Liabilities for Environmental Damages due to Handling and Disposal of Hazardous Waste and Penalty”
7. It is the duty of the authorised person to take prior permission of the State Pollution Control Board to close down the facility.
8. The imported hazardous and other wastes shall be fully insured for transit as well as for any accidental occurrence and its clean-up operation.
9. The record of consumption and fate of the imported hazardous and other wastes shall be maintained.
10. The hazardous and other waste which gets generated during recycling or reuse or recovery or pre-processing or utilisation of imported hazardous or other wastes shall be treated and disposed of as per specific conditions of authorisation.
11. The importer or exporter shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorisation shall be made as laid down under these Rules.
13. Any other conditions for compliance as per the Guidelines issued by the Ministry of Environment, Forest and Climate Change or Central Pollution Control Board from time to time.
14. Annual return shall be filed by June 30th for the period ensuring 31st March of the year.

B Specific conditions:

1. The unit shall store the hazardous wastes (category wise separately) under shade in an environment friendly safe manner within the premises at designated places and the unit shall not store hazardous waste on site for more than 90 days.
2. ETP sludge (35.3), Spent ion-exchange resin (35.2), Discarded asbestos (B1), Waste & residues containing oil (5.2), Used/discarded oil filters (36.2), Contaminated cartons/bags/liners/other packaging material (33.1), shall be disposed to the Common Hazardous Waste Treatment Storage Disposal Facility (CHWTSDF), West Bengal through Manifest system (Form-10).
3. Coal tar sludge (35.1), Oily sludge (3.3), Used oil (5.1), Contaminated containers/drums (33.1) shall be disposed thorough recycler/utilizer authorized by the Sate Pollution Control Board through manifest system (Form-10). During each sale, original Pass-book issued by SPCB to the authorized recyclers shall be endorsed mentioning the quantity and copy of the same shall be kept as record. No recyclable waste shall be sent to Common Hazardous Waste Treatment Storage Disposal Facility (CHWTSDF). However, if not fit for recycling at all shall be disposed to Common Hazardous Waste Treatment Storage Disposal Facility (CHWTSDF) West Bengal with manifest system (Form-10).
4. The unit shall submit copies of Form 10 to the State Board on a regular basis.
5. Transport of hazardous and other waste shall be in accordance with the Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016, guidelines issued by the Central Pollution Control Board (CPCB) and rules made under the Motor Vehicles Act, 1988. The responsibility of safe transport shall be either of the sender or the receiver whosoever arranges the transport and this responsibility shall be clearly indicated in the Manifest.
6. Records of hazardous waste generation, storage and disposal shall be maintained properly in Form-3 as per Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016 and shall be available to the inspecting officials of the State Board during inspection.
7. Hazardous waste storage area shall be improved.
8. The unit shall register in the centralized portal (<https://nhwts.nic.in/nhwtsweb>) of National Hazardous Waste

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Page2



Tracking System.

9.The unit shall update regularly the environmental information in Display Boards as per the order of the Hon'ble Supreme Court dated. 14.10.2003 in W.P.(C) NO.657 of 1995.

10.Authorisation will be revoked in case of non-compliances with any of the above conditions.



18/05/2026

Chief Engineer
Waste Management Cell



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WBPCB/8403815/2026

Page3



LDAR Protocol

LDAR (Leak Detection and Repair) is a crucial process designed to identify, monitor, and fix leaks of volatile organic compounds (VOCs) from various industrial sources. It's not just about compliance; it's about safeguarding employees, protecting surrounding communities, reducing product loss, and minimizing harmful emissions.

Leaks can originate from a variety of equipment components within a facility. Understanding these common sources is the first step in effective leak prevention:

- Pumps: Often, leaks are a result of a failed or improperly placed pump seal.
- Valves: These commonly leak at the stem or gland area due to a failure in the valve packing or O-ring.
- Connectors: Gasket failure and improperly torqued bolts on flanges are typical culprits for leaks in connectors.
- Sampling Connectors: Leaks usually occur at the outlet of the sampling valve when the sampling line is purged to obtain a sample.
- Compressors: The seal is the most frequent point of leakage in compressors.
- Pressure Relief Valves (PRVs): A PRV can leak if it's not properly seated, operating too close to its set point, or if the seal is worn or damaged. Rupture disks can also leak around the disk gasket if not installed correctly.
- Open-Ended Lines (OELs): Leaks occur where the line is open to the atmosphere and are typically controlled using caps, plugs, and flanges. Incorrect implementation of the block and bleed procedure can also lead to OEL leaks.

Flammable Chemicals at Graphite India Limited

Graphite India Limited handles and stores several flammable chemicals and gases, which makes a robust LDAR program even more critical. These include:

- Coal Bed Methane (CBM)
- High Speed Diesel (HSD)
- Liquefied Petroleum Gas (LPG)
- Furnace Oil
- Impregnation Pitch (Coal Tar Pitch)

The Core Elements of an Effective LDAR Process

A comprehensive LDAR program involves several key stages, each vital for successful leak management:

Identifying Components

This foundational step ensures all potential leak sources are accounted for:

- Unique ID Assignment: Each regulated component and piece of equipment in pipelines carrying relevant materials must be assigned a unique identification (ID) number.

- Detailed Logging: Maintain a log that meticulously records each regulated component, equipment, and its unique ID number.
- Physical Verification: Physically locate each component and equipment within the facility. Verify its location against Piping and Instrumentation Diagrams (P&IDs) or process flow diagrams, updating the log as needed.
- Site Plot Plan Identification: Clearly identify each regulated component and equipment on a site plot plan or a continuously updated equipment log.
- Dynamic Record Keeping: Promptly note in the equipment log when new and replacement components are added, and when equipment is taken out of service.
- Regular Field Inspections: Periodically perform field inspections to ensure that lists and diagrams accurately reflect the equipment installed in the plant.

Leak Definition

- To effectively monitor and repair, a clear definition of a leak is essential:
- Measurement in PPM: Emissions from regulated components and equipment must be measured in Parts per million (PPM).
- Internal Leak Definition: Use a consistent internal leak definition for valves and pumps in light liquid or gas vapor service, and monitor against this uniform definition.

Monitoring Components

- This involves the regular inspection of identified components:
- Portable Instrument Use: Regulated components and equipment are monitored using portable instruments.
- Obstruction Removal: Eliminate any obstructions (e.g., grease on the component interface) that could prevent accurate monitoring.
- QA/QC of Data: Perform Quality Assurance/Quality Control (QA/QC) on LDAR data to ensure its accuracy, completeness, and to check for inconsistencies.

Repairing Components

- Timely and effective repair is crucial to reducing emissions:
- Prompt Repair: Repair leaking components as soon as practically possible.
- Repair Plan and Timetable: Develop a clear plan and timetable for repairing components.
- Repair Deadlines: Make a first attempt at repair within five days of leak detection and complete a final repair within fifteen days.
- Delay of Repair List: Any component that cannot be repaired within these timeframes must be placed on a Delay of Repair list and scheduled for repair during the next shutdown cycle.
- First Attempt Practices: Practicable and appropriate first attempts at repair include:
- Tightening bonnet bolts

- Replacing bonnet bolts
- Tightening packing gland nuts
- Injecting lubricant into lubricated packing
- Technically Infeasible Repairs: If a repair is technically infeasible without a process unit shutdown, the component can be placed on the Delay of Repair list. The ID number, an explanation for the delay, and an estimated repair date must be recorded.

Record Keeping

Meticulous record-keeping is vital for demonstrating compliance and tracking progress:

For Each Regulated Process:

- A list of all ID numbers is maintained for all equipment subject to equipment leak regulation.
- For valves designated as “unsafe to monitor,” a list of ID numbers and an explanation/review of the conditions for the designation are maintained.
- Detailed schematics, equipment design specifications (including dates and descriptions of any changes), and piping and instrumentation diagrams are maintained.
- Results of performance testing and leak detection monitoring, including leak monitoring results per the leak frequency, monitoring leakless equipment, and non-periodic event monitoring are/ will be maintained.

For Leaking Equipment if any:

- ID tags to the equipment are attached.
- Records of the equipment ID number, the instrument and operator ID numbers, and the date the leak was detected are maintained.
- A list of the dates of each repair attempt and an explanation of the attempted repair method is maintained.
- The dates of successful repairs are noted.
- The results of monitoring tests if any are included to determine if the repair was successful.

By adhering to these comprehensive LDAR principles, Graphite India Limited is significantly reducing/will significantly reduce their environmental impact, enhance safety, and improve operational efficiency.

INDICATIVE CONSULTANT INDIA Form No. - 30 Table No. - 1
 HPL Link Road, Basudevpur, Khanjanchak, Haldia, Purba Medinipur-721602 Ph.: 03224- 275765
 MSME Reg. No.: WB-12-0000228 Mob. - 94340 17584
 e-mail : jayantasarkar67@gmail.com/indicativeconsultantindia@gmail.com

M/s. GRAPHITE INDIA LTD.
 Address: District – Paschim Bardhaman, Durgapur, PIN -713211, West Bengal

- RESULT OF WORK ZONE MONITORING:-**
1. Name of the Department/Plant: **BAKING RH # 24 (III)**
 2. Raw materials, by-products and finished products: -
 3. Particular of Sampling: - Respirable dust sampler

Location / Operation monitoring	Identified contaminants	Date & Time of Monitoring	Air Contaminants	TWA Concentration as given in Factory's Act : 2 nd Schedule (mg/M ³)	Sampling Instrument used and Reference method	Remark	Signature	Name (in block letters)
BAKING RH # 24 (III)	Methyl Alcohol (as CH ₃ OH)	12.02.2026	<0.1	260	See Annexure-1	Below PEL	[Signature]	A. BHATTACHARYA
	Ethyl Alcohol (as C ₂ H ₅ OH)		<0.1	1900		Below PEL		
	Formic Acid (as HCOOH)		<0.05	9		Below PEL		
	Benzene (as C ₆ H ₆)	10:30 AM to 06:30 PM	<0.05	20		Below PEL	[Signature]	S. CHATTARAJ
	Toluene (as C ₆ H ₅ CH ₃)		<0.05	375		Below PEL		

PEL - Permissible Exposure Limit.

For, INDICATIVE CONSULTANT INDIA



INDICATIVE CONSULTANT INDIA Form No. - 30 Table No. - 2
 HPL Link Road, Basudevpur, Khanjanchak, Haldia, Purba Medinipur-721602 Ph.: 03224- 275765
 MSME Reg. No.: WB-12-0000228 Mob. - 94340 17584
 e-mail : jayantasarkar67@gmail.com/indicativeconsultantindia@gmail.com

M/s. GRAPHITE INDIA LTD.
 Address: District – Paschim Bardhaman, Durgapur, PIN -713211, West Bengal

- RESULT OF WORK ZONE MONITORING:-**
1. Name of the Department/Plant: **RIED HAMMER 24 (I) SECTION SHOP**
 2. Raw materials, by-products and finished products: -
 3. Particular of Sampling: - Respirable dust sampler

Location / Operation monitoring	Identified contaminants	Date & Time of Monitoring	Air Contaminants	TWA Concentration as given in Factory's Act : 2 nd Schedule (mg/M ³)	Sampling Instrument used and Reference method	Remark	Signature	Name (in block letters)
RIED HAMMER 24 (I) SECTION SHOP	Methyl Alcohol (as CH ₃ OH)	12.02.2026	<0.1	260	See Annexure-1	Below PEL	[Signature]	A. BHATTACHARYA
	Ethyl Alcohol (as C ₂ H ₅ OH)		<0.1	1900		Below PEL		
	Formic Acid (as HCOOH)		<0.05	9		Below PEL		
	Benzene (as C ₆ H ₆)	09:30 AM to 05:30 PM	<0.05	20		Below PEL	[Signature]	S. CHATTARAJ
	Toluene (as C ₆ H ₅ CH ₃)		<0.05	375		Below PEL		

PEL - Permissible Exposure Limit.

For, INDICATIVE CONSULTANT INDIA



INDICATIVE CONSULTANT INDIA

HPL Link Road, Basudevapur, Khanjanchak, Haldia, Purba Medinipur-721602
MSME Reg. No.: WB-12-0000228

Form No. - 30

Table No. - 3

Ph.: 03224- 275765

Mob. - 94340 17584

e-mail : jayantasarkar67@gmail.com/indicativeconsultantindia@gmail.com

M/s. GRAPHITE INDIA LTD.

Address: District - Paschim Bardhaman, Durgapur, PIN -713211, West Bengal

RESULT OF WORK ZONE MONITORING:-

- Name of the Department/Plant: **BAKING TUNNEL KILN SHOP**
- Raw materials, by-products and finished products: -
- Particular of Sampling: - Respirable dust sampler

Location / Operation monitoring	Identified contaminants	Date & Time of Monitoring	Air Contaminants	TWA Concentration as given in Factory's Act : 2 nd Schedule (mg/M ³)	Sampling Instrument used and Reference method	Remark	Signature	Name (in block letters)
BAKING TUNNEL KILN SHOP	Methyl Alcohol (as CH ₃ OH)	11.02.2026	<0.1	260	See Annexure-1	Below PEL	[Signature]	A. BHATTACHARYA
	Ethyl Alcohol (as C ₂ H ₅ OH)		<0.1	1900		Below PEL		
	Formic Acid (as HCOOH)	09:00 AM to 05:00 PM	<0.05	9		Below PEL	[Signature]	S. CHATTARAJ
	Benzene (as C ₆ H ₆)	<0.05	20	Below PEL				
	Toluene (as C ₆ H ₅ CH ₃)	<0.05	375	Below PEL				

PEL - Permissible Exposure Limit.

For, INDICATIVE CONSULTANT INDIA



INDICATIVE CONSULTANT INDIA

HPL Link Road, Basudevapur, Khanjanchak, Haldia, Purba Medinipur-721602
MSME Reg. No.: WB-12-0000228

Form No. - 30

Table No. - 4

Ph.: 03224- 275765

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e-mail : jayantasarkar67@gmail.com/indicativeconsultantindia@gmail.com

M/s. GRAPHITE INDIA LTD.

Address: District - Paschim Bardhaman, Durgapur, PIN -713211, West Bengal

RESULT OF WORK ZONE MONITORING:-

- Name of the Department/Plant: **P.L. UNIT - 2 SHOP**
- Raw materials, by-products and finished products: -
- Particular of Sampling: - Respirable dust sampler

Location / Operation monitoring	Identified contaminants	Date & Time of Monitoring	Air Contaminants	TWA Concentration as given in Factory's Act : 2 nd Schedule (mg/M ³)	Sampling Instrument used and Reference method	Remark	Signature	Name (in block letters)
P.L. UNIT - 2 SHOP	Methyl Alcohol (as CH ₃ OH)	13.02.2026	<0.1	260	See Annexure-1	Below PEL	[Signature]	A. BHATTACHARYA
	Ethyl Alcohol (as C ₂ H ₅ OH)		<0.1	1900		Below PEL		
	Formic Acid (as HCOOH)	08:20 AM to 04:20 PM	<0.05	9		Below PEL	[Signature]	S. CHATTARAJ
	Benzene (as C ₆ H ₆)	<0.05	20	Below PEL				
	Toluene (as C ₆ H ₅ CH ₃)	<0.05	375	Below PEL				

PEL - Permissible Exposure Limit.

For, INDICATIVE CONSULTANT INDIA



INDICATIVE CONSULTANT INDIA Form No. - 30 Table No. - 5 Ph.: 03224- 275765
 HPL Link Road, Basudevpur, Khanjanchak, Haldia, Purba Medinipur-721602 Mob. - 94340 17584
 MSME Reg. No.: WB-12-0000228 e-mail : jayantasarkar67@gmail.com/indicativeconsultantindia@gmail.com

M/s. GRAPHITE INDIA LTD.
 Address: District – Paschim Bardhaman, Durgapur, PIN -713211, West Bengal

- RESULT OF WORK ZONE MONITORING:-**
1. Name of the Department/Plant: **ACHESON FURNACE SHOP**
 2. Raw materials, by-products and finished products: -
 3. Particular of Sampling: - Respirable dust sampler

Location / Operation monitoring	Identified contaminants	Date & Time of Monitoring	Air Contaminants	TWA Concentration as given in Factory's Act :2 nd Schedule (mg/M ³)	Sampling Instrument used and Reference method	Remark	Signature	Name (in block letters)
ACHESON FURNACE SHOP	Methyl Alcohol (as CH ₃ OH)	17.02.2026	<0.1	260	See Annexure-1	Below PEL	[Signature]	A. BHATTACHARYA
	Ethyl Alcohol (as C ₂ H ₅ OH)		<0.1	1900		Below PEL		
	Formic Acid (as HCOOH)		<0.05	9		Below PEL		
	Benzene (as C ₆ H ₆)	10:10 AM to 06:10 PM	<0.05	20		Below PEL	[Signature]	S. CHATTARAJ
	Toluene (as C ₆ H ₅ CH ₃)		<0.05	375		Below PEL		

PEL – Permissible Exposure Limit.

For, INDICATIVE CONSULTANT INDIA



INDICATIVE CONSULTANT INDIA Form No. - 30 Table No. - 6 Ph.: 03224- 275765
 HPL Link Road, Basudevpur, Khanjanchak, Haldia, Purba Medinipur-721602 Mob. - 94340 17584
 MSME Reg. No.: WB-12-0000228 e-mail : jayantasarkar67@gmail.com/indicativeconsultantindia@gmail.com

M/s. GRAPHITE INDIA LTD.
 Address: District – Paschim Bardhaman, Durgapur, PIN -713211, West Bengal

- RESULT OF WORK ZONE MONITORING:-**
1. Name of the Department/Plant: **LWG – 4 SHOP**
 2. Raw materials, by-products and finished products: -
 3. Particular of Sampling: - Respirable dust sampler

Location / Operation monitoring	Identified contaminants	Date & Time of Monitoring	Air Contaminants	TWA Concentration as given in Factory's Act :2 nd Schedule (mg/M ³)	Sampling Instrument used and Reference method	Remark	Signature	Name (in block letters)
LWG - 4 SHOP	Methyl Alcohol (as CH ₃ OH)	14.02.2026	<0.1	260	See Annexure-1	Below PEL	[Signature]	A. BHATTACHARYA
	Ethyl Alcohol (as C ₂ H ₅ OH)		<0.1	1900		Below PEL		
	Formic Acid (as HCOOH)		<0.05	9		Below PEL		
	Benzene (as C ₆ H ₆)	08:00 AM to 04:00 PM	<0.05	20		Below PEL	[Signature]	S. CHATTARAJ
	Toluene (as C ₆ H ₅ CH ₃)		<0.05	375		Below PEL		

PEL – Permissible Exposure Limit.

For, INDICATIVE CONSULTANT INDIA



Photographs of Oil catchers



Oil Skimmer PI Area Drain pit



Oil skimmer at Main Outlet



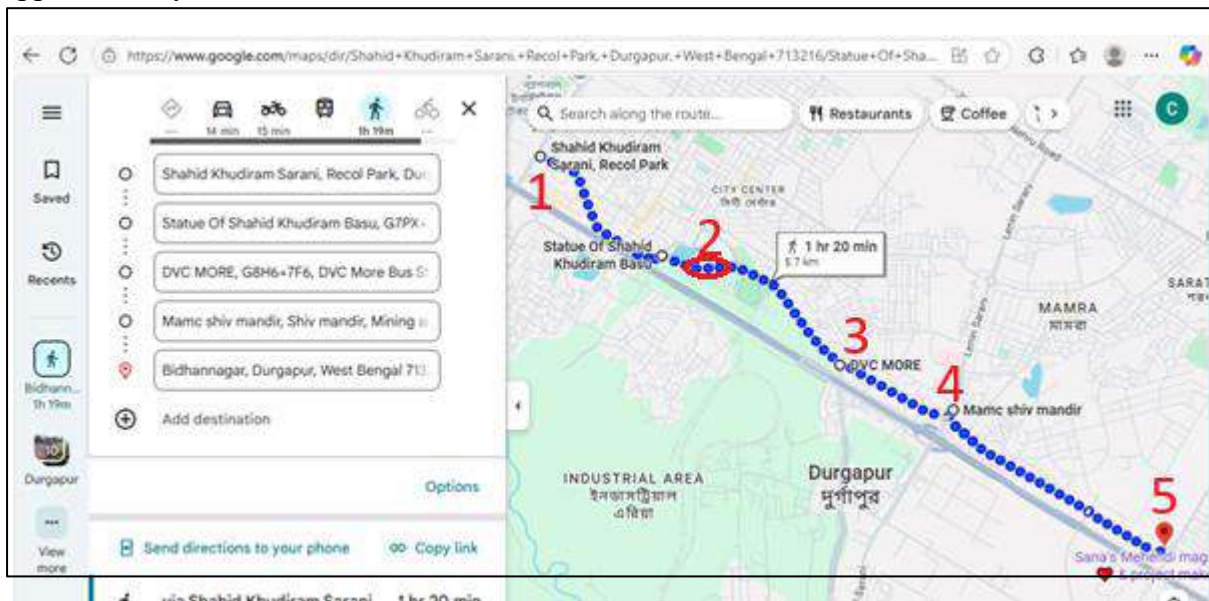
Oil skimmer at Canteen Drain pit

Avenue Plantation done during the Dec 25 to Mar26 period

In Stretch -1 Map enclosed

Avenue plantation has been carried out along the central road median in Stretch-1 in consultation with Asansol Durgapur Development Authority as per their letter dated 24.06.2025. Photographic evidence of the plantation is enclosed (Photographs 1 to 4). A 220 m stretch, as marked in the enclosed map, has been excluded from plantation.

A total of 720 Foxy Tail Palm saplings (372 + 348) has been planted along the central median till March,2026. The plantation covers an effective road length of 3,480 m (3,700 m excluding the 220 m stretch) with a plantation width of 0.75 m, resulting in a total green cover area of approximately 0.26 ha.



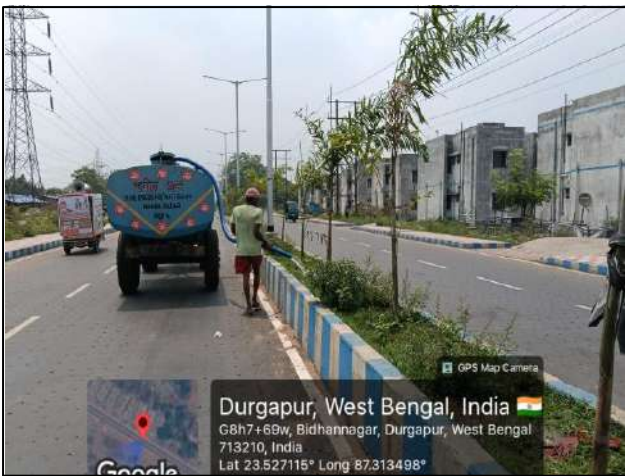


Photo graphs of Mock drills & Fire Safety Training





Fire Water Tank



Fire Extinguishers

Existing Online Monitoring Stack Report

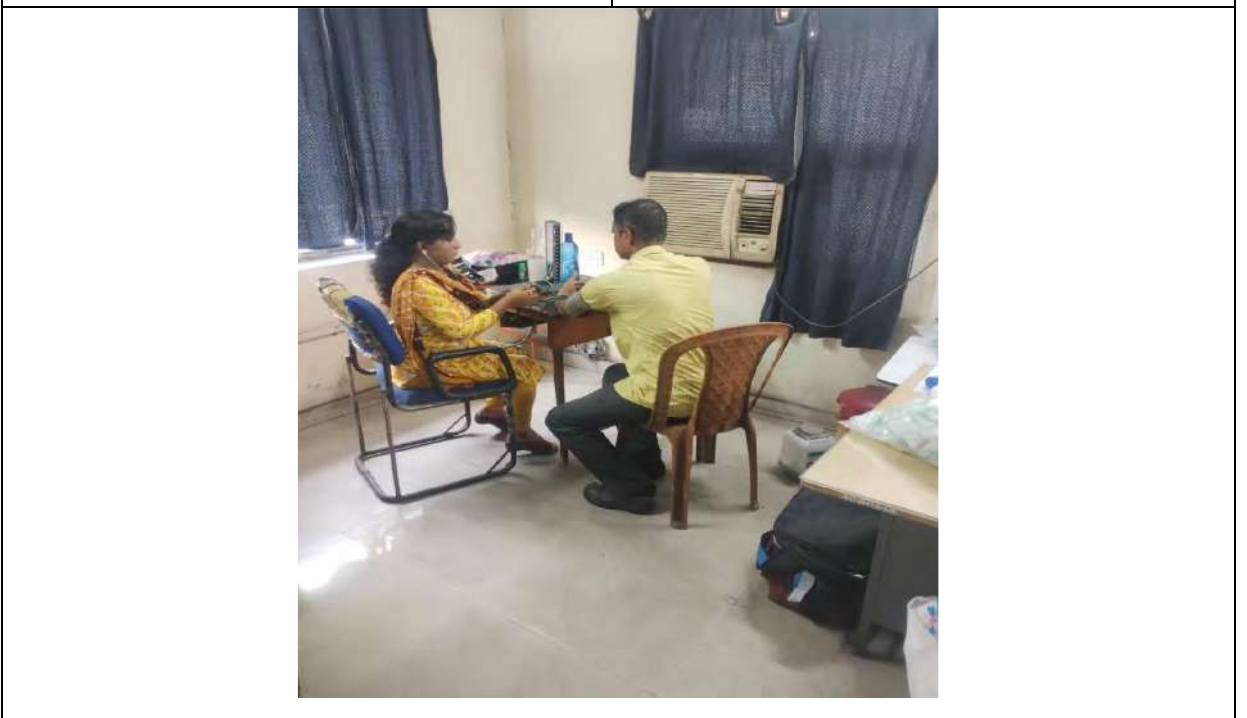
Device ID	ENE02510		
Alias	CEMS (RH-24-3)		
Duration	2025-12-01 to 2026-03-31		
Device Coordinates	23.4906759, 87.3343805		
Device Location	Durgapur Graphite India Limited, SagarBhanga Durgapur 713211		
Time Stamp	NOx (mg/nm3)	SOx (mg/nm3)	Suspended Particulate Mat (mg/Nm3)
01-12-2025	59.16	0.00	21.05
02-12-2025	61.98	0.00	21.34
03-12-2025	58.52	0.00	21.82
04-12-2025	58.47	0.00	21.19
05-12-2025	59.28	0.00	21.38
06-12-2025	58.81	0.00	21.58
07-12-2025	59.16	0.00	21.35
08-12-2025	58.67	0.00	21.69
09-12-2025	58.71	0.00	21.56
10-12-2025	58.57	0.00	20.70
11-12-2025	58.98	0.00	21.68
12-12-2025	58.83	0.00	21.38
13-12-2025	58.69	32.98	21.79
14-12-2025	57.63	77.93	21.31
15-12-2025	59.27	78.12	20.90
16-12-2025	58.71	77.76	21.00
17-12-2025	58.10	77.94	21.44
18-12-2025	57.59	77.30	21.47
19-12-2025	57.35	78.51	21.54
20-12-2025	58.83	77.91	21.60
21-12-2025	58.58	79.40	21.36
22-12-2025	58.64	77.41	21.28
23-12-2025	59.31	78.17	21.95
24-12-2025	58.56	78.70	21.86
25-12-2025	58.38	79.28	20.83
26-12-2025	58.14	78.12	21.07
27-12-2025	58.27	78.97	21.90
28-12-2025	58.49	77.84	21.83
29-12-2025	58.52	78.11	20.86
30-12-2025	58.45	78.30	22.35
31-12-2025	58.15	78.88	21.47
01-01-2026	58.44	79.44	21.51
02-01-2026	58.34	78.98	22.22
03-01-2026	58.41	78.44	21.48

04-01-2026	57.23	76.70	21.80
05-01-2026	58.23	78.39	20.98
06-01-2026	57.91	78.61	21.56
07-01-2026	58.16	78.69	21.53
08-01-2026	58.69	78.55	21.53
09-01-2026	58.62	79.03	21.71
10-01-2026	59.34	77.44	20.89
11-01-2026	58.03	78.42	21.26
12-01-2026	57.13	77.21	21.66
13-01-2026	57.69	78.26	21.33
14-01-2026	58.34	78.75	21.40
15-01-2026	58.03	78.23	21.03
16-01-2026	58.43	77.88	21.64
17-01-2026	57.67	78.53	21.46
18-01-2026	58.45	77.79	21.51
19-01-2026	58.59	78.38	21.07
20-01-2026	58.18	78.13	21.78
21-01-2026	57.52	77.38	21.89
22-01-2026	57.86	77.84	21.87
23-01-2026	58.60	78.07	21.63
24-01-2026	57.60	79.34	21.39
25-01-2026	58.80	78.29	21.50
26-01-2026	58.07	78.19	21.02
27-01-2026	58.54	78.06	21.68
28-01-2026	58.65	78.27	21.62
29-01-2026	58.11	78.67	21.40
30-01-2026	59.57	77.23	21.57
31-01-2026	58.17	78.37	21.24
01-02-2026	57.24	77.21	21.98
02-02-2026	58.38	78.21	21.80
03-02-2026	57.67	78.79	20.90
04-02-2026	58.36	78.21	21.27
05-02-2026	58.57	78.07	21.62
06-02-2026	58.03	78.85	20.86
07-02-2026	57.76	78.05	21.30
08-02-2026	58.80	77.29	21.83
09-02-2026	58.04	78.61	21.98
10-02-2026	58.34	78.82	21.41
11-02-2026	58.50	78.79	21.35
12-02-2026	58.82	78.57	21.38
13-02-2026	58.80	78.23	21.61
14-02-2026	59.18	78.93	21.14
15-02-2026	58.99	78.82	21.46
16-02-2026	59.52	77.97	21.59
17-02-2026	58.95	77.58	20.91

18-02-2026	58.66	78.17	21.70
19-02-2026	57.94	76.06	21.72
20-02-2026	59.13	77.94	21.80
21-02-2026	58.30	78.92	21.23
22-02-2026	58.26	78.44	20.83
23-02-2026	58.48	77.19	21.64
24-02-2026	56.68	78.36	21.38
25-02-2026	58.24	76.43	21.45
26-02-2026	58.57	78.26	22.16
27-02-2026	58.03	78.95	21.70
28-02-2026	58.72	78.43	21.15
01-03-2026	57.03	77.91	21.45
02-03-2026	57.47	77.69	21.54
03-03-2026	58.53	77.86	21.03
04-03-2026	58.41	76.84	20.97
05-03-2026	58.77	77.36	21.24
06-03-2026	57.89	78.76	22.03
07-03-2026	58.31	78.53	21.44
08-03-2026	58.95	78.93	21.20
09-03-2026	58.10	77.88	20.92
10-03-2026	57.54	78.90	21.25
11-03-2026	59.15	77.19	21.63
12-03-2026	56.51	78.92	21.83
13-03-2026	58.28	76.95	21.06
14-03-2026	58.85	77.61	21.89
15-03-2026	58.21	78.15	21.03
16-03-2026	59.00	78.82	21.29
17-03-2026	56.79	77.62	21.66
18-03-2026	58.52	78.11	21.76
19-03-2026	58.29	78.21	21.75
20-03-2026	59.12	77.96	21.86
21-03-2026	58.17	76.16	21.53
22-03-2026	58.95	77.48	21.37
23-03-2026	57.74	78.75	20.74
24-03-2026	59.09	78.57	21.57
25-03-2026	57.16	78.04	21.49
26-03-2026	58.12	77.18	21.41
27-03-2026	58.62	78.46	20.90
28-03-2026	57.75	78.53	21.52
29-03-2026	59.18	78.42	20.62
30-03-2026	58.58	78.41	21.04
31-03-2026	58.05	77.68	21.39

Device ID	ENE05277		
Alias	CEMS (RH-24-2)		
Duration	2025-12-01 to 2026-03-31		
Device Coordinates	23.4906759, 87.3343805		
Device Location	Durgapur		
Time Stamp	NOx (mg/nm3)	SOx (mg/nm3)	Suspended Particulate Mat (mg/Nm3)
20-02-2026	35.83	31.23	20.93
21-02-2026	35.99	31.32	21.42
22-02-2026	36.07	32.70	21.08
23-02-2026	35.40	32.76	21.69
24-02-2026	35.77	31.55	21.55
25-02-2026	35.49	32.86	21.18
26-02-2026	35.18	30.98	21.40
27-02-2026	35.86	31.72	21.54
28-02-2026	36.05	31.52	21.97
01-03-2026	35.10	32.47	21.50
02-03-2026	35.63	31.63	21.40
03-03-2026	35.68	31.56	21.79
04-03-2026	36.11	32.87	21.38
05-03-2026	35.46	31.98	21.30
06-03-2026	35.09	32.31	21.27
07-03-2026	35.77	31.90	21.17
08-03-2026	36.29	31.93	21.31
09-03-2026	35.87	32.77	20.87
10-03-2026	35.52	31.93	21.23
11-03-2026	36.40	31.13	20.99
12-03-2026	35.62	32.09	21.48
13-03-2026	34.88	32.04	21.44
14-03-2026	35.81	32.68	21.46
15-03-2026	36.03	31.56	21.37
16-03-2026	35.81	32.42	21.13
17-03-2026	35.95	31.79	21.41
18-03-2026	35.53	31.74	21.39
19-03-2026	35.52	32.49	21.67
20-03-2026	35.46	32.21	20.86
21-03-2026	36.32	31.47	22.01
22-03-2026	36.54	31.82	21.19
23-03-2026	35.99	31.57	21.12
24-03-2026	35.20	32.80	21.12
25-03-2026	34.88	31.25	21.30
26-03-2026	36.67	32.18	21.34
27-03-2026	35.59	31.97	21.24

28-03-2026	35.52	32.02	21.43
29-03-2026	35.17	31.51	21.49
30-03-2026	36.66	31.09	20.76
31-03-2026	36.10	31.11	21.06



GID-MR-FH-002 R0

wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX											
DURGAPUR, WEST BENGAL																					
REV NO : 02																					
DATE : 10.11.2024																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Extrusion-2										ACTIVITY No: 1.0									
ACTIVITY		Particle generation										SUB ACTIVITY No: 1.1									
SUB ACTIVITY		Coke lifting & storing										SUB ACTIVITY No: 1.1									
JOB TYPE		ROUTINE																			
INPUTS		Raw CPC , Machines , Electricity , Vehicle mounted crane																			
OUTPUT		Store CPC in Silos & HDPE bags																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO	
	Management Programme		Work Instruction																		
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-1.1.1	better upkeep of work place and machineries				WI-EXTN-01	Y				
Hit by moving object	N			Body injury	2	2	4	2	LR	SG	EXT2-1.1.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-01	Y				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section In Charge

[Signature]
Signature of DH

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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-EXTN-HIRA-1.2																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Particle generation											ACTIVITY No: 1.0								
SUB ACTIVITY	Milling Operation											SUB ACTIVITY No: 1.2								
JOB TYPE	ROUTINE																			
INPUTS	Raw CPC , Machines , Electricity , Compressed Air																			
OUTPUT	Screen CPC in Bins																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-1.2.1	better upkeep of work place and machineries				WI-EXTN-01	Y			
Hit by moving object	N			Body injury	2	2	4	2	LR	SG	EXT2-1.2.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-01	Y			
Working in noise prone area	N			Interference in communication Temporary Deafness	1	5	5	2	LR	SG	EXT2-1.2.3	Better upkeep of work place and machineries				WI-EXTN-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section in Charge

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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-1.3																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Particle generation										ACTIVITY No: 1.0									
SUB ACTIVITY	Coke Change over										SUB ACTIVITY No: 1.3									
JOB TYPE	NON ROUTINE																			
INPUTS	Raw CPC , Machines , Electricity , Compressed Air																			
OUTPUT	Screen CPC in Bins & HDPE Bags																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-1.3.1	better upkeep of work place and machineries				WI-EXTN-01	Y			
Hit by moving object	N			Body injury	2	2	4	2	LR	SG	EXT2-1.3.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-01	Y			
Working in noise prone area	N			Interference in communication Temporary Deafness	1	5	5	2	LR	SG	EXT2-1.3.3	Better upkeep of work place and machineries				WI-EXTN-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Rilain Sengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0

wef:25.08.2022

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX											
DURGAPUR, WEST BENGAL																					
REV NO : 02																					
DATE : 10.11.2024										No: GID-EXTN-HIRA-1.4											
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Extrusion-2																			
ACTIVITY		Particle generation										ACTIVITY No: 1.0									
SUB ACTIVITY		CPC feeding on 5A belt conv										SUB ACTIVITY No: 1.4									
JOB TYPE		NON ROUTINE																			
INPUTS		Raw CPC , Machines , Electricity , Vehicle mounted crane , HDPE Bags																			
OUTPUT		Screen CPC in Bins & HDPE Bags																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO	
								Management Programme													Work Instruction
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-1.4.1	better upkeep of work place and machineries				WI-EXTN-01	Y				
Hit by moving object	N			Body injury	2	3	6	2	LR	SG	EXT2-1.4.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-01	Y				

R2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

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Ritain Sengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0

wef:25.08.2022

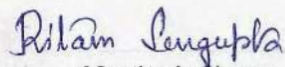
GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-EXTN-HIRA-2.0																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Flour generation											ACTIVITY No: 2.0								
SUB ACTIVITY												SUB ACTIVITY No:								
JOB TYPE	ROUTINE																			
INPUTS	Screened CPC , Machines , Electricity, Compressed Air																			
OUTPUT	CPC flour in bin																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-2.0.1	better upkeep of work place and machineries				WI-EXTN-02	Y			
Hit by moving object	N			Body injury	2	2	4	2	LR	SG	EXT2-2.0.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-02	Y			
Working in noise prone area	N			Interference in communication Temporary Deafness	1	5	5	2	LR	SG	EXT2-2.0.3	Better upkeep of work place and machineries				WI-EXTN-02	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

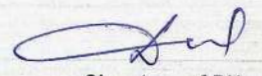
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0
wef:25.08.2022

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 02		No: GID-EXTN-HIRA-3.1																		
DATE : 10.11.2024																				
O IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Liquid pitch system											ACTIVITY No: 3.0								
SUB ACTIVITY	Unloading and storage of liquid pitch.											SUB ACTIVITY No: 3.1								
JOB TYPE	ROUTINE																			
INPUTS	Liquid pitch, Machinery																			
OUTPUT	Stored liquid pitch in tank.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SxO
							Management Programme	Work Instruction												
Inhalation of fumes	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-3.1.1	better upkeep of work place and machineries				WI-EXTN-04	Y			
Slipping from height	N			Body Injury	2	3	6	2	LR	SG	EXT2-3.1.2	safe place to work			OHSMP-EXT2-2	WI-EXTN-04	Y			
Fire		A		Burn	5	1	5	2	LR	SG	EXT2-3.1.3	safe place to work				WI-EXTN-04	Y			
Contact with hot material		A		Burn	4	1	4	2	LR	SG	EXT2-3.1.4	safe place to work				WI-EXTN-04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section in Charge

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Signature of DH

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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-3.2																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Liquid pitch system					ACTIVITY No: 3.0														
SUB ACTIVITY	Liquid pitch transfer and circulation					SUB ACTIVITY No: 3.2														
JOB TYPE	ROUTINE																			
INPUTS	Liquid pitch, Machinery																			
OUTPUT	Stored liquid pitch in day tank/ tank.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-3.2.1	better upkeep of work place and machineries				WI-EXTN-04	Y			
Slipping from height	N			Body injury	2	3	6	2	LR	SG	EXT2-3.2.2	safe place to work			OHSMP-EXT2-2	WI-EXTN-04	Y			
Fire		A		Burn	5	1	5	2	LR	SG	EXT2-3.2.3	safe place to work				WI-EXTN-04	Y			
Contact with hot material		A		Burn	4	1	4	2	LR	SG	EXT2-3.2.4	safe place to work				WI-EXTN-04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Pilam Sengupta
Signature of Section in Charge

[Signature]
Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0

wef:25.08.2022

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-4.1																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Green Scrap operation											ACTIVITY No: 4.0								
SUB ACTIVITY	Green Scrap crushing operation											SUB ACTIVITY No: 4.1								
JOB TYPE	ROUTINE																			
INPUTS	Green Scrap , Machinery																			
OUTPUT	Crushed green scrap in bin																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-4.1.1	better upkeep of work place and machineries				WI-EXTN-03	Y			
Hit by moving object	N			Body injury	2	3	6	2	LR	SG	EXT2-4.1.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-03	Y			
Working in noise prone area	N			Interference in communication Temporary Deafness	1	5	5	2	LR	SG	EXT2-4.1.3	better upkeep of work place and machineries				WI-EXTN-03	Y			

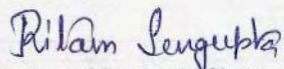
R2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

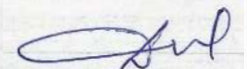
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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Signature of Rikam Sengupta

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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-4.2																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Green Scrap operation										ACTIVITY No: 4.0									
SUB ACTIVITY	Green Scrap Feeding operation										SUB ACTIVITY No: 4.2									
JOB TYPE	ROUTINE																			
INPUTS	Green Scrap , Machinery																			
OUTPUT	Crushed green scrap in bin																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-4.2.1	better upkeep of work place and machineries				WI-EXTN-03	Y			
Hit by moving object	N			Body injury	3	4	12	3	LR	SG	EXT2-4.2.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-03	Y			
Slipping from height	N			Body injury	2	3	6	2	LR	SG	EXT2-4.2.3	safe place to work			OHSMP-EXT2-2	WI-EXTN-03	Y			
Working in noise prone area	N			Interference in communication Temporary Deafness	1	5	5	2	LR	SG	EXT2-4.2.4	better upkeep of work place and machineries				WI-EXTN-03	Y			

R2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

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Ritain Sengupta
Signature of Section In Charge

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Signature of D11

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0
wef:25.08.2022

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-5.1																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Paste preparation			ACTIVITY No: 5.0																
SUB ACTIVITY	Weighing of particle			SUB ACTIVITY No: 5.1																
JOB TYPE	ROUTINE																			
INPUTS	CPC ,Liquid Pitch ,Green scrap, Additive, Extrusion oil, Machinery																			
OUTPUT	Charged material																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of Dust, Fumes	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-5.1.1	better upkeep of work place and machineries				WI-EXTN-05	Y			
Hit by falling object	N			Body injury	2	2	4	2	LR	SG	EXT2-5.1.2	safe place to work			GID-MR-FH-008 R0	WI-EXTN-05	Y			
Repetitive work	N			Cramp	1	5	5	2	LR	SG	EXT2-5.1.3									

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

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Ritam Sengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

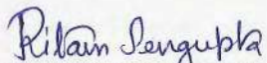
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DURGAPUR, WEST BENGAL				No: GID-EXTN-HIRA-5.2																		
REV NO : 02																						
DATE : 10.11.2024				IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT		Extrusion-2																				
ACTIVITY		Paste preparation		ACTIVITY No: 5.0																		
SUB ACTIVITY		Heating of particles		SUB ACTIVITY No: 5.2																		
JOB TYPE		ROUTINE																				
INPUTS		CPC , Machinery , Electricity																				
OUTPUT		Heated CPC																				
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE				
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO		
															Management Programme	Work Instruction						
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-5.2.1	better upkeep of work place and machineries				WI-EXTN-05	Y					
Hit by falling object	N			Body injury	2	2	4	2	LR	SG	EXT2-5.2.2	safe place to work				GID-MR-FH-006 R0	WI-EXTN-05	Y				
Electrocution	N			Trauma	3	2	6	2	LR	SG	EXT2-5.2.3	safe place to work					WI-EXTN-05	Y				
Fire	N			Burn	3	2	6	2	LR	SG	EXT2-5.2.4	safe place to work					WI-EXTN-05	Y				
Repetitive work	N			Cramp	1	5	5	2	LR	SG	EXT2-5.1.5											

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-5.3																		
REV NO : 02																				
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Extrusion-2																			
ACTIVITY	Paste preparation						ACTIVITY No: 5.0													
SUB ACTIVITY	Mixing operation and storage						SUB ACTIVITY No: 5.3													
JOB TYPE	ROUTINE																			
INPUTS	Weighed CPC , Liquid Pitch , Green scrap , Additive , Extrusion oil , Machinery																			
OUTPUT	Stored hot paste																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-5.3.1	better upkeep of work place and machineries				WI-EXTN-05	Y			
Hit by falling object	N			Body injury	2	2	4	2	LR	SG	EXT2-5.3.2	safe place to work			GID-MR-FH-006 R0	WI-EXTN-05	Y			
Electrocution	N			Trauma	3	2	6	2	LR	SG	EXT2-5.3.3	safe place to work				WI-EXTN-05	Y			
Repetitive work	N			Cramp	1	5	5	2	LR	SG	EXT2-5.3.4									

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section in Charge

[Signature]
Signature of D.I.

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 02		No: GID-EXTN-HIRA-5.4																		
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Extrusion-2																		
ACTIVITY		Paste preparation										ACTIVITY No: 5.0								
SUB ACTIVITY		System cleaning (mixer, table feeder, trema)										SUB ACTIVITY No: 5.4								
JOB TYPE		ROUTINE																		
INPUTS		Machinery , Tools and tackles , HDPE bags , Water , Compressed air																		
OUTPUT		Clean system																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
	Management Programme		Work Instruction																	
Inhalation of Dust	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-5.4.1	better upkeep of work place and machineries				WI-EXTN-08	Y			
Contact with skin	N			Body injury	3	2	6	2	LR	SG	EXT2-5.4.2	safe place to work				WI-EXTN-08	Y			
Hit by falling object	N			Body injury	2	2	4	2	LR	SG	EXT2-5.4.3	safe place to work			GID-MR-FH-006 R0	WI-EXTN-08	Y			
Slipping from height	N			Body injury	3	2	6	2	LR	SG	EXT2-5.4.4	safe place to work			OHSMP-EXT2-2	WI-EXTN-08	Y			
Working in confined space	N			Breathing problem	1	5	5	2	LR	SG	EXT2-5.4.5	NA				WI-EXTN-08	Y			
Contact with hot material.	N			Burn	2	3	6	2	LR	SG	EXT2-5.4.6	safe place to work				WI-EXTN-08	Y			
Awkward Posture	N			Cramp	1	5	5	2	LR	SG	EXT2-5.4.7	NA				WI-EXTN-08				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-EXTN-HIRA-6.1																
REV NO: 02																				
DATE: 10.11.2024				IDENTIFICATION & EVALUATION OF HAZARDS & RISK																
DEPARTMENT		Extrusion-2																		
ACTIVITY		Green stock extrusion																		
SUB ACTIVITY		Press Operation																		
JOB TYPE		ROUTINE																		
INPUTS		Hot paste, Machinery, Hydraulic oil																		
OUTPUT		Green electrode																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Inhalation of fumes	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-6.1.1	better upkeep of work place and machineries				WI-EXTN-06	Y			
Contact with skin	N			Body injury	3	2	6	2	LR	SG	EXT2-6.1.2	safe place to work				WI-EXTN-06	Y			
Hit by moving object	N			Body injury	2	2	4	2	LR	SG	EXT2-6.1.3	safe place to work			GID-MR-FH-006 R0	WI-EXTN-06	Y			
Slipping from height	N			Body injury	3	2	6	2	LR	SG	EXT2-6.1.4	safe place to work			OHSMP-EXT2-2	WI-EXTN-06	Y			
Contact with hot material.	N			Burn	2	3	6	2	LR	SG	EXT2-6.1.5	safe place to work				WI-EXTN-06	Y			
Awkward Posture	N			Cramp	1	5	5	2	LR	SG	EXT2-6.1.6	NA				WI-EXTN-06				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-6.2																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Green stock extrusion										ACTIVITY No: 6.0									
SUB ACTIVITY	Die change at New press										SUB ACTIVITY No: 6.2									
JOB TYPE	ROUTINE																			
INPUTS	Over head crane , tools and tackles																			
OUTPUT	Fixed desied die at New press																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Hit by moving object/Hit by falling object	N			Body injury	2	2	4	2	LR	SG	EXT2-6.2.1	safe place to work			GID-MR-FH-006 R0 OHSMP-EXT2-4	WI-EXTN-10	Y			
Slipping from height	N			Body injury	3	2	6	2	LR	SG	EXT2-6.2.2	safe place to work			OHSMP-EXT2-2	WI-EXTN-10	Y			
Awkward Posture	N			Cramp	1	5	5	2	LR	SG	EXT2-6.2.3	NA				WI-EXTN-10				

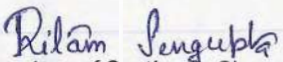
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Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-EXTN-HIRA-7.0																
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Extrusion-2																		
ACTIVITY		Thermopack operation										ACTIVITY No: 7.0								
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE																		
INPUTS		Thermic fluid , Machinery , CBM/Furnace Oil																		
OUTPUT		Hot thermic fluid																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of fumes	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-7.0.1	better upkeep of work place and machineries				WI-EXTN-11	Y			
Fire	N			Burn	3	2	6	2	LR	SG	EXT2-7.0.2	safe place to work				WI-EXTN-11	Y			
Caught in explosion	N			Trauma	3	2	6	2	LR	SG	EXT2-7.0.3	safe place to work				WI-EXTN-11	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sen Gupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-8.0																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Wet scrubber operation											ACTIVITY No: 8.0								
SUB ACTIVITY												SUB ACTIVITY No:								
JOB TYPE	ROUTINE																			
INPUTS	Fumes , Water , Machinery , Filter cloth																			
OUTPUT	Clean air																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
								Management Programme							Work Instruction					
Inhalation of fumes	N			Breathing Problem	1	5	5	2	LR	SG	EXT2-8.0.1	better upkeep of work place and machineries				WI-EXTN-12	Y			
Falling from height	N			Body injury	3	2	6	2	LR	SG	EXT2-8.0.2	safe place to work			OHSMP-EXT2-2	WI-EXTN-12	Y			
Working in noise prone area	N			Interference in communication	1	5	5	2	LR	SG	EXT2-8.0.3	safe place to work				WI-EXTN-12	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Rilam Lengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

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GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-EXTN-HIRA-9.0																
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Cooling pond operation										ACTIVITY No: 9.0									
SUB ACTIVITY											SUB ACTIVITY No:									
JOB TYPE	ROUTINE																			
INPUTS	Water , Machinery , Extruded hot green stock																			
OUTPUT	Cold green stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Pressing between two objects.	N			Body injury	2	3	6	2	LR	SG	EXT2-9.0.1	Reduction in loss of mandays due to accident.				WI-EXTN-07	Y			
Tripping on obstacle	N			Body injury	2	3	6	2	LR	SG	EXT2-9.0.2	Reduction in loss of mandays due to accident.				WI-EXTN-07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section In Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0
wef:25.08.2022

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-EXTN-HIRA-10.0																
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Extrusion-2																		
ACTIVITY		Stock stacking operation										ACTIVITY No: 10.0								
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE																		
INPUTS		Green stock , Wood , Machinery																		
OUTPUT		Stacked green stock																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by falling object			E	Body injury	5	1	5	2	LR	SG	EXT2-10.0.1	safe place to work			GID-MR-FH-006 R0	WI-EXTN-07	Y			
Slipping from height	N			Body injury	2	3	6	2	LR	SG	EXT2-10.0.2	safe place to work			OHSMP-EXT2-2	WI-EXTN-07	Y			
Pressing between two object	N			Body injury	3	4	12	3	LR	SG	EXT2-10.0.3	Reduction in loss of mandays due to accident.				WI-EXTN-07	Y			
Hit by moving object			E	Body injury	2	2	4	2	LR	SG	EXT2-10.0.4	safe place to work			GID-MR-FH006 R0 OHSMP-EXT2-6	WI-EXTN-07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section in Charge

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Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0

wef:25.08.2022

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-EXTN-HIRA-11.0																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Green stock shifting										ACTIVITY No: 11.0									
SUB ACTIVITY											SUB ACTIVITY No:									
JOB TYPE	ROUTINE																			
INPUTS	Green stock , Vehicle, Wood , Machinery																			
OUTPUT	Transferred green stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Hit by moving object	N			Body injury	2	2	4	2	LR	SG	EXT2-11.0.1	safe place to work			GID-MR-FH006 R0	WI-EXTN-07	Y			
Hit by falling object			E	Body injury	5	1	5	2	LR	SG	EXT2-11.0.2	safe place to work			OHSMP-EXT2-2	WI-EXTN-07	Y			
Pressing between two object	N			Body injury	2	3	6	2	LR	SG	EXT2-11.0.3	Reduction in loss of mandays due to accident.				WI-EXTN-07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

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Significant if Product P>=12 and LR/OR applicable

Ritam Sengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-EXTN-HIRA-12.0																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Extrusion-2																			
ACTIVITY	Effluent treatment plant operation										ACTIVITY No: 12.0									
SUB ACTIVITY	SUB ACTIVITY No.																			
JOB TYPE	ROUTINE																			
INPUTS	Contaminated water , Machinery , Chemical																			
OUTPUT	Clean water																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Contact with skin	N			Allergy	2	3	6	2	LR	SG	EXT2-12.0.1	safe place to work				GL-EXTN-08	Y			
Slipping from height	N			Body injury	2	3	6	2	LR	SG	EXT2-12.0.2	safe place to work			OHSMP-EXT2-2	GL-EXTN-08	Y			
Body contact	N			Skin allergy	2	3	6	2	LR	SG	EXT2-12.0.3	safe place to work				GL-EXTN-08	Y			
Snake/ insect bite	N			Cut injury Poisoning	3	2	6	2	LR	SG	EXT2-12.0.4	Reduction in loss of mandays due to accident.				GL-EXTN-08	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Pilam Sengupta
Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BTK-HIRA-1.1																
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Baking (Tunnel Kiln)																		
ACTIVITY		Loading of stock														ACTIVITY No: 1.0				
SUB ACTIVITY		Regular pre-loading check of kiln car														SUB ACTIVITY No: 1.1				
JOB TYPE		ROUTINE/NON ROUTINE : ROUTINE																		
INPUTS		Ceramic blanket, masonry tools, Machines																		
OUTPUT		Ready car for loading																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
															Management Programme	Work Instruction				
Contact with skin	X			skin irritation	1	3	3	1	-	NS	-	safe place to work	N	N	-		Y	-	-	-
Hit by moving object	X			Body injury	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

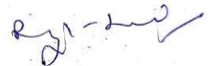
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0

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GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BTK-HIRA-1.2																		
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Loading of stock ACTIVITY No:1.0																			
SUB ACTIVITY	Preloading handling of stocks & loading in cars SUB ACTIVITY No:1.2																			
JOB TYPE	ROUTINE/NON ROUTINE: Routine																			
INPUTS	Stock,machine																			
OUTPUT	Loaded stock in car																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Pressing between two object	X			Body injury	3	1	3	1	LR	SG	BTK-1.2.1	safe place to work	N	N	-	WI-BAKTK-04 , WI-BAK-TK-09	Y	-	-	-
Hit by moving object	X			Body injury	2	1	2	1	-	NS	-	-	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-BTK-HIRA-2.0																
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Kiln car transport sequence															ACTIVITY No:2.0				
SUB ACTIVITY																SUB ACTIVITY No:				
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Loaded car,machine,oil,electricity																			
OUTPUT	Advancement of kiln car																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	X			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BTK-2.0.1	safe place to work	N	N	-	WI-BAKTK-05	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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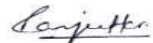
GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Furnace parameter monitoring and control											ACTIVITY No:3.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Fuel,air,machine,electricity																			
OUTPUT	Maintained furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire	X			Burn	2	1	2	1	LR	SG	BTK-3.0.1	safe place to work	N	N	-	GL-BAKTK-04	Y			
Inhalation of fumes/dust etc	X			Breathing Problem	1	5	5	2	-	NS	-	safe place to work	N	N	-	-	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection**Situation type:** N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable**CONTROLLED DOCUMENT**
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-BTK-HIRA-4.0																		
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Unloading stock handling & storage															ACTIVITY No: 4.0				
SUB ACTIVITY																SUB ACTIVITY No:				
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	Kiln car, machine, oil, electricity, wood																			
OUTPUT	Stacked stock, by product coke																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N) Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Contact with hot material	X			Burn	1	5	5	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Hit by moving object	X			Body injury	2	1	2	1	LR	SG	BTK-4.0.1	safe place to work	N	N	-	-	Y	-	-	-
Tripping on obstacle	X			Body injury	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection**Situation type:** N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Electrical panel operation													ACTIVITY No:5.0						
SUB ACTIVITY														SUB ACTIVITY No:						
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Electrical panel																			
OUTPUT	Distributed Power supply																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	X			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BTK-5.0.1	safe place to work	N	N	-	WI-BAKTK-02,05 , GL-BAKTK-02,03,04	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BTK-HIRA-6.0																		
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Main oil pump operation																ACTIVITY No:6.0			
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Machines(Pump),electricity																			
OUTPUT	Distribution of Furnace oil.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with skin	X			skin irritation	1	3	3	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BTK-HIRA-7.0																		
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Hydraulic oil operation																ACTIVITY No:7.0			
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Machines,electricity,hydraulic oil.																			
OUTPUT	Completed operation of machines																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with skin	X			skin irritation	1	3	3	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BTK-HIRA-8.0																		
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Shutdown maintenance of Tunnel kiln																ACTIVITY No:8.0			
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE: NON ROUTINE																			
INPUTS	Tools and tackles																			
OUTPUT	Furnace ready for operation																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Tripping on obstacle	X			Body injury	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (Tunnel Kiln)																			
ACTIVITY	Emergency shutdown of tunnel kiln													ACTIVITY No:9.0						
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE: NON ROUTINE																			
INPUTS	Shutdown in case of emergency																			
OUTPUT	Smoke emission																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of fumes/dust	X			Breathing Problem	1	5	5	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Fire	X			Burn	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024		No: GID-PI-HIRA-1.1																		
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Loading of PI basket in autoclave										ACTIVITY No: 1									
SUB ACTIVITY	Stock preparation for PI										SUB ACTIVITY No:1.1									
JOB TYPE	ROUTINE																			
INPUTS	Stock,machines,wood																			
OUTPUT	Stock ready for loading																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Pressing between two objects	x			Body injuru	4	1	4	1	LR	SG	BPI-1.1.1	safe place to work	N	N	-	WI-PI-01	Y			
Hit by falling object	x			Body injury	5	1	5	2	LR	SG	BPI-1.1.2	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Animesh Dhar
Signature of Section in Charge

[Signature]
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-1.2																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Loading of PI basket in autoclave										ACTIVITY No: 1									
SUB ACTIVITY	Loading the stock in PI basket										SUB ACTIVITY No:1.2									
JOB TYPE	ROUTINE																			
INPUTS	Stock,machines,tools and tackles																			
OUTPUT	Loaded stock in basket																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Pressing between two objects	x			Body injury	4	1	4	1	LR	SG	BPI-1.2.1	safe place to work	N	N	-	WI-PI-01	Y			
Hit by falling object	x			Body injury	5	1	5	2	LR	SG	BPI-1.2.2	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Animesh Dhar

Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-2.1																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Pitch Impregnation process											ACTIVITY No: 2								
SUB ACTIVITY	Preheating the stock using HGG											SUB ACTIVITY No:2.1								
JOB TYPE	ROUTINE																			
INPUTS	machine, fuel, water																			
OUTPUT	Preheated stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire/contact with hot material	x			Burn	5	1	5	2	LR	SG	BPI-2.1.1	safe place to work	N	N	-	WI-PI-02	Y			
Inhalation of fumes	x			Breathing problem	1	5	5	2	-	NS		safe place to work	N	N	-		Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Animesh Dhar

Signature of Section in Charge

Rajiv Dhar

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02		No:GID-PI-HIRA-2.2																		
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Pitch Impregnation process											ACTIVITY No: 2								
SUB ACTIVITY	Thermopac Operation											SUB ACTIVITY No:2.1								
JOB TYPE	ROUTINE																			
INPUTS	electricity,water,liquid/gaseous fuel.																			
OUTPUT	Hot thermic fluid																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire/contact with hot material	x			Burning	5	1	5	2	LR	SG	BPI-2.2.1	safe place to work	N	N	-	WI-PI-02	Y			
Inhalation of fumes	x			breathing problem	1	5	5	2	-	NS		safe place to work	N	N	-		Y			
Contact with skin	x			Burning	1	3	3	1	-	NS		safe place to work	N	N	-		Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Animesh Dhar
Signature of Section in Charge

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[Signature]
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Pitch Impregnation process										ACTIVITY No: 2									
SUB ACTIVITY	Pitch addition in pitch melting tank										SUB ACTIVITY No:2.3									
JOB TYPE	ROUTINE																			
INPUTS	Impregnating Pitch,machines,																			
OUTPUT	Molten pitch in PMT																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Inhalation of fumes	X			Breathing problem	1	5	5	2		NS		safe place to work	N	N	-		Y			
Contact with skin	X			Burning & skin allergy	5	1	5	2		NS		safe place to work	N	N	-		Y			
Hit by falling object	X			Body injury	5	1	5	2	LR	SG	BPI-2.3.1	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Animesh Dhar
Signature of Section in Charge

[Signature]
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: :GID-PI-HIRA-2.4																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Pitch Impregnation process											ACTIVITY No: 2								
SUB ACTIVITY	Vacuum and pressure cycle in autoclave											SUB ACTIVITY No:2.4								
JOB TYPE	ROUTINE																			
INPUTS	Machines,water,electricity,linseed oil																			
OUTPUT	Pitch Impregnated stock ready in autoclave																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-2.4.1	safe place to work	N	N	-	WI-PI-02	Y			
Inhalation of fumes	x			Breathing problem	1	5	5	2		NS		safe place to work	N	N	-		Y			
Contact with skin	x			Burning/skin allergy	1	5	5	2		NS		safe place to work	N	N	-		Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge

Rajiv Dhar
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No:GID-PI-HIRA-3.1																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Unloading the PI basket																			
SUB ACTIVITY	Transfer of PI basket from autoclave to cooling tank										ACTIVITY No: 3									
JOB TYPE	ROUTINE					SUB ACTIVITY No: 3.1														
INPUTS	Machines, cooling tank, water, electricity.																			
OUTPUT	Cooled PI stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of fumes	x			Breathing problem	1	5	5	2		NS		safe place to work	N	N	-		Y			
Body contact	x			Skin allergy	1	5	5	2		NS		safe place to work	N	N	-		Y			
Hit by falling object	x			Body injury	5	1	5	2	LR	SG	BPI-3.1.1	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-3.2																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Unloading the PI basket																			
SUB ACTIVITY	Unloading the stock from basket																			
JOB TYPE	ROUTINE																			
INPUTS	Machines,electricity,tools and tackles,wood																			
OUTPUT	Unloaded PI stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by falling object	x			Body injury	5	1	5	2	LR	SG	BPI-3.2.1	safe place to work	N	N	-	WI-PI-01	Y			
Pressing between two objects	x			Body injury	5	1	5	2	LR	SG	BPI-3.2.2	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-4.0																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Cleaning the Preheater, Basket, Chimney valve&Duct line,Main chimney blower											ACTIVITY No: 4.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Tools and tackles,machines																			
OUTPUT	Cleaned Preheater,Coke																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with hot material	X			Burn	4	1	4	1	LR	SG	BPI-4.0.1	safe place to work	N	N	-	GL-PI-01	Y			
Electrocution	X			Burn/Unconsciousness / Trauma	1	5	5	2	LR	SG	BPI-4.0.2	safe place to work	N	N	-	GL-PI-01	Y			
Slipping from height	X			Burn injury	4	1	4	1	LR	SG	BPI-4.0.3	safe place to work	N	N	-	GL-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Rajiv Dhar
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-5.0																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Dust collection systems											ACTIVITY No: 5								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Machines,electricity																			
OUTPUT	Dust free air,dust collector fines																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust	x			Breathing problem	1	5	5	2		NS		safe place to work	N	N	-		Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-6.0																	
DURGAPUR, WEST BENGAL																			
REV NO :02																			
DATE : 29.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Baking (PI)																		
ACTIVITY	Turning machine operation											ACTIVITY No: 6							
SUB ACTIVITY	SUB ACTIVITY No:																		
JOB TYPE	ROUTINE																		
INPUTS	Machines,electricity																		
OUTPUT	Turned stock,baked carbon chips																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	x			Breathing problem	1	5	5	2		NS		safe place to work	N	N	-		Y		
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-6.0.1	safe place to work	N	N	-	WI-PI-06	Y		
Hit by falling object	x			Body injury	3	1	3	1	LR	SG	BPI-6.0.2	safe place to work	N	N	-	WI-PI-06	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Rajesh

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-7.0																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Electrical panel operation										ACTIVITY No: 7.0									
SUB ACTIVITY											SUB ACTIVITY No:									
JOB TYPE	ROUTINE																			
INPUTS	Electrical panel																			
OUTPUT	Distributed Power supply																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-7.0.1	safe place to work	N	N	-	WI-PI-06, WI-PI-07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Main oil pump operation											ACTIVITY No: 8.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Machines(Pump),electricity																			
OUTPUT	Distribution of Furnace oil.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-8.0.1	safe place to work	N	N	-	WI-PI-03	Y			
																	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Rajesh

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-9.0																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Baking (PI)																		
ACTIVITY		Hydraulic oil operation												ACTIVITY No: 9.0						
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE																		
INPUTS		Machines,electricity,hydraulic oil.																		
OUTPUT		Completed operation of machines.																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire	x			Burn	5	1	5	2	LR	SG	BPI-9.0.1	safe place to work	N	N	-	GL-PI-04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Rajiv Dhar

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
No: GID-PI-HIRA-10.0																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Facing of nipples											ACTIVITY No: 10.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Machine,oil,electricity,stock																			
OUTPUT	Faced nipples.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Pressing between two objects	x			BODY INJURY	4	1	4	1	LR	SG	BPI-10.0.1	safe place to work	N	N	-	GL-PI-04	Y			
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-10.0.2	safe place to work	N	N	-	GL-PI-04	Y			
Inhalation of dust	x			Breathing problem	1	5	5	2		NS		safe place to work	N	N	-		Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Animesh Dhar

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-11.0																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Weighing scale operation																			
SUB ACTIVITY	ACTIVITY No: 11.0																			
JOB TYPE	ROUTINE																			
INPUTS	SUB ACTIVITY No:																			
OUTPUT	Stock,machines,tools and tackles																			
	Weight of stocks																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Pressing between two object	x			Body injury	4	1	4	1	LR	SG	BPI-11.0.1	safe place to work	N	N	-	WI-PI-01	Y			
Hit by falling object	x			Body injury	4	1	4	1	LR	SG	BPI-11.0.2	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
No: GID-PI-HIRA-12.0																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Water A.D Operation											ACTIVITY No: 12.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Stock,machines,tools and tackles																			
OUTPUT	Weight of stocks for A.D calculation																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Pressing between two object	x			Body injury	4	1	4	1	LR	SG	BPI-12.0.1	safe place to work	N	N	-	WI-PI-01	Y			
Hit by falling object	x			Body injury	4	1	4	1	LR	SG	BPI-12.0.2	safe place to work	N	N	-	WI-PI-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Animush Dhar

Signature of Section in Charge

Rajiv Dhar

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-13																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Stock parting Operation											ACTIVITY No: 13.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Stock,machines,electricity,water,tools and tackles																			
OUTPUT	Parted stocks in desired length.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-13.0.1	safe place to work	N	N	-	GL-PI-05	Y			
Pressing between two object	x			Body injury	5	1	5	2	LR	SG	BPI-13.0.2	safe place to work	N	N	-	GL-PI-05	Y			
Hit by falling object	x			Body injury	5	1	5	2	LR	SG	BPI-13.0.3	safe place to work	N	N	-	GL-PI-05	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Rajiv Dhar
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-PI-HIRA-14.0																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	IUT stock loading unloading											ACTIVITY No: 14.0								
SUB ACTIVITY												SUB ACTIVITY No:								
JOB TYPE	ROUTINE																			
INPUTS	Stock,machines(hydra,truck),tools and tackles																			
OUTPUT	Shifted stocks to section.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Pressing between two object	x			Body injury	5	1	5	2	LR	SG	BPI-14.0.1	safe place to work	N	N	-	GL-PI-06	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Animush Dhar
Signature of Section in Charge

Rajiv
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No:GID-PI-HIRA-15.0																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI)																			
ACTIVITY	Welding and cutting operation in PI											ACTIVITY No: 15.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Welding and cutting equipment																			
OUTPUT	Repaired portion																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	x			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BPI-15.0.1	safe place to work	N	N	-	GL-PI-07	Y			
Contact with hot material	x			Burn	5	1	4	2	LR	SG	BPI-15.0.2	safe place to work	N	N	-	GL-PI-07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No:GID-PI-HIRA-16.0																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Baking (PI)																		
ACTIVITY		Nitrogen Pressure System for PI												ACTIVITY No: 16.0						
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE																		
INPUTS		Equipment , Liquid Nitrogen																		
OUTPUT		Nitrogen with ambient temperature is a continuous supply to PI to maintain Autoclave pressure																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Caught in explosion	x			Burn/Body injury / Trauma	5	1	5	2	LR	SG	BPI-16.0.1	safe place to work	N	N	-	WI - PI - 02	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Animesh Dhar
Signature of Section in Charge

Rajiv
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: BPI4-HIRA-1.0																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Unloading and storage of liquid pitch											Activity No:1.0								
SUB ACTIVITY												SUB ACTIVITY No:								
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Liquid pitch,machines,heating system																			
OUTPUT	Stored Liquid pitch																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of fumes	X			Breathing problem	1	5	5	2	-	NS	-		N	N	N	N	Y			
Contact with skin	X			Allergy/Burn	1	1	1	1	-	NS	-		N	N	N	N	Y			
Contact with hot material	X			Burn	1	1	1	1	-	NS	-		N	N	N	N	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
No: BPI4-HIRA-2.0																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Thermopac Operation													ACTIVITY No: 2.0						
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Electricity,water,fuel,thermic fluid																			
OUTPUT	Hot thermic fluid																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with hot material	X			Burn	1	1	1	1	-	NS	-		N	N	N	N	Y			

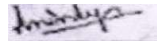
Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

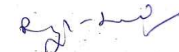
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Stock loading															ACTIVITY No: 3.0				
SUB ACTIVITY	Stock preparation															SUB ACTIVITY No: 3.1				
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Stock, Machines, Wood																			
OUTPUT	Stocks ready for loading																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by moving object	X			Body Injury	2	1	2	1	-	NS		Safe place to work	N	N	N	N	Y			
Pressing between two objects	X			Body Injury	4	1	4	1	LR	SG	BPI4-3.1.1	Safe place to work	N	N	N	WI-PI4-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

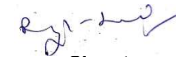
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
No: BPI4-HIRA-3.1																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Stock loading															ACTIVITY No: 3.0				
SUB ACTIVITY	Loading the stock															SUB ACTIVITY No: 3.2				
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Stock, Machines, tools and tackles																			
OUTPUT	Loaded stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by falling gobject object	X			Body Injury	2	1	2	1	-	NS		Safe place to work	N	N	N	N	Y			
Pressing between two objects	X			Body Injury	4	1	4	1	LR	SG	BPI4-3.2.1	Safe place to work	N	N	N	WI-PI4-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

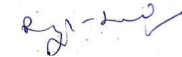
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: BPI4-HIRA-4.1										
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Baking(PI4)																		
ACTIVITY		Preheater Operation								ACTIVITY No: 4.0										
SUB ACTIVITY		Loading the stock in preheater								SUB ACTIVITY No: 4.1										
JOB TYPE		ROUTINE/NONROUTINE: Routine																		
INPUTS		Loaded stock, Machines, tools and tackles																		
OUTPUT		Loaded stock in preheater																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire	X			Burn	5	1	5	1	-	NS		Safe place to work	N	N	N	N	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

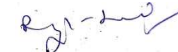
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: BPI4-HIRA-4.2																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Preheater Operation																	ACTIVITY No: 4.0		
SUB ACTIVITY	Preheating the stock inpreheater																	SUB ACTIVITY No: 4.2		
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Loaded stock, Machines, tools and tackles																			
OUTPUT	Preheated Stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire	X			Burn	5	1	5	1	-	NS		Safe place to work	N	N	N	N	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

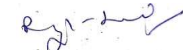
LR/OR= Legal and other requirement

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
No: BPI4-HIRA-5.1																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Autoclave Operation																ACTIVITY No: 5.0			
SUB ACTIVITY	Loading the stock in autoclave																SUB ACTIVITY No: 5.1			
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Stock from preheater, Machines, tools and tackles																			
OUTPUT	Stock in Autoclave																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with hot material	X			Burn	4	1	3	1	-	NS		Safe place to work	N	N	N	N	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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GID-MR-FH-002 R0

wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: BPI4-HIRA-5.2																	
REV NO :02																			
DATE : 29.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Baking(P14)																		
ACTIVITY	Autoclave Operation											ACTIVITY No: 5.0							
SUB ACTIVITY	Vacuum, pressure and cooling cycle in autoclave											SUB ACTIVITY No: 5.2							
JOB TYPE	ROUTINE/NONROUTINE: Routine																		
INPUTS	Stock from preheater, Machines, tools and tackles																		
OUTPUT	Stock in Autoclave																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of fumes	X			Breathing problem	1	1	1	1	-	NS			N	N	N	N	Y		
Contact with skin	X			Allergy	1	1	1	1	-	NS			N	N	N	N	Y		
Radiation hazard	X			Radiation related diseases	5	1	5	2	LR	SG		Safe place to work	N	N	N	WI-P14-09	Y		
Contact with hot material	X			Burn	4	1	3	1	-	NS		Safe place to work	N	N	N	N	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

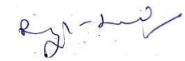
LR/OR= Legal and other requirement

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: BPI4-HIRA-5.3																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Autoclave Operation															ACTIVITY No: 5.0				
SUB ACTIVITY	Cooling in cooling tank															SUB ACTIVITY No: 5.3				
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS	Machines, water, stocks from autoclave																			
OUTPUT	Cooled stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with hot material	X			Burn	4	1	3	1	-	NS		Safe place to work	N	N	N	N	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

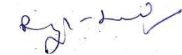
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 29.11.2024																				
No: BPI4-HIRA-6.0																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking(PI4)																			
ACTIVITY	Unloading and sampling of stock													Activity No:6.0						
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NONROUTINE: Routine																			
INPUTS																				
OUTPUT	Unloaded stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by moving object	X			Body Injury	4	1	4	1	-	NS	-		N	N	N	N	Y			
Passing between two objects	X			Body Injury	4	1	4	1	LR	SG	BPI4-6.01	Safe place to work	N	N	N	WI-PI4-02	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

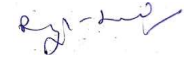
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: BPI4-HIRA-7.0																		
DURGAPUR, WEST BENGAL																				
REV NO :00																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (PI4)																			
ACTIVITY	Nitrogen Pressure System for PI4											ACTIVITY No: 7.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Equipment , Liquid Nitrogen																			
OUTPUT	Nitrogen with ambient temperature is a continuous supply to PI4 to maintain Autoclave pressure																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Caught in explosion	x			Burn/Body injury / Trauma	5	1	5	2	LR	SG	BPI-16.0.1	safe place to work	N	N	-	WI - PI4 - 02	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (RH)																			
ACTIVITY	Loading of stock												ACTIVITY No: 1							
SUB ACTIVITY	Regular pre-loading check of section												SUB ACTIVITY No:1.1							
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	mortar, ceramic blanket, masonry tools , Electricity																			
OUTPUT	Section ready for loading																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Electrocution	X			Burn/Unconsciousness / Trauma	1	1	1	2	LR	SG	BRH-1.1.1	safe place to work	N	N	-	WI-BAKRH-01	Y	-	-	-
Falling from height	X			Body injury	5	1	5	2	LR	SG	BRH-1.1.2	safe place to work	N	N	-	WI-BAKRH-01	Y	-	-	-
Inhalation of fumes/dust	X			Breathing Problem	1	2	2	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Contact with skin	X			Allergy	1	5	5	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Hot Surface Contact with skin	X			Skin Burn	1	1	1	2	-	NS	-	safe place to work	N	N	-	Temp monitoring register	Y	-	-	-

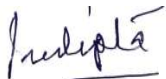
Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

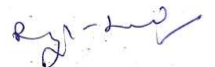
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

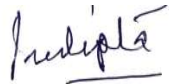
GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-1.2																			
DURGAPUR, WEST BENGAL																					
REV NO : 2																					
DATE : 29.11.2024																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT	Baking (RH)																				
ACTIVITY	Loading of stock												ACTIVITY No: 1								
SUB ACTIVITY	Bed preparation for stock loading												SUB ACTIVITY No:1.2								
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																				
INPUTS	CPC,machine,tools and tackles,electricity																				
OUTPUT	Section ready for loading																				
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan						RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO	
Electrocution	X			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BRH-1.2.1	safe place to work	N	N	-	WI-BAKRH-02	Y	-	-	-	
Falling from height	X			Body injury	5	1	5	2	LR	SG	BRH-1.2.2	safe place to work	N	N	-	WI-BAKRH-02	Y	-	-	-	
Inhalation of fumes/dust	X			Breathing Problem	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

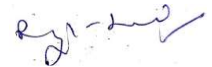
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

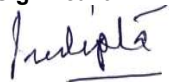
GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (RH)																			
ACTIVITY	Loading of stock											ACTIVITY No: 1								
SUB ACTIVITY	Preloading handling of stocks & loading in section											SUB ACTIVITY No:1.3								
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	Stock,wood,machine,sodium silicate, water,electricity																			
OUTPUT	Section loaded with stock.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Electrocution	X			Burn/Unconsciousness / Trauma	1	1	1	2	LR	SG	BRH-1.3.1	safe place to work	N	N	-	WI-BAKRH-02	Y	-	-	-
Pressing between two object	X			Body injury	3	1	3	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Falling from height	X			Body injury	5	1	5	2	LR	SG	BRH-1.3.2	safe place to work	N	N	-	WI-BAKRH-02	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

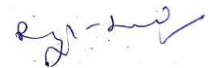
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-1.4																		
DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (RH)																			
ACTIVITY	Loading of stock												ACTIVITY No: 1							
SUB ACTIVITY	Covering of stock and change over												SUB ACTIVITY No:1.4							
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	CPC,machine,tools and tackles,electricity																			
OUTPUT	Stock Covered and section changed																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes/dust	X			Breathing Problem	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Pressing between two object	X			Body injury	3	1	3	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

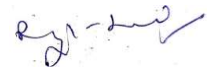
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-2.0																
DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (RH)																			
ACTIVITY	Furnace parameter monitoring and control													ACTIVITY No: 2						
SUB ACTIVITY														SUB ACTIVITY No:						
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	Fuel,air,machine,electricity																			
OUTPUT	Maintained furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of fumes	X			Breathing Problem	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Fire	X			Burn	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Contact with skin	X			Allergy	1	3	3	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

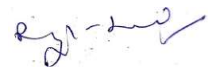
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

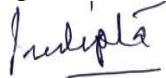
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DURGAPUR, WEST BENGAL																				
REV NO : 2		No: GID-BRH-HIRA-3.0																		
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Baking (RH)																		
ACTIVITY		CPC Removal and stock unloading												ACTIVITY No: 3						
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE/NON ROUTINE : ROUTINE																		
INPUTS		Air, machine, electricity, oil, wood																		
OUTPUT		Unloaded stock, CPC fines																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes/dust	X			Breathing Problem	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Working in noise prone area	X			Temporary deafness	1	3	3	2	LR	SG	BRH-3.0.1	safe place to work	N	N	-	WI-BAKRH-04	Y	-	-	-
Contact with hot material	X			Burn	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-4.0																			
DURGAPUR, WEST BENGAL																					
REV NO : 2																					
DATE : 29.11.2024																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT	Baking (RH)																				
ACTIVITY	Unloading stock cleaning, handling & storage												ACTIVITY No: 4								
SUB ACTIVITY	SUB ACTIVITY No:																				
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																				
INPUTS	Machine, electricity, wood.																				
OUTPUT	Storage of stocks in stock yard																				
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan						RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXC	
Inhalation of dust	X			Breathing Problem	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-	
Pressing between two object	X			Body injury	4	1	4	2	-	NS	BRH-4.0.1	safe place to work	N	N	-	WI-BAKRH-05	Y	-	-	-	
Contact with hot material	X			Burn	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

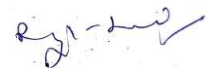
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-5.0																	
DURGAPUR, WEST BENGAL																					
REV NO : 2																					
DATE : 29.11.2024																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Baking (RH)																			
ACTIVITY		Screening of CPC												ACTIVITY No: 5							
SUB ACTIVITY		SUB ACTIVITY No:																			
JOB TYPE		ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS		Machine,electricity																			
OUTPUT		Screened CPC,CPC fines																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan						RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC	
Inhalation of dust	X			Breathing Problem	1	1	1	2	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

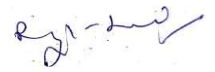
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-6.0																		
DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (RH)																			
ACTIVITY	Electrical panel operation												ACTIVITY No: 6							
SUB ACTIVITY													SUB ACTIVITY No:							
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	Electrical panel																			
OUTPUT	Distributed Power supply																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
Electrocution	X			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BRH-6.0.1	safe place to work	N	N	-	WI-BAKRH-03,04,06.07 , GL-BAKRH-05,06	Y	-	-	-
Fire	X			Burn	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

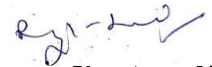
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

GID-MR-FH-002 R0

wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-7.0																
DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Baking (RH)																			
ACTIVITY	Main oil pump operation											ACTIVITY No: 7								
SUB ACTIVITY												SUB ACTIVITY No:								
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE																			
INPUTS	Machines(Pump),electricity																			
OUTPUT	Distribution of oil.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
															Management Programme	Work Instruction				
Contact with skin	X			skin irritation	1	3	3	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency


LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-8.0
DURGAPUR, WEST BENGAL	
REV NO : 2	
DATE : 29.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Baking (RH)	
ACTIVITY	Hydraulic oil operation	ACTIVITY No: 8
SUB ACTIVITY		SUB ACTIVITY No:
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE	
INPUTS	Machines,electricity,hydraulic oil.	
OUTPUT	Completed operation of machines.	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with skin	X			skin irritation	1	3	3	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

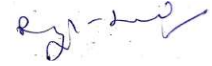
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-9.0
DURGAPUR, WEST BENGAL	
REV NO : 2	
DATE : 29.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Baking (RH)	
ACTIVITY	CBM Gas operation	ACTIVITY No: 9
SUB ACTIVITY		SUB ACTIVITY No:
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE	
INPUTS	Machines,electricity,CBM gas.	
OUTPUT	Firing completed with CBM.	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire	X			Burn	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

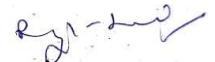
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

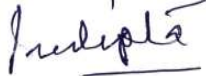
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DURGAPUR, WEST BENGAL																				
REV NO : 2																				
DATE : 29.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Baking (RH)																		
ACTIVITY		Grinding Operation												ACTIVITY No: 10						
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE/NON ROUTINE : ROUTINE																		
INPUTS		Machines,electricity,tools and tackles,grinding wheel																		
OUTPUT		Sharpening of tools or scrapper																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by moving object	X			Body injury	2	1	2	1	LR	SG	BRH-10.0.1	safe place to work	N	N	-	WI-BAKRH-05	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

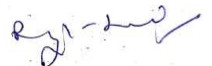
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-BRH-HIRA-11.0
DURGAPUR, WEST BENGAL	
REV NO : 2	
DATE : 29.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Baking (RH)
ACTIVITY	Pre-ramp fire for RH24 ACTIVITY No: 11
SUB ACTIVITY	SUB ACTIVITY No:
JOB TYPE	ROUTINE/NON ROUTINE : ROUTINE
INPUTS	Machines,electricity,CBM
OUTPUT	Optimised temperature control

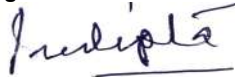
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Fire	X			Burn	2	1	2	1	-	NS	-	safe place to work	N	N	-	-	Y	-	-	-
Electrocution	X			Burn/Unconsciousness / Trauma	5	1	5	2	LR	SG	BRH-11.0.1	safe place to work	N	N	-	GL-BAKRH-03	Y	-	-	-

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

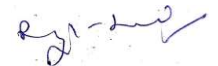
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0
wef:25.08.2022


GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: GID-GRA-HIRA-1.1																	
REV NO :02																			
DATE : 10.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Graphite(Acheson)																		
ACTIVITY	Preparation of Acheson Furnace											ACTIVITY No:1							
SUB ACTIVITY	Bringing of desire stocks											SUB ACTIVITY No:1.1							
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																		
INPUTS	Stocks																		
OUTPUT	Desire stocks for loading																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Hit by moving Object	N			Body Injury	3	1	3	1	LR	SG	GA-1.1.1	Safe place to work	N	N	N	WI-GRACH-03	Y		
Pressing between two object	N			Body Injury	5	1	5	2	LR	SG	GA-1.1.2	Safe place to work	N	N	N	WI-GRACH-03	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection


Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge

CONTROLLED DOCUMENT
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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRA-HIRA-1.2																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Preparation of Acheson Furnace											ACTIVITY No:1								
SUB ACTIVITY	Milling operation											SUB ACTIVITY No:1.2								
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	LAMC, Machine, Compressed Air																			
OUTPUT	Screened packed media																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of Dust	N			breathing problem	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-12	Y			
Slipping from height	N			Body injury	3	1	3	1	LR	SG	GA-1.2.1	Safe place to work	N	N	N	WI-GRACH-12	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

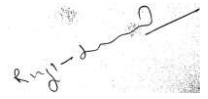
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRA-HIRA-1.3																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Preparation of Acheson Furnace															ACTIVITY No:1				
SUB ACTIVITY	Loading of furnace and necessary preparation for firing															SUB ACTIVITY No:1.3				
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Stock, pack media, new mix, renovate, wood , machine, concrete block																			
OUTPUT	Furnace ready for firing																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of Dust	N			breathing problem	1	2	2	1	LR	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-02/04	Y			
Hit by moving Object	N			Body Injury	3	1	3	1	LR	SG	GA-1.3.1	Safe place to work	N	N	N	WI-GRACH-02/04	Y			
Pressing between two object	N			Body Injury	5	1	5	2	LR	SG	GA-1.3.2	Safe place to work	N	N	N	WI-GRACH-02/04	Y			
Slipping from height	N			Body Injury	3	1	3	1	LR	SG	GA-1.3.3	Safe place to work	N	N	N	WI-GRACH-02/04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

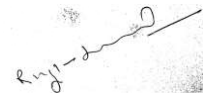
Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-GRA-HIRA-2.1																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Firing of Acheson furnace												ACTIVITY No:2							
SUB ACTIVITY	Starting of Rectoformer and furnace cooling system												SUB ACTIVITY No:2.1							
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Water, Electricity, Machine, Oil																			
OUTPUT	Smooth firing of furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	N			Burn	5	1	5	2	LR	SG	GA-2.1.1	better upkeep of work place and machineries	N	N	N	WI-GRACH-06	Y			
Working in noise prone area	N			Disrupt concentration	1	2	2	1	LR	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-06	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRA-HIRA-2.2																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Firing of Acheson furnace																ACTIVITY No:2			
SUB ACTIVITY	Firing of furnace																SUB ACTIVITY No:2.2			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Water, Electricity, Machine, Oil																			
OUTPUT	Fired furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXO
Inhalation of fumes	N			Breathing problem	1	2	2	1	LR	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-06/07	Y			
Fire	N			Burn	5	1	5	2	LR	SG	GA-2.2.1	Safe place to work	N	N	N	WI-GRACH-06/07, GL-GRACH-03	Y			
Electrocution	N			Burn	5	1	5	2	LR	SG	GA-2.2.2	better upkeep of work place and machineries	N	N	N	WI-GRACH-06/07	Y			
Caught in explosion	N			Burn	5	1	5	2	LR	SG	GA-2.2.3	better upkeep of work place and machineries	N	N	N	WI-GRACH-06/07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

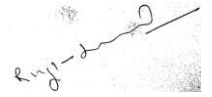
Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024				No: GID-GRA-HIRA-3.0																
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Cooling of Acheson furnace												ACTIVITY No:3.0							
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	water, electricity, Machine																			
OUTPUT	Cooled furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Hit by moving Object	N			Body Injury	3	1	3	1	LR	SG	GA-3.1	Safe place to work	N	N	N	WI-GRACH-08	Y			
Contact with hot material	N			Burn	3	1	3	1	LR	SG	GA-3.2	Safe place to work	N	N	N	WI-GRACH-08	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

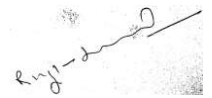
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-GRA-HIRA-4.1																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Unloading of Furnace																ACTIVITY No: 4.0			
SUB ACTIVITY	Unveling of Furnace																SUB ACTIVITY No:4.1			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Machine , Electricity																			
OUTPUT	unveiled furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	N			Breathing problem	1	2	2	1	LR	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-09	Y			
Hit by moving object	N			Body Injury	3	1	3	1	LR	SG	GA-4.1.1	Safe place to work	N	N	N	WI-GRACH-09	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Unloading of Furnace															ACTIVITY No : 4.0				
SUB ACTIVITY	Chunk and resistor clear															SUB ACTIVITY No:4.2				
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Machine , Electricity																			
OUTPUT	Furnace ready for unloading																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	N			Breathing problem	1	2	2	1	LR	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-09	Y			
Hit by moving object	N			Body Injury	3	1	3	1	LR	SG	GA-4.2.1	Safe place to work	N	N	N	WI-GRACH-09	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency


LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-GRA-HIRA-4.3																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Unloading of Furnace											ACTIVITY No: 4.0								
SUB ACTIVITY	Stock unloading cleaning and stacking											SUB ACTIVITY No:4.3								
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Machine, electricity, wood, tools and tackles																			
OUTPUT	stacked stocks																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with hot material	N			Burn	3	1	3	1	LR	SG	GA-4.3.1	Safe place to work	N	N	N	WI-GRACH-10	Y			
Hit by moving object	N			Body Injury	3	1	3	1	LR	SG	GA-4.3.2	Safe place to work	N	N	N	WI-GRACH-10	Y			
Pressing between two object	N			Body Injury	5	1	5	2	LR	SG	GA-4.3.3	Safe place to work	N	N	N	WI-GRACH-10	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection**Situation type:** N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicableCONTROLLED DOCUMENT
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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
No: GID-GRA-HIRA-5.0																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Dust collection operation											ACTIVITY No: 5.0								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Machine, electricity																			
OUTPUT	Dust free air, dust collector fines																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	N			Breathing problem	1	2	2	1	LR	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-12	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

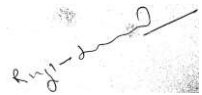
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

CONTROLLED DOCUMENT
(If this Stamp is in red)



Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02				No: GID-GRA-HIRA-6.0																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Renovate and New mix preparation														ACTIVITY No: 6.0					
SUB ACTIVITY															SUB ACTIVITY No:					
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Machine, electricity, silica sand, Saw dust, Breez coke and SIC chunk, Tools and tackles																			
OUTPUT	Prepared renovate and New mix																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	N			Breathing problem	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-13	Y			
Hit by moving object	N			Body Injury	3	1	3	1	LR	SG	GA-6.0.1	Safe place to work	N	N	N	WI-GRACH-13	Y			
Continuous carrying of weight	N			Sprain	1	1	1	1	LR	SG	GA-6.0.2	better upkeep of work place and machineries	N	N	N	WI-GRACH-13	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

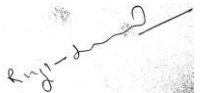
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024				No: GID-GRA-HIRA-7.0																
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Repairing of Furnace														ACTIVITY No:7.0					
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Refractory bricks, motor, refractory block, water, masonry tools, machine																			
OUTPUT	furnace ready for loading																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with skin	N			Allergy	1	1	1	1	LR	SG	GA-7.0.1	better upkeep of work place and machineries	N	N	N	WI-GRACH-11	Y			
Hit by falling Object	N			Body injury	5	1	5	2	LR	SG	GA-7.0.2	Safe place to work	N	N	N	WI-GRACH-11	Y			
Inhalation of dust	N			Allergic reaction	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-11	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

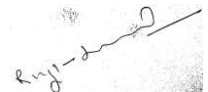
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Graphite(Acheson)																		
ACTIVITY		Dumping device operation in Acheson												ACTIVITY No:8.0						
SUB ACTIVITY		SUB ACTIVITY No:																		
JOB TYPE		ROUTINE/NON ROUTINE-ROUTINE																		
INPUTS		Manpower, Diesel																		
OUTPUT		Dumped Material																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust	N			Breathing problem	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-09/12	Y			
Hit by moving Object	N			Budy injury	3	1	3	1	LR	SG	GA-8.0.1	Safe place to work	N	N	N	WI-GRACH-09/12	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

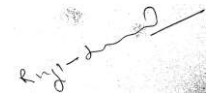
Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Silo Operation In Acheson												ACTIVITY No:9.0							
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	LAMC(Coke), filled HDPE bags, Manpower																			
OUTPUT	LAMC(Coke)																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	x			Breathing problem	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-09/12	Y			
Contact with Skin	x			Skin Allergy	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-09/12	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection**Situation type:** N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable**CONTROLLED DOCUMENT**
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRA-HIRA-10.0																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(Acheson)																			
ACTIVITY	Casting of Concrete blocks for Acheson furnace																ACTIVITY No:10.0			
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE-ROUTINE																			
INPUTS	Grog, Iron rod, Tools, Mixer machine, water, masonry																			
OUTPUT	Finished block																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Contact with Skin	N			Allergy	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-11	Y			
Hit by moving Object	N			Body injury	3	1	3	1	LR	SG	GA-10.0.1	Safe place to work	N	N	N	WI-GRACH-11	Y			
Inhalation of dust	N			Breathing problem	1	2	2	1	NA	NS	-	better upkeep of work place and machineries	N	N	N	WI-GRACH-11	Y			
Continuous carrying of weight	N			Sprain	1	1	1	1	LR	SG	GA-10.0.2	better upkeep of work place and machineries	N	N	N	WI-GRACH-11	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

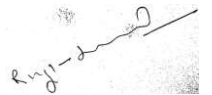
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :																				
DATE :																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT																				
ACTIVITY	ACTIVITY No:																			
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE/NON ROUTINE																			
INPUTS																				
OUTPUT																				
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
															Management Programme	Work Instruction				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection**Situation type:** N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: GID-GRL-HIRA-1.1																	
REV NO :02																			
DATE : 10.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Graphite(LWG#3)																		
ACTIVITY	Preparation of LWG#3 Furnace										ACTIVITY No:1								
SUB ACTIVITY	Bringing of desired stocks										SUB ACTIVITY No:1.1								
JOB TYPE	ROUTINE																		
INPUTS	Wood, Stock																		
OUTPUT	Desired stocks for loading																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Hit by moving object	x			Body injury	3	1	3	1	LR	SG	GL-1.1.1	Safe place to work	N	N	N	WI-GRLWG-03	Y		
Pressing between two object	x			Body injury	5	1	5	2	LR	SG	GL-1.1.2	Safe place to work	N	N	N	WI-GRLWG-03	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRL-HIRA-1.2																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(LWG#3)																			
ACTIVITY	Preparation of LWG#3 Furnace											ACTIVITY No:1								
SUB ACTIVITY	Loading of furnace and necessary preparation for firing											SUB ACTIVITY No:1.2								
JOB TYPE	ROUTINE																			
INPUTS	Stock, Pack media, Electricity, wood, machine, FGR, tools & tackles, gum																			
OUTPUT	Furnace ready for firing																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N)	Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	N			Breathing problem	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRL-02/03/04	Y			
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GL-1.2.1	Safe place to work	N	N	N	WI-GRL-02/03/04	Y			
Pressing between two object	N			Body injury	5	1	5	2	LR	SG	GL-1.2.2	Safe place to work	N	N	N	WI-GRL-02/03/04	Y			
Akward posture	N			Sprain/Cramp	2	1	2	1	LR	SG	GL-1.2.3	Safe place to work	N	N	N	WI-GRL-02/03/04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-GRL-HIRA-2.1																
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(LWG#3)																			
ACTIVITY	Firing of LWG#3 Furnace														ACTIVITY No: 2					
SUB ACTIVITY	Starting of Rectoformer and furnace cooling system														SUB ACTIVITY No:2.1					
JOB TYPE	ROUTINE																			
INPUTS	Water, Electricity, Machines,oil																			
OUTPUT	Smooth firing of Furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Electrocution	N			Burn	5	1	5	2	LR	SG	GL-2.1.1	Safe place to work	N	N	N	WI-GRL-06/07	Y			
Working in noise prone area	N			Disrupt concentration	1	2	2	1	LR	NS	-	Safe place to work	N	N	N	WI-GRL-06/07	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: GID-GRL-HIRA-2.2																	
REV NO :02																			
DATE : 10.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Graphite(LWG#3)																		
ACTIVITY	Firing of LWG#3 Furnace											ACTIVITY No:2							
SUB ACTIVITY	Firing of Furnace											SUB ACTIVITY No:2.2							
JOB TYPE	ROUTINE																		
INPUTS	Water, electricity, machine, oil																		
OUTPUT	Fired furnace																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXC
Electrocution	N			Burn	5	1	5	2	LR	SG	GL-2.1.2	Safe place to work	N	N	N	WI-GRL-06/07	Y		
Working in noise prone area	N			Disrupt concentration	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRL-06/07	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

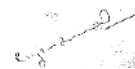
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DURGAPUR, WEST BENGAL																			
REV NO :02																			
DATE : 10.11.2024		No: GID-GRL-HIRA-3																	
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Graphite(LWG#3)																		
ACTIVITY	Cooling of LWG#3 Furnace											ACTIVITY No:3							
SUB ACTIVITY	SUB ACTIVITY No:																		
JOB TYPE	ROUTINE																		
INPUTS	Water, electricity,machine,oil																		
OUTPUT	Cooled furnace																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes	N			Breathing problem	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRL-08	Y		
Contact with hot materials	N			Burn	3	1	3	1	LR	SG	GL-3.0.2	Safe place to work	N	N	N	WI-GRL-08	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

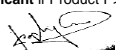
GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRL-HIRA-4																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(LWG#3)																			
ACTIVITY	Unloading of Furnace,Cleaning,Stacking											ACTIVITY No:4								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Machines,electricity,wood, tools & tackles																			
OUTPUT	Stacked stocks																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of dust	N			Breathing problem	1	2	2	1	LR	NS	-	Safe place to work	N	N	N	WI-GRL-09	Y			
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GL-4.0.1	Safe place to work	N	N	N	WI-GRL-09	Y			
Contact with hot materials	N			Burn	3	1	3	1	LR	SG	GL-4.0.2	Safe place to work	N	N	N	WI-GRL-09	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL																			
REV NO :02																			
DATE : 10.11.2024		No: GID-GRL-HIRA-5																	
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Graphite(LWG#3)																		
ACTIVITY	Repairing of furnace										ACTIVITY No:5								
SUB ACTIVITY	SUB ACTIVITY No:																		
JOB TYPE	ROUTINE																		
INPUTS	Castable ,refractory, block , water, machinery tools,machine																		
OUTPUT	Furnace ready for loading																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Falling from high	N			Body injury	3	1	3	1	LR	SG	GL-5.0.1	Safe place to work	N	N	N	WI-GRL-02	Y		
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GL-5.0.1	Safe place to work	N	N	N	WI-GRL-02	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

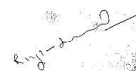
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DURGAPUR, WEST BENGAL		No: GID-GRL-HIRA-6																		
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(LWG#3)																			
ACTIVITY	Casting of concrete bolcks for LWG#3 Furnace											ACTIVITY No:6								
SUB ACTIVITY	SUB ACTIVITY No:																			
JOB TYPE	ROUTINE																			
INPUTS	Grog,iron rod,tools,mixer machine,water,masonry																			
OUTPUT	Finished blocks																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXC
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GL-6.0.1	Safe place to work	N	N	N	WI-GRL-10	Y			
Inhalation of dust	N			Breathing problem	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRL-10	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: GID-GRL-HIRA-7																	
REV NO :02																			
DATE : 10.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Graphite(LWG#3)																		
ACTIVITY	Operation of LAMC handling equipment (Goliath Crane)											ACTIVITY No:7							
SUB ACTIVITY	SUB ACTIVITY No:																		
JOB TYPE	ROUTINE																		
INPUTS	Machines,electricity,air,LAMB,electrical pannels																		
OUTPUT	Dust free air, dust collector fines, sized perticle																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of dust	N			Breathing problem	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRL-01	Y		
Working in noise prone area	N			Disrupt concentration	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRL-01	Y		
Falling from high	N			Body injury	3	1	3	1	LR	SG	GL-7.0.1	Safe place to work	N	N	N	WI-GRL-01	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection


Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO :02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite(LWG#3)												ACTIVITY No:8							
ACTIVITY	Goliath Crane bag filter cleaning												SUB ACTIVITY No:							
SUB ACTIVITY																				
JOB TYPE	ROUTINE																			
INPUTS	Compressed air,electricity																			
OUTPUT	Cleaned bag filters																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust	N			Breathing problem	1	2	2	1	LR	NS	-	Safe place to work	N	N	N	WI-GRL-01	Y			
Falling from high	N			Body injury	3	1	3	1	LR	SG	GL-8.0.1	Safe place to work	N	N	N	WI-GRL-01	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-GRL4/5-HIRA-1.1
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Graphite (LWG-4/5)	
ACTIVITY	Preparation of LWG-4/5 furnace	ACTIVITY NO.: 1
SUB ACTIVITY	Bringing of desired stock	SUB ACTIVITY No: 1.1
JOB TYPE	ROUTINE	
INPUTS	Stock	
OUTPUT	Desired stocks for loading	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/O R	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-1.1.1	safe place to work	N	N	N	WI-GRLWG-03	Y			
Pressing between two object	N			Body injury	3	1	3	1	LR	SG	GRL4/5.1.1.2	Reduction in loss of mandays due to accident.	N	N	N	WI-GRLWG-03	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-GRL4/5-HIRA-1.2																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Graphite (LWG-4/5)																			
ACTIVITY	Preparation of LWG-4/5 furnace											ACTIVITY NO.: 1								
SUB ACTIVITY	Loading of furnace and necessary preparation for firing											SUB. ACTIVITY NO. : 1.2								
JOB TYPE	ROUTINE																			
INPUTS	Stock,met coke,wood,machines,flexi graphite rings,tools and tackles,slingofer,hydraulic system																			
OUTPUT	Furnace ready for firing																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	N			Breathing Problem	1	2	2	1	NA	NS	-	safe place to work	N	N	N	WI-GRLWG-02/03/04	Y			
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-1.2.1	safe place to work	N	N	N	WI-GRLWG-02/03/04	Y			
Pressing between two object	N			Body injury	5	1	5	2	LR	SG	GRL4/5-1.2.2	safe place to work	N	N	N	WI-GRLWG-02/03/04	Y			
Awkward posture	N			Sprain / Cramp	2	1	2	1	LR	SG	GRL4/5-1.2.3	safe place to work	N	N	N	WI-GRLWG-02/03/04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																			
REV NO : 02 DATE : 10.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK										No: GID-GRL4/5-HIRA-2.1									
DEPARTMENT	Graphite (LWG-4/5)																		
ACTIVITY	Firing of LWG-4/5 furnace									ACTIVITY NO.: 2					ACTIVITY No:				
SUB ACTIVITY	Starting of rectoformer, furnace cooling & hydraulic system									SUB ACTIVITY No: 2.1									
JOB TYPE	ROUTINE																		
INPUTS	Water, Electricity, machines, oil, electrical panels																		
OUTPUT	Firing of furnace																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Electrocution	N			Burn	5	1	5	2	LR	SG	GRL4/5-2.1.1	safe place to work	N	N	N	WI-GRLWG-02/03/04	Y		
Working in noise prone area	N			Interference in communication Temporary Deafness	1	2	2	1	NA	NS	-	Better upkeep of work place and machinerries	N	N	N	WI-GRLWG-02/03/04	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-GRL4/5-HIRA-2.2								
DURGAPUR, WEST BENGAL																				
REV NO : 02 DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Graphite (LWG-4/5)																		
ACTIVITY		Firing of LWG-4/5 furnace										ACTIVITY NO.: 2				ACTIVITY No:				
SUB ACTIVITY		Firing of furnace										SUB ACTIVITY No: 2.2								
JOB TYPE		ROUTINE																		
INPUTS		Water, Electricity, machines, oil, electrical panels																		
OUTPUT		Fired furnace																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of Fumes	N			Breathing Problem	1	2	2	1	NA	NS	-	Safe place to work	N	N	N	WI-GRLWG-06	Y			
Fire	N			Burn	5	1	5	2	LR	SG	GRL4/5-2.2.1	Safe place to work	N	N	N	WI-GRLWG-06	Y			
Electrocution	N			Burn	5	1	5	2	LR	SG	GRL4/5.2.2.2	Safe place to work	N	N	N	WI-GRLWG-06	Y			
Working in noise prone area	N			Interference in communication Temporary Deafness	1	2	2	1	NA	NS	-	Better upkeep of work place and machineries	N	N	N	WI-GRLWG-06	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX														
DURGAPUR, WEST BENGAL																										
REV NO : 02 DATE : 10.11.2024																										
												No: GID-GRL4/5-HIRA-3														
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																										
DEPARTMENT			Graphite (LWG-4/5)																							
ACTIVITY			Cooling of LWG-4/5 furnace												ACTIVITY NO.: 3			ACTIVITY								
SUB ACTIVITY															SUB ACTIVITY No:											
JOB TYPE			ROUTINE																							
INPUTS			Water, Electricity, machines, oil, paper, electrical panels																							
OUTPUT			Cooled furnace																							
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE									
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO						
Inhalation of Fumes	N			Breathing Problem	1	2	2	1	NA	NS	-	safe place to work	N	N		WI-GRLWG-08	Y									
Contact with hot materials	N			Burn	3	1	3	1	LR	SG	GRL4/5-3.1	safe place to work	N	N		WI-GRLWG-08	Y									

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED													HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																						
REV NO : 02 DATE : 10.11.2024																						
													No: GID-GRL4/5-HIRA-4									
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																						
DEPARTMENT			Graphite (LWG-4/5)																			
ACTIVITY			Unloading of furnace, cleaning and stacking										ACTIVITY NO.: 4									
SUB ACTIVITY			SUB ACTIVITY No:																			
JOB TYPE			ROUTINE																			
INPUTS			Machine, electricity, tools and tackles																			
OUTPUT			Stacked stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE					
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO		
Inhalation of Dust	N			Breathing Problem	1	2	2	1	NA	NS	-	safe place to work	N	N	N	WI-GRLWG-09	Y					
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-4.1	safe place to work	N	N	N	WI-GRLWG-09	Y					
Falling from Hight	N			Body injury	3	1	3	1	LR	SG	GRL4/5-4.2	safe place to work	N	N	N	WI-GRLWG-09	Y					
Fire	N			Burn	5	1	5	2	LR	SG	GRL4/5-4.3	safe place to work	N	N	N	WI-GRLWG-09	Y					

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																					
REV NO : 02 DATE : 10.11.2024																					
												No: GID-GRL4/5-HIRA-5									
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Graphite (LWG-4/5)																			
ACTIVITY		Operation of Multipurpose crane (DEMCO)										ACTIVITY NO.: 5									
SUB ACTIVITY												SUB ACTIVITY No:									
JOB TYPE		ROUTINE																			
INPUTS		Machines, electricity, air, LAMC, electrical panels																			
OUTPUT		Dust free air, dust collector fines, sized particle																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE				
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO	
Inhalation of Dust	N			Breathing Problem	1	2	2	1	NA	NS	-	safe place to work	N	N	N	WI-GRLWG-01	Y				
Working in noise prone area	N			Interference in communication Temporary Deafness	1	2	2	1	LR	SG	GRL4/5-5.1	Better upkeep of work place and machineries	N	N	N	WI-GRLWG-01	Y				
Falling from Hight	N			Body injury	3	1	3	1	LR	SG	GRL4/5-5.2	safe place to work	N	N	N	WI-GRLWG-01	Y				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																					
REV NO : 02 DATE : 10.11.2024																					
												No: GID-GRL4/5-HIRA-6									
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Graphite (LWG-4/5)																			
ACTIVITY		Repairing of furnace										ACTIVITY NO.: 6					ACTIVITY No:				
SUB ACTIVITY		ROUTINE																			
JOB TYPE		ROUTINE																			
INPUTS		Castable, refractory block, water, masonry tools, machines																			
OUTPUT		Repaired Furnace																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE				
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO	
Falling from Height	N			Body injury	3	1	3	1	LR	SG	GRL4/5-6.1	safe place to work	N	N	N	WI-GRLWG-10	Y				
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-6.2	safe place to work	N	N	N	WI-GRLWG-10	Y				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED													HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																						
REV NO : 02 DATE : 10.11.2024																						
IDENTIFICATION & EVALUATION OF HAZARDS & RISK													No: GID-GRL4/5-HIRA-7									
DEPARTMENT: Graphite (LWG-4/5)													ACTIVITY NO.: 7									
ACTIVITY: Preparation of graphite head electrode and sleeve													SUB ACTIVITY No:									
SUB ACTIVITY: ROUTINE																						
JOB TYPE: Graphite head electrode, tools, machines																						
INPUTS: Machined graphite head electrode and sleeve																						
OUTPUT: Machined graphite head electrode and sleeve																						
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE					
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO		
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-7.1	safe place to work	N	N	N	WI-GRLWG-10	Y					
Pressing between two object	N			Body injury	5	1	5	2	LR	SG	GRL4/5-7.2	safe place to work	N	N	N	WI-GRLWG-10	Y					

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

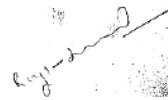
GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																					
REV NO : 02 DATE : 10.11.2024																					
												No: GID-GRL4/5-HIRA-8									
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Graphite (LWG-4/5)																			
ACTIVITY		Silo operation in LWG-4/5										ACTIVITY NO.: 8				ACTIVITY No:					
SUB ACTIVITY												SUB ACTIVITY No:									
JOB TYPE		ROUTINE																			
INPUTS		LAMC(coke) filled HDPE bags.																			
OUTPUT		LAMC(coke)																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE				
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO	
Inhalation of Dust	N			Breathing Problem	1	2	2	1	NA	NS	-	safe place to work	N	N	N	WI-GRLWG-02	Y				
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-8.1	safe place to work	N	N	N	WI-GRLWG-02	Y				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																					
REV NO : 02 DATE : 10.11.2024																					
												No: GID-GRL4/5-HIRA-9									
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Graphite (LWG-4/5)																			
ACTIVITY		Casting of concrete blocks for LWG#4/5 furnace										ACTIVITY NO.: 9					ACTIVITY No:				
SUB ACTIVITY																					
JOB TYPE		ROUTINE																			
INPUTS		Whythead-k, firecrete, iron rod, tools, mixer machine, water, masonary																			
OUTPUT		Finished concrete blocks																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE				
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO	
Falling from Hight	N			Body injury	3	1	3	1	LR	SG	GRL4/5-9.1	safe place to work	N	N	N	WI-GRLWG-10	Y				
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-9.2	safe place to work	N	N	N	WI-GRLWG-10	Y				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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Pratam Aich
Signature of Section in Charge

[Signature]
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED												HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																					
REV NO : 02 DATE : 10.11.2024																					
												No: GID-GRL4/5-HIRA-10									
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Graphite (LWG-4/5)																			
ACTIVITY		Demco bag-filter cleaning										ACTIVITY NO.: 10					ACTIVITY No:				
SUB ACTIVITY																					
JOB TYPE		ROUTINE																			
INPUTS		Compressed air																			
OUTPUT		Cleaned bag filters																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE				
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO	
Inhalation of Dust	N			Breathing Problem	1	2	2	1	NA	NS	-	safe place to work	N	N	N	WI-GRLWG-01	Y				
Falling from Hight	N			Body injury	3	1	3	1	LR	SG	GRL4/5-10.1	safe place to work	N	N	N	WI-GRLWG-01	Y				

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED													HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX									
DURGAPUR, WEST BENGAL																						
REV NO : 02 DATE : 10.11.2024																						
IDENTIFICATION & EVALUATION OF HAZARDS & RISK													No: GID-GRL4/5-HIRA-11									
DEPARTMENT	Graphite (LWG-4/5)																					
ACTIVITY	IUT STOCKS LOADING & UNLOADIN												ACTIVITY NO.: 7									
SUB ACTIVITY													SUB ACTIVITY No:									
JOB TYPE	ROUTINE																					
INPUTS	Stock, machines, wood, tools and tackles																					
OUTPUT	Stocks ready for despatch or stacked unloaded stocks																					
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/N S	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE					
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO		
Hit by moving object	N			Body injury	3	1	3	1	LR	SG	GRL4/5-11.1	safe place to work	N	N	N	WI-GRLWG-01	Y					
Pressing between two object	N			Body injury	5	1	5	2	LR	SG	GRL4/5-11.2	safe place to work	N	N	N	WI-GRLWG-01	Y					
Falling from Hight	N			Body injury	3	1	3	1	LR	SG	GRL4/5-11.3	safe place to work	N	N	N	WI-GRLWG-01	Y					

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

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Signature of Section in Charge



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0
wef:25.08.2022

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																								
DURGAPUR, WEST BENGAL																										
REV NO :		No: XXX																								
DATE :																										
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																										
DEPARTMENT																										
ACTIVITY	ACTIVITY No:																									
SUB ACTIVITY	SUB ACTIVITY No:																									
JOB TYPE	ROUTINE/NON ROUTINE																									
INPUTS																										
OUTPUT																										
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE									
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO						

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

Signature of Section in Charge

Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-1.1																		
REV NO : 02																				
DATE : 30.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Finishing																			
ACTIVITY	Nipple Machining	ACTIVITY No:1																		
SUB ACTIVITY	Band saw cutting of Nipple blank	SUB ACTIVITY No:1.1																		
JOB TYPE	ROUTINE																			
INPUTS	Nipple cutting machine(band saw)																			
OUTPUT	Parted Nipple																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.1.1		N	N	-	WI-FIN-03,WI-FIN-14	Y	2	1	2
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.1.2		N	N	-	WI-FIN-03,WI-FIN-14	Y	2	1	2
		A		cut injury	3	2	6	1	LR	SG	GID-FIN-HIRA-1.1.3		N	N	-	WI-FIN-03,WI-FIN-14	Y			
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

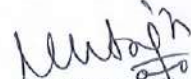
LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-1.2																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Nipple Machining																			
SUB ACTIVITY	Taper turning of Nipple blank																			
JOB TYPE	ROUTINE																			
INPUTS	Parted blank, machine, insert																			
OUTPUT	Tapered blank																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.2.1		N	N	-	WI-FIN-04, WI-FIN-15	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

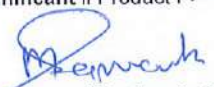
GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																			
DURGAPUR, WEST BENGAL																													
REV NO :02																				No: GID-FIN-HIRA-1.3									
DATE : 30.11.2024																													
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																													
DEPARTMENT		Finishing																											
ACTIVITY		Nipple Machining																											
SUB ACTIVITY		Threading of Nipple																											
JOB TYPE		ROUTINE																											
INPUTS		Tapered blanks, machine, cutting tools																											
OUTPUT		Threaded nipple																											
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE											
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO									
															Management Programme	Work Instruction													
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2									
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4									
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.3.1		N	N	-	-	Y	2	1	2									
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2									

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge


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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-FIN-HIRA-1.4
DURGAPUR, WEST BENGAL	
REV NO :02	
DATE : 30.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Finishing
ACTIVITY	Nipple Machining ACTIVITY No:1
SUB ACTIVITY	Drilling and notching of Nipples SUB ACTIVITY No:1.4
JOB TYPE	ROUTINE
INPUTS	Threaded nipple, machine, cutting tools
OUTPUT	Drilled and notched nipple

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.4.1		N	N	-	WI-FIN-05,WI-FIN-15	Y	2	1	2
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.4.2		N	N	-	WI-FIN-05,WI-FIN-15	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

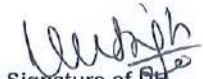
Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-1.5																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Nipple Machining																			
SUB ACTIVITY	Pitch stick inserting																			
JOB TYPE	ROUTINE																			
INPUTS	Drilled and notched nipple, pitch stick, adhesive																			
OUTPUT	Finished nipple																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N		-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N		-	Y	2	2	4
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.5.1		N	N		WI-FIN-06	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N		-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

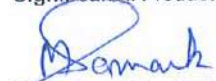
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DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-1.6																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Ok/salvage nipple stacking											ACTIVITY No:1								
SUB ACTIVITY												SUB ACTIVITY No:0								
JOB TYPE	ROUTINE																			
INPUTS	Drilled and notched nipple																			
OUTPUT	Stacked nipple																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.6.1		N	N	-	WI-FIN-10	Y	2	1	2
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-1.6.2		N	N	-	WI-FIN-10	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-2.1																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Electrode Machining																			
SUB ACTIVITY	Electrode socketing																			
JOB TYPE	ROUTINE																			
INPUTS	Electrode, machines, cutting tools																			
OUTPUT	Socketed electrodes																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-2.1.1		N	N	-	WI-FIN-10,WI-FIN-14,	Y	2	1	2
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-2.1.2		N	N	-	WI-FIN-10,WI-FIN-14,	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

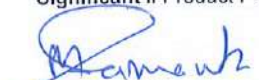
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DURGAPUR, WEST BENGAL	
REV NO :02	
DATE : 30.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Finishing	ACTIVITY No:2
ACTIVITY	Electrode Machining	
SUB ACTIVITY	Electrode outer Dia turning and centering	SUB ACTIVITY No:2.1
JOB TYPE	ROUTINE	
INPUTS	Socketed electrode, machines, cutting tools	
OUTPUT	Centred, turned and socketed electrodes	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS		N	N	-	-	Y	1	2	2	
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS		N	N	-	-	Y	2	2	4	
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-2.2.1	N	N	-	WI-FIN-10,WI-FIN-14	Y	2	1	2	
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-2.2.2	N	N	-	WI-FIN-10,WI-FIN-14	Y	2	1	2	
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS		N	N	-	-	Y	2	1	2	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge



Signature of DH

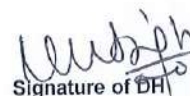
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX											
DURGAPUR, WEST BENGAL																					
REV NO :02										No: GID-FIN-HIRA-2.3											
DATE : 30.11.2024																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Finishing																			
ACTIVITY		Electrode Machining																			
SUB ACTIVITY		Band marking on Electrode																			
JOB TYPE		ROUTINE																			
INPUTS		Turned and socketed electrodes, aluminium paint, brush																			
OUTPUT		Finished electrode																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC	
															Management Programme	Work Instruction					
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	Y	Y	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	Y	Y	Y	2	2	4
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-2.3.1		N	N	-		WI-FIN-02, WI-FIN-14	Y	2	1	2
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-2.3.2		N	N	-		WI-FIN-02, WI-FIN-14	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	Y	Y	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

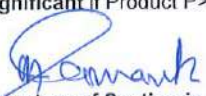

 Signature of DH

CONTROLLED DOCUMENT
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX										
DURGAPUR, WEST BENGAL																				
REV NO :02										No: GID-FIN-HIRA-3.0										
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Finishing																		
ACTIVITY		Punch marking on stocks																		
SUB ACTIVITY		ACTIVITY No:3.0 SUB ACTIVITY No:3.0																		
JOB TYPE		ROUTINE																		
INPUTS		Finished electrode/nipple,punch,tools and tackles																		
OUTPUT		Marked electrode/nipple																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS		N	N	-	-	Y	1	2	2	
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS		N	N	-	-	Y	2	2	4	
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-3.0,1	N	N	-	WI-FIN-02,WI-FIN-14	Y	2	1	2	
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS		N	N	-	-	Y	2	1	2	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

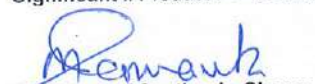

 Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX											
DURGAPUR, WEST BENGAL																					
REV NO :02										No: GID-FIN-HIRA-4.0											
DATE : 30.11.2024																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT		Finishing																			
ACTIVITY		Pre fitting of nipple																			
SUB ACTIVITY																					
JOB TYPE		ROUTINE																			
INPUTS		Ok electrode, Ok nipple, tools and tackles																			
OUTPUT		Prefitted electrode																			
HAZARDS/CONCERN		SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
		N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of dust etc		N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin		N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object		N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-4.0.1		N	N	-	WI-FIN-07	Y	2	1	2
Pressing between two object		N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-4.0.2		N	N	-	WI-FIN-07	Y	2	1	2
Forceful movement		N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

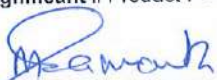

 Signature of DH

CONTROLLED DOCUMENT
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-5.0																		
REV NO :02																				
DATE : 30.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Finishing																ACTIVITY No:5.0			
ACTIVITY	Salvage Electrode handling																SUB ACTIVITY No:0			
SUB ACTIVITY																				
JOB TYPE	ROUTINE																			
INPUTS	Salvage Electrode, Crane, Fork truck																			
OUTPUT	Stacked salvaged stock																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-5.0.1		N	N	-	WI-FIN-02, WI-FIN-14	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-		Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge


 Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-FIN-HIRA-6.0
DURGAPUR, WEST BENGAL	
REV NO :02	
DATE : 30.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	Finishing		
ACTIVITY	Hoist operation for loading & unloading stocks	ACTIVITY No:6.0	
SUB ACTIVITY		SUB ACTIVITY No:0	
JOB TYPE	ROUTINE		
INPUTS	Electrode/nipple stocks		
OUTPUT	Electrode/nipple stocks		

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
															Management Programme						Work Instruction
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-6.0.1		N	N	-	WI-FIN-01,WI-FIN-03,WI-FIN-04,WI-FIN-05,WI-FIN-02,WI-FIN-14,WI-FIN-15,	Y	2	1	2
Electrocution	N			Trauma/Unconsciousness /Burn	2	1	2	1	LR	SG	GID-FIN-HIRA-6.0.2		N	N	-	WI-FIN-01,WI-FIN-03,WI-FIN-04,WI-FIN-05,WI-FIN-02,WI-FIN-14,WI-FIN-15,	Y	2	1	2
Pressing between two object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-6.0.3		N	N	-	WI-FIN-01,WI-FIN-03,WI-FIN-04,WI-FIN-05,WI-FIN-02,WI-FIN-14,WI-FIN-15,	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge


 Signature of DFF

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-7.0																		
REV NO :02																				
DATE : 30.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Finishing																ACTIVITY No:7.0			
ACTIVITY	Dust collection systems																SUB ACTIVITY No:0			
SUB ACTIVITY																				
JOB TYPE	ROUTINE																			
INPUTS	Machines, electricity																			
OUTPUT	Dust free air, dust collector fines																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1		NS			N	N	-	-	Y	2	2	4
Electrocution	N			Trauma/Unconsciousness /Burn	2	1	2	1	LR	SG	GID-FIN-HIRA-7.0.1		N	N	-	WI-FIN-16	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

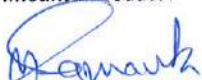

 Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX										
DURGAPUR, WEST BENGAL																				
REV NO :02										No: GID-FIN-HIRA-8.0										
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Finishing																		
ACTIVITY		Collection of Spilled hydraulic oil from machine																		
SUB ACTIVITY		ACTIVITY No:8.0 SUB ACTIVITY No:0																		
JOB TYPE		ROUTINE																		
INPUTS		cotton waste																		
OUTPUT		Oil soaked cotton waste																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS		N	N	-	-	Y	1	2	2	
Slipping	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-8.0.1	N	N	-	WI-FIN-10,WI-FIN-14,	Y	2	1	2	
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS		N	N	-	-	Y	2	2	4	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge


 Signature of HSE

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-9.0																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Electrical panel operation																			
SUB ACTIVITY	ACTIVITY No:9.0																			
JOB TYPE	ROUTINE																			
INPUTS	Electrical pannel																			
OUTPUT	Distributed Power supply																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Electrocution	N			Trauma	2	1	2	1	LR	SG	GID-FIN-HIRA-9.0.1		N	N	-	WI-FIN-016	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section In Charge


Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

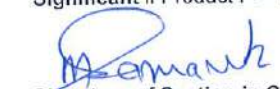
GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX										
DURGAPUR, WEST BENGAL										No: GID-FIN-HIRA-10.0										
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Finishing										ACTIVITY No:10.0								
ACTIVITY		Floor sweeping operation										SUB ACTIVITY No:0								
SUB ACTIVITY																				
JOB TYPE		ROUTINE																		
INPUTS		Brush,Shovel,Bags																		
OUTPUT		Clean floor																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS		N	N	-	-	Y	1	2	2	
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS		N	N	-	-	Y	2	2	4	

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge


Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-11.0																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Shifting of graphite fines from shop floor to outside packing area												ACTIVITY No:11.0							
SUB ACTIVITY													SUB ACTIVITY No:0							
JOB TYPE	ROUTINE																			
INPUTS	Shovel, hand trolley, bags																			
OUTPUT	shifted graphite fines																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS		N	N	-	-	Y	1	2	2	
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS		N	N	-	-	Y	2	2	4	
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS		N	N	-	-	Y	2	1	2	

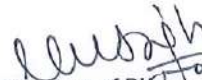
Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge

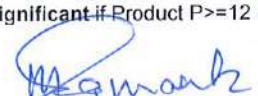

Signature of DH

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-FIN-HIRA-12.0																		
REV NO :02																				
DATE : 30.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Finishing																			
ACTIVITY	Resharpener of cutting tools																			
SUB ACTIVITY	ACTIVITY No:12.0 SUB ACTIVITY No:0																			
JOB TYPE	ROUTINE																			
INPUTS	Hobs, Chasers, Boring, Facing, Side taper & Turning tool grinding m/c etc.																			
OUTPUT	Resharpener tools																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of dust etc	N			Breathing Problem/Allergic reaction	1	2	2	1	-	NS			N	N	-	-	Y	1	2	2
Contact with skin	N			skin irritation/eye irritation	2	2	4	1	-	NS			N	N	-	-	Y	2	2	4
Hit by moving object	N			Body injury	2	1	2	1	LR	SG	GID-FIN-HIRA-12.0.1		N	N	-	WI-FIN-11	Y	2	1	2
Forceful movement	N			Sprain/cramp	2	1	2	1	-	NS			N	N	-	-	Y	2	1	2

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge


 Signature of BH

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PROCESS DEPARTMENT

HAZARD IDENTIFICATION

AND

RISK ASSESSMENT MATRIX



GRAPHITE INDIA LIMITED
(Graphite Electrode Division, Durgapur)

Sagarbhangra, Durgapur – 713211
West Bengal, India

E-mail: general_dgp@graphiteindia.com
Web : www.graphiteindia.com

ACTIVITYWISE HAZARD IDENTIFICATION

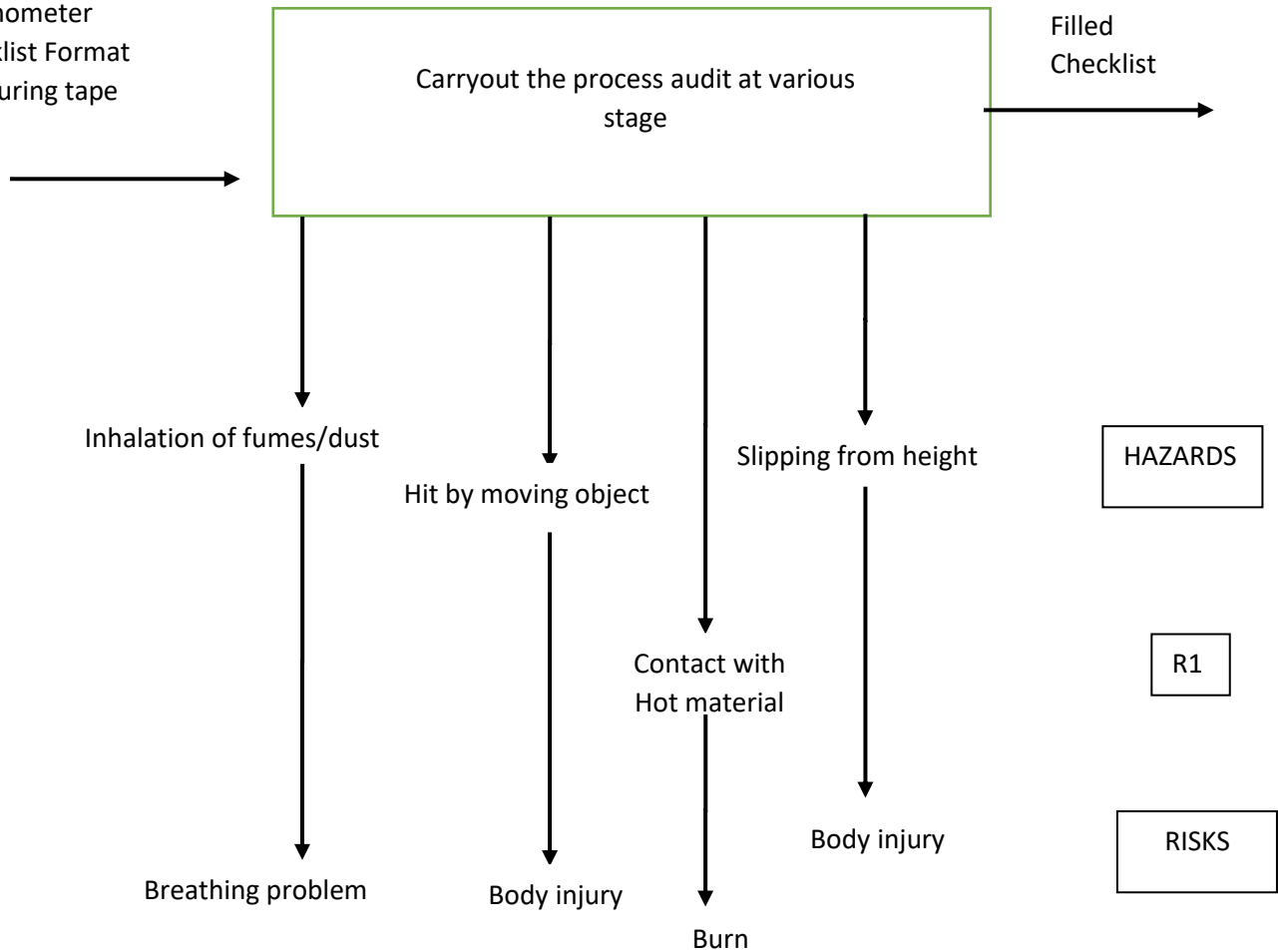
Department: Technical

Section: Process

Area: EXT,BAK,PI,GRA

Date: 18.11.24

Manpower
Digital/Mercury
thermometer
Checklist Format
Measuring tape



Person carrying out hazard identification: Name:

Sign

Worker participated/consulted:

Name:

Sign

Endorsement by DH:

Name:

Sign

CONTROLLED DOCUMENT
(If this Stamp is in red)

ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

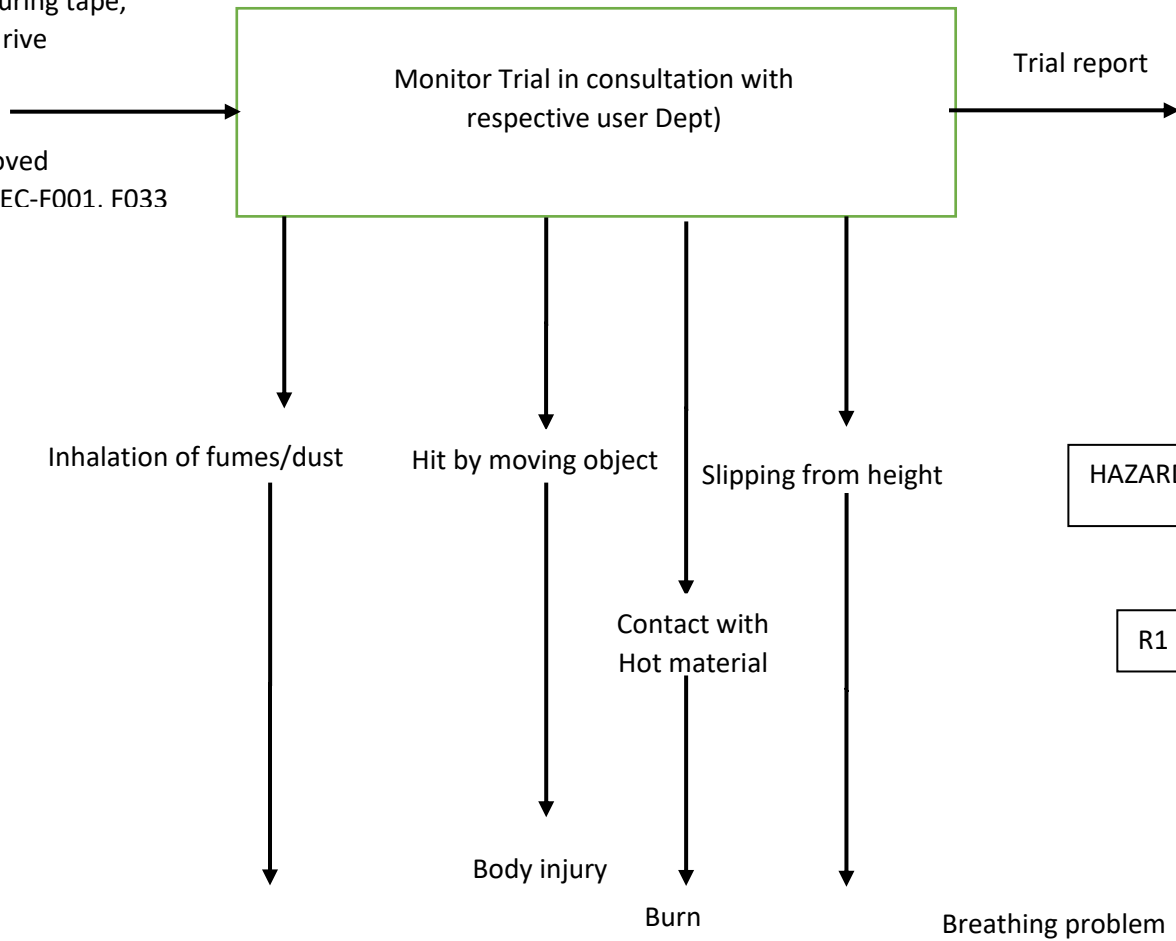
Section: Process

Area: EXT,BAK,PI,GRA

Date: 18.11.24

Manpower
Digital/Mercury
thermometer
Measuring tape,
USB drive

Approved
GID-TEC-F001. F033



Person carrying out hazard identification: Name:

Sign

Worker participated/consulted:

Name:

Sign

Endorsement by DH:

Name:

Sign

CONTROLLED DOCUMENT
(If this Stamp is in red)

ACTIVITYWISE HAZARD IDENTIFICATION

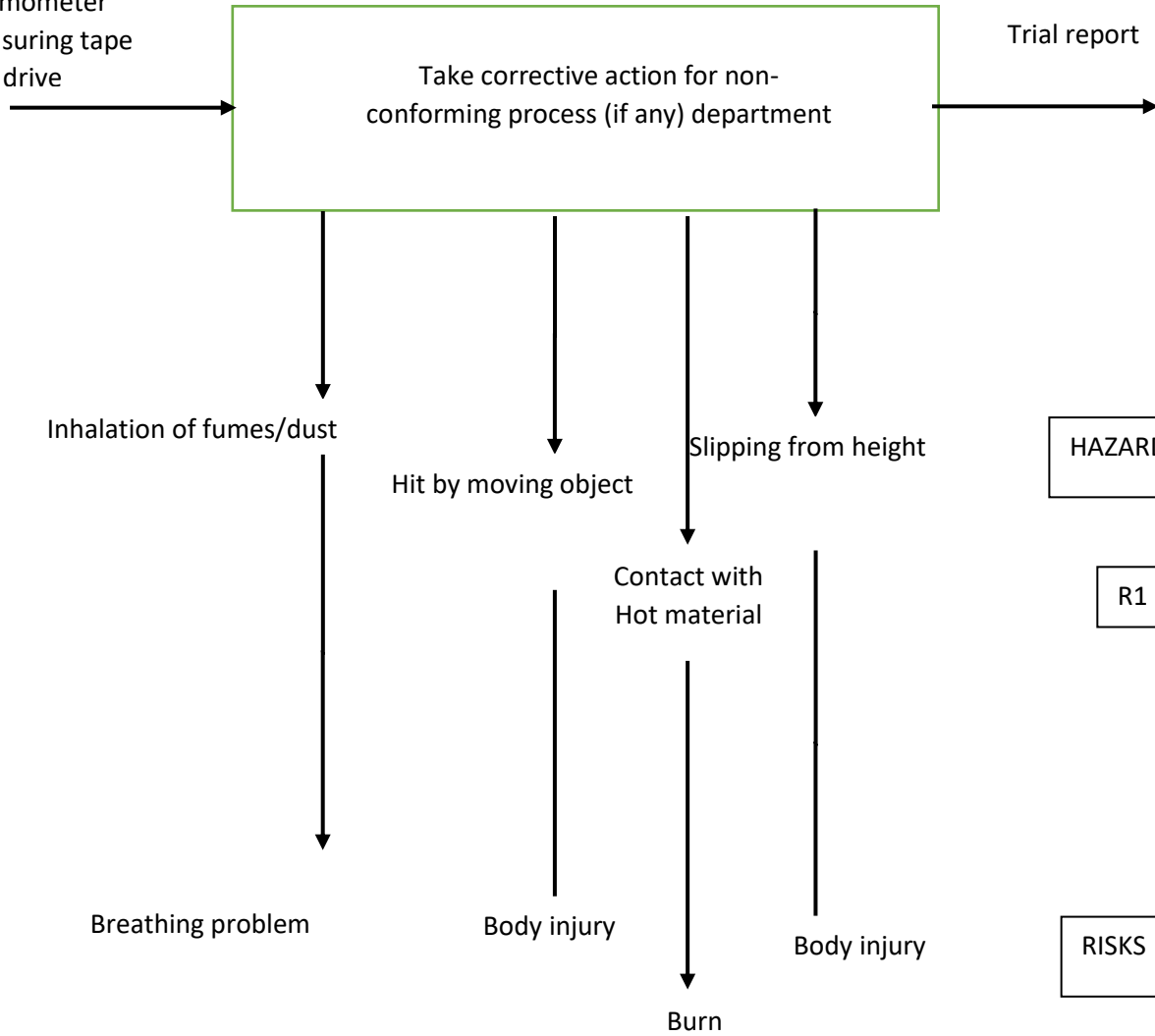
Department: Technical

Section: Process

Area: EXT,BAK,PI,GRA

Date: 18.11.24

Manpower
Digital/Mercury
thermometer
Measuring tape
USB drive



Person carrying out hazard identification: Name:

Sign

Worker participated/consulted:

Name:

Sign

Endorsement by DH:

Name:

Sign

CONTROLLED DOCUMENT
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TITLE: Master List of Documents for Process Department

Sr No	Document No.	Document Title	Controlled Copy No.	Controlled Copy Distribution To	Latest Revision		
					No	Date	
1	GID-MR-FH-01	Carry out the process audit at various stage	1	DH (TECH)	3	18.11.24	R3
			2	MR	3	18.11.24	
2	GID-MR-FH-01	Monitor Trial in consultation with respective user department	1	DH (TECH)	3	18.11.24	R3
			2	MR	3	18.11.24	
3	GID-MR-FH-01	Take corrective action for non-conforming process (if any)	1	DH (TECH)	3	18.11.24	R3
			2	MR	3	18.11.24	

SUMMARY

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	
															Management Programme	Work Instruction		
Inhalation of fumes/dust	X			Breathing problem	1	5	5	2										Y
Hit by moving object	X			Body injury	3	1	3	1	LR	SG	PRO-1.1.1	Safe place to work	N	N	N	GL-PRO-02		Y
Contact with hot material	X			Burn	1	1	1	2	_	NS	_	safe place to work	N	N	_	GL-PRO-02		Y
Slipping from height	X			Body injury	2	1	2	1	LR	SG	PRO-1.1.2	Safe place to work	N	N	N	GL-PRO-02		Y
Inhalation of fumes/dust	X			Breathing problem	1	5	5	2										Y
Hit by moving object	X			Body injury	3	1	3	1	LR	SG	PRO-1.1.1	Safe place to work	N	N	N	GL-PRO-02		Y
Contact with hot material	X			Burn	1	1	1	2	_	NS	_	safe place to work	N	N	_	GL-PRO-02		Y
Slipping from height	X			Body injury	2	1	2	1	LR	SG	PRO-1.1.2	Safe place to work	N	N	N	GL-PRO-02		Y
Inhalation of fumes/dust	X			Breathing problem	1	5	5	2										Y
Hit by moving object	X			Body injury	3	1	3	1	LR	SG	PRO-1.2.1	Safe place to work	N	N	N	GL-PRO-02		Y
Contact with hot material	X			Burn	1	1	1	2	_	NS	_	safe place to work	N	N	_	GL-PRO-02		Y
Slipping from height	X			Body injury	2	1	2	1	LR	SG	PRO-1.2.2	Safe place to work	N	N	N	GL-PRO-02		Y

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX										
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 18.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Technical (Process)																		
ACTIVITY		Monitoring of process parameters at various stage														ACTIVITY No: 1.1				
SUB ACTIVITY		Process audit in Extrusion, Baking, PI and Graphite																		
JOB TYPE		ROUTINE/NON ROUTINE ROUTINE																		
INPUTS		Manpower, Digital/Mercury thermometer, Checklist Format, Measuring tape																		
OUTPUT		Filled Checklist (GID-TEC-F008, F039, F015, F016, F022, F023, F024, F040, F041)																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of fumes/dust	X			Breathing problem	1	5	5	2										Y		
Hit by moving object	X			Body injury	3	1	3	1	LR	SG	PRO-1.1.1	Safe place to work	N	N	N	GL-PRO-02	Y			
Contact with hot material	X			Burn	1	1	1	2	-	NS	-	safe place to work	N	N	-	GL-PRO-02	Y			
Slipping from height	X			Body injury	2	1	2	1	LR	SG	PRO-1.1.2	Safe place to work	N	N	N	GL-PRO-02	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

CONTROLLED DOCUMENT
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Signature of Section in Charge

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 18.11.2024		No: GID-PRO-HIRA-1.0																		
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Technical (Process)																			
ACTIVITY	Monitoring of process parameters at various stage																ACTIVITY No: 1.2			
SUB ACTIVITY	Conduct/Monitor Trial in consultation with respective user department																			
JOB TYPE	ROUTINE/NON ROUTINE NON ROUTINE																			
INPUTS	Manpower, Digita/Mercuryl thermometer, Measuring tape, USB drive, GID-TEC-F001 (Request for Plant test/Design) & GID-TEC-F033 (Request for approval of change in practice)																			
OUTPUT	Trial report																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes/dust	X			Breathing problem	1	5	5	2										Y		
Hit by moving object	X			Body injury	3	1	3	1	LR	SG	PRO-1.2.1	Safe place to work	N	N	N	GL-PRO-02	Y			
Contact with hot material	X			Burn	1	1	1	2	-	NS	-	safe place to work	N	N	-	GL-PRO-02	Y			
Slipping from height	X			Body injury	2	1	2	1	LR	SG	PRO-1.2.2	Safe place to work	N	N	N	GL-PRO-02	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

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Signature of Section in Charge



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-PRO-HIRA-1.0																		
REV NO : 02																				
DATE : 18.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Technical (Process)																			
ACTIVITY	Monitoring of process parameters at various stage															ACTIVITY No: 1.3				
SUB ACTIVITY	Take corrective action for non-conforming process (if any)																			
JOB TYPE	ROUTINE/NON ROUTINE NON ROUTINE																			
INPUTS	Manpower, Digital/Mercury thermometer, Measuring tape, USB drive (as & when required)																			
OUTPUT	Trial result																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes/dust	X			Breathing problem	1	5	5	2										Y		
Hit by moving object	X			Body injury	3	1	3	1	LR	SG	PRO-1.3.1	Safe place to work	N	N	N	GL-PRO-02	Y			
Contact with hot material	X			Burn	1	1	1	2	-	NS	-	safe place to work	N	N	-	GL-PRO-02	Y			
Slipping from height	X			Body injury	2	1	2	1	LR	SG	PRO-1.3.2	Safe place to work	N	N	N	GL-PRO-02	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

CONTROLLED DOCUMENT
(If this Stamp is in red)

H. N. Adar

DPAR

Signature of Section in Charge

B. L. G.

Signature of DH

GRAPHITE INDIA LIMITED, DURGAPUR
DOCUMENT CHANGE REQUEST

DCR No. OHS-8.4

1. Document to Change (L1-AQSM / L2-QSPM / L3) : L3
 1.1 Department Name : BY product
 1.2 Change Proposed by & Dt : C.P.DHANUKA & 10.11.2024

2. Document Revision Details:

Sr.No.	Procedure no/ Document No.	Procedure / Document Title	Page No.	Current Issue No.	Current Revision No. & Date
1	GID-BYPRO-HIRA-1.1	Bagging , weighing of Graphite fines/ RH / Coke Fines / Demco	All	NA	R1; 10.11.23
2	GID-BYPRO-HIRA-1.2	Shifting, storage & Loading of Graphite fines/ RH/ BT Chips / Coke Fines / Demco	All	NA	R1; 10.11.23
3	GID-BYPRO-HIRA-1.3	Screening of Graphite fines	All	NA	R1; 10.11.23
4	GID-BYPRO-HIRA-2.0	Loading of Pitch Coke	All	NA	R1; 10.11.23
5	GID-BYPRO-HIRA-3.0	Handling & Loading of Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR Reject, Rubbish Material	All	NA	R1; 10.11.23
6	GID-BYPRO-HIRA-4.0	Handling, Storage & dispatch of Coal tar pitch in drums	All	NA	R1; 10.11.23

3. Change proposed:

Yearly revision of HIRA matrix

4. Reason for change:

AS per OHS requirement

5. Proposer's Sign

: 6. Applicable for L3 Documents:6.1 Change in L3 document REQUIRE / DOES NOT REQUIRE any change in L-2 document.

6.1.1 If L2 require Change, Procedure No.

Pgno. NA

6.1.2 Processed L2 DCR No.

: NA

6.2 Approved by Dept. Head (Name):

: Mr.V.K.Saxena

6.2.1 Signature of DH

: 

6.3 Revision effective from dt

: _____

7. Applicable for L1 / L2 Documents

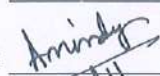
Recommended/Approved by Plant Head

: NA8. Applicable for L1 Documents

Approved by ED

: NA

9. MR's Sign. & Date

: 
10/11

BY-PRODUCT DEPARTMENT

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED

(Graphite Electrode Division, Durgapur)

Sagarbhanga, Durgapur – 713211
West Bengal, India

Summary of By-Product Department HIRA matrix

Total Hazard Identification	24
Significant	8
LR	8
Highest P value	6
No. of Heighest P Value	1


ASH

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE				
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N)	Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	X			1	5	5	2						N	N	N		Y				
Contact with skin	X			1	5	5	2						N	N	N		Y				
Slipping	X			2	1	2	1	LR	SG	BYPRO 1.1.1	Safe Work place		N	N	N		Y				
Continuous carrying of weight	X			1	5	5	2						N	N	N		Y				
Inhalation of dust	X			1	5	5	2						N	N	N		Y				
Contact with skin	X			1	5	5	2						N	N	N		Y				
Slipping	X			2	1	2	1	LR	SG	BYPRO 1.1.2	Safe Work place		N	N	N		Y				
Continuous carrying of weight	X			1	5	5	2						N	N	N		Y				
Inhalation of dust	X			1	5	5	2						N	N	N		Y				
Contact with skin	X			1	5	5	2						N	N	N		Y				
Slipping	X			2	1	2	1	LR	SG	BYPRO 1.1.3	Safe Work place		N	N	N		Y				
Continuous carrying of weight	X			1	5	5	2						N	N	N		Y				
Inhalation of dust	X			1	5	5	2						N	N	N		Y				
Contact with skin	X			1	5	5	2						N	N	N		Y				
Slipping from height	X			2	1	2	1	LR	SG	BYPRO 2.0.0	Safe Work place		N	N	N		Y				
Inhalation of dust	X			1	5	5	2						N	N	N		Y				
Contact with skin	X			1	5	5	2						N	N	N		Y				
Slipping	X			2	1	2	1	LR	SG	BYPRO 3.0.1	Safe Work place		N	N	N		Y				
Continuous carrying of weight	X			1	5	5	2						N	N	N		Y				
Pressing between Two Object	X			2	3	6	2	LR	SG	BYPRO 3.0.2	Safe Work place		N	N	N		Y				
Inhalation of dust	X			1	5	5	2						N	N	N		Y				
Contact with skin	X			1	5	5	2						N	N	N		Y				
Slipping	X			2	1	2	1	LR	SG	BYPRO 4.0.1	Safe Work place		N	N	N		Y				
Fire / contact with hot material	X			2	2	4	1	LR	SG	BYPRO 4.0.2	Safe Work place		N	N	N		Y				

Handwritten signature

Graphite India Limited (GE Division) Durgapur	MASTER LIST
REV. NO: 02 DT: 10.11.2024	NO: ML-BYPRO-04

Sr No	Document No.	Document Title	Controlled Copy No	Controlled Copy Distribution To	Latest Revision	
					No	Date
1	GID-BYPRO-HIRA-1.1	Bagging , weighing of Graphite fines/ RH / Coke Fines / Demco	1	DH (Technical)	02	10.11.24
			2	MR	02	10.11.24
2	GID-BYPRO-HIRA-1.2	Shifting, storage & Loading of Graphite fines/ RH/ BT Chips / Coke Fines / Demco	1	DH (Technical)	02	10.11.24
			2	MR	02	10.11.24
3	GID-BYPRO-HIRA-1.3	Screening of Graphite fines	1	DH (Technical)	02	10.11.24
			2	MR	02	10.11.24
4	GID-BYPRO-HIRA-2.0	Loading of Pitch Coke	1	DH (Technical)	02	10.11.24
			2	MR	02	10.11.24
5	GID-BYPRO-HIRA-3.0	Handling & Loading of Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR Reject, Rubbish Material	1	DH (Technical)	02	10.11.24
			2	MR	02	10.11.24
6	GID-BYPRO-HIRA-4.0	Handling, Storage & dispatch of Coal tar pitch in drums	1	DH (Technical)	02	10.11.24
			2	MR	02	10.11.24

CONTROLLED DOCUMENT (If this Stamp is in red)	COPY NO	APPROVED & ISSUED BY	PAGE NO.
			1 OF 1

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																					
No: GID-BYPRO-HIRA-1.0																					
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																					
DEPARTMENT | Technical (By product)																					
ACTIVITY | Bagging, weighing, shifting, screening, Storage & Loading of Graphite fines/ RH / BT Chips/ Coke Fines / Demco																					
SUB ACTIVITY | Bagging, weighing of Graphite fines/ RH / Coke Fines / Demco																					
JOB TYPE | ROUTINE /NON-ROUTINE																					
INPUTS | Graphite fines/ RH /LWG/ Coke Fines / Demco HDPE bags, stitching machine, PPE																					
OUTPUT | Graphite fines/ RH /LWG/ Coke Fines / Demco bagged & weighing done																					
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				Mitigation Plan			RESIDUAL SCORE									
	N	A	E		S	O	P=SXC	D	LR/OR	SG/NS	SHNo	Opportunity	Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC	
Inhalation of dust	X			Breathing Problem	1	5	5	2				N	N	N		Y					
Contact with skin	X			Allergy	1	5	5	2				N	N	N		Y					
Slipping	X			Body injury	2	1	2	1	LR	SG	BYPRO 1.1.1	N	N	N		Y					
Continuous carrying of weight	X			Sprain	1	5	5	2				N	N	N		Y					

26 Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

[Signature]

Signature of Section in Charge

[Signature]

Signature of DH

CONTROLLED DOCUMENT
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED DURGAPUR, WEST BENGAL		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																			
REV NO :	02	IDENTIFICATION & EVALUATION OF HAZARDS & RISK										No: GID-BYPRO-HIRA-1.0									
DATE :	10.11.2024																				
DEPARTMENT	Technical (By product)																				
ACTIVITY	Bagging, weighing, shifting, screening, storage & loading of Graphite fines/ RH / BT Chips/ Coke Fines / Demco																				
SUB ACTIVITY	Screening of Graphite fines	ACTIVITY No: 1.0																			
JOB TYPE	ROUTINE /NON-ROUTINE	SUB ACTIVITY No: 1.3																			
INPUTS	Graphite fines/HDPE bags, stitching machine, PPE, / Screener																				
OUTPUT	Screened Graphite fines																				
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Elimination (Y/N)	Substitution (Y/N)	Mitigation Plan		Administrative Control (Y/N) Work Instruction	PPE (Y/N)	RESIDUAL SCORE		
	N	A	E		S	O	P-SXO	D							Engineered Control Management Programme	S			O	P-SXO	
Inhalation of dust	X			Breathing Problem	1	5	5	2					N	N	N			Y			
Contact with skin	X			Allergy	1	5	5	2					N	N	N			Y			
Slipping	X			Body injury	2	1	2	1	LR	SG	BYPRO 1.1.3	Safe Work place	N	N	N			Y			
Continuous carrying of weight	X			Sprain	1	5	5	2					N	N	N			Y			

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

John C.P.S.

Signature of Section in Charge

CONTROLLED DOCUMENT
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[Signature]

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED
DURGAPUR, WEST BENGAL
REV NO : 02
DATE : 10.11.2024

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX
No: GID-BYPRO-HIRA-2.0

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT Technical (By product)
ACTIVITY Loading of Pitch Coke
SUB ACTIVITY NA
JOB TYPE ROUTINE /NON-ROUTINE
INPUTS Baged Pitch coke, PPE, fuel
OUTPUT Loaded truck

ACTIVITY No: 2.0
SUB ACTIVITY No: NA

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Elimination (Y/N)	Substitution (Y/N)	Mitigation Plan		PPE (Y/N)	RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D							Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction		S	O	P=SXO
Inhalation of dust	X			1	5	5	2						N	N	N		Y			
Contact with skin	X			1	5	5	2						N	N	N		Y			
Slipping from height	X			2	1	2	1	LR	SG	BYPRO 2.0.0	Safe Work place		N	N	N		Y	WI-BYPRO-03		

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

[Signature]

Signature of Section in Charge

CONTROLLED DOCUMENT
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[Signature]

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED DURGAPUR, WEST BENGAL		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
REV NO :	02	No: GID-BYPRO-HIRA-3.0																		
DATE :	10.11.2024	IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Technical (By product)																			
ACTIVITY	Handling & Loading of Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR Reject, Rubbish Material											ACTIVITY No: 3.0								
SUB ACTIVITY	NA											SUB ACTIVITY No: NA								
JOB TYPE	ROUTINE / NON-ROUHHME																			
INPUTS	Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR reject, Rubbish Material, PPE, JCB																			
OUTPUT	Loaded truck																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION			LR/OR	SG/NS	SHNo	Opportunity	Elimination (Y/N)	Substitution (Y/N)	Mitigation Plan		PPE (Y/N)	RESIDUAL SCORE			
	N	A	E		S	O	P=SXC							D	Engineered Control Management Programme		Administrative Control (Y/N)	Work Instruction	S	O	P=SXC
Inhalation of dust	X			Breathing Problem	1	5	5	2				N	N			Y				
Contact with skin	X			Allergy	1	5	5	2				N	N			Y				
Slipping	X			Body Injury	2	1	2	1	SG	BYPRO 3.0.1	Safe Work place	N	N		WI-BYPRO-04, 05, 06	Y				
Continuous carrying of weight	X			Sprain	1	5	5	2				N	N			Y				
Pressing between Two Object	X			Body Injury	2	3	6	2	SG	BYPRO 3.0.2	Safe Work place	N	N		WI-BYPRO-04, 05, 06	Y				

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable

CONTROLLED DOCUMENT
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[Signature]

Signature of Section in Charge

[Signature]

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED DURGAPUR, WEST BENGAL		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																			
REV NO :	02	No: GID-BYPRO-HIRA-4.0																			
DATE :	10.11.2024	IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Technical (By product)																				
ACTIVITY	Handling, Storage & dispatch of Coal tar pitch in drums																				
SUB ACTIVITY	INA	ACTIVITY No: 4.0																			
JOB TYPE	ROUTINE /NON-ROUTINE	SUB ACTIVITY No: NA																			
INPUTS	Drum filled with coal tar pitch, PPE																				
OUTPUT	Loaded truck																				
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				Mitigation Plan			RESIDUAL SCORE									
	N	A	E		S	O	P=SXO	D	LR/OR	SG/NS	SHNo	Opportunity	Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N)	Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust	X			1	5	5	2					Breathing Problem	N	N	N			Y			
Contact with skin	X			1	5	5	2					Allergy	N	N	N			Y			
Slipping	X			2	1	2	1	LR	SG	BYPR O 4.0.1	Safe Work place	Body Injury	N	N	N		WI-BYPRO-09	Y			
Fire / contact with hot material	X			2	2	4	1	LR	SG	BYPR O 4.0.2	Safe Work place	Burn	N	N	N		WI-BYPRO-09	Y			

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

Signature

Signature of Section in Charge

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Signature

Signature of DH

Graphite India Limited (GE Division) Durgapur	MASTER LIST
REV. NO: 01 DT: 10.11.2023	NO: ML-BYPRO-05

TITLE: Master List of Activity Wise Hazard Identification of By-Product Department

Sr No	Document No.	Document Title	Controlled Copy No	Controlled Copy Distribution To	Latest Revision	
					No	Date
C	GID-MR-FH-001-1.1	Bagging , weighing of Graphite fines/ RH / Coke Fines / Demco	1	DH (Technical)	01	10.11.23
			2	MR	01	10.11.23
2	GID-MR-FH-001-1.2	Shifting, storage & Loading of Graphite fines/ RH/ BT Chips / Coke Fines / Demco	1	DH (Technical)	01	10.11.23
			2	MR	01	10.11.23
3	GID-MR-FH-001-1.3	Screening of Graphite fines	1	DH (Technical)	00	10.11.22
			2	MR	00	10.11.22
4	GID-MR-FH-001-2.0	Loading of Pitch Coke	1	DH (Technical)	00	10.11.22
			2	MR	00	10.11.22
5	GID-MR-FH-001-3.0	Handling & Loading of Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR Reject, Rubbish Material	1	DH (Technical)	00	10.11.22
			2	MR	00	10.11.22
6	GID-MR-FH-001-4.0	Handling, Storage & dispatch of Coal tar pitch in drums	1	DH (Technical)	00	10.11.22
			2	MR	00	10.11.22

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PAGE NO.

1 OF 1

GRAPHITE INDIA LIMITED, DURGAPUR

GID-MR-FH-001
R0 wef 25.08.2022

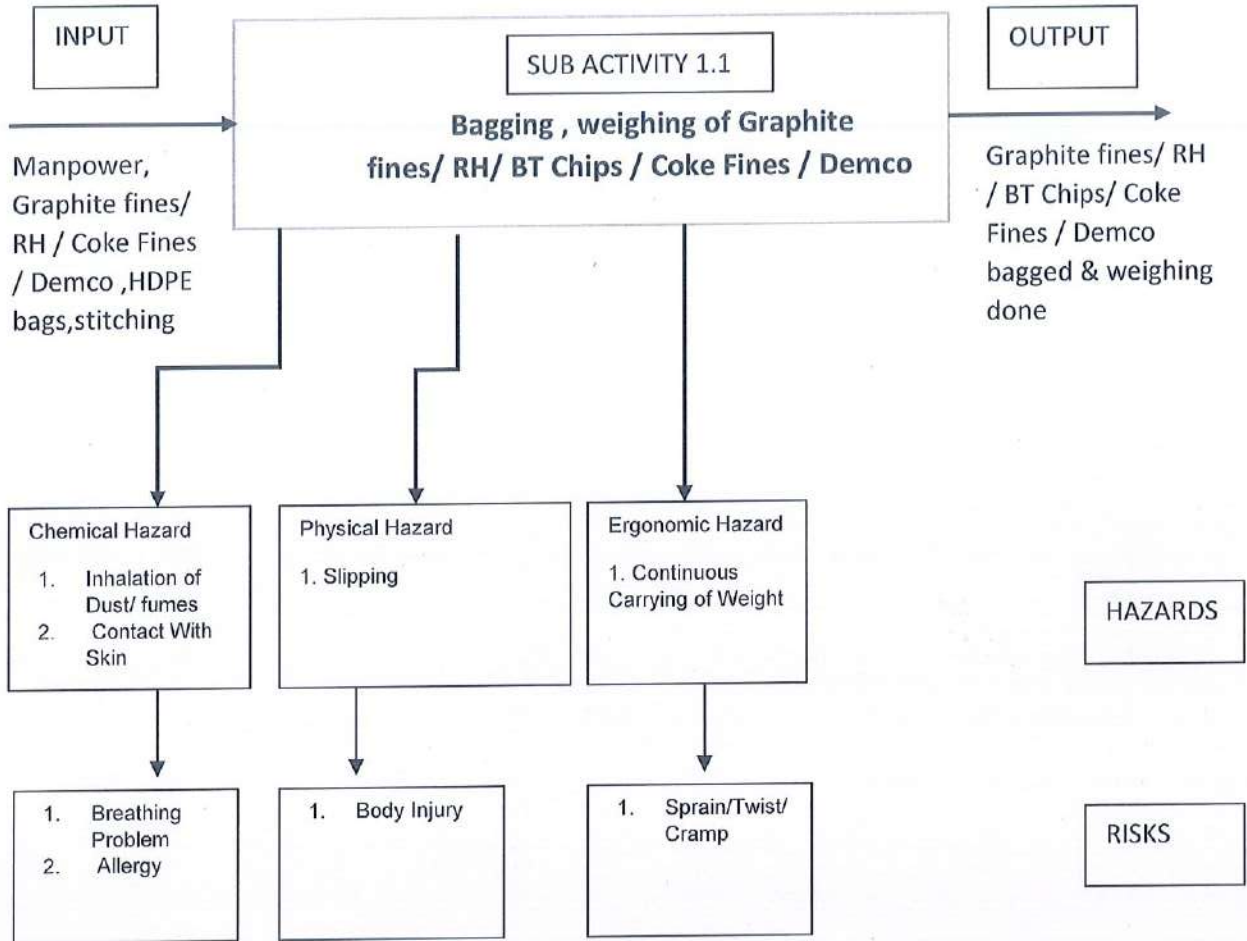
ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

Section: By-Product

Area: NA

Date: 10.11.2024



Person carrying out hazard identification: Name: *C. P. Dhanuka*

Sign: *[Signature]*

Worker participated/consulted: Name:

Sign:

Endorsement by DH:

Name: *VKSaxena*

Sign: *[Signature]*

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GRAPHITE INDIA LIMITED, DURGAPUR

GID-MR-FH-001
R0 wef 25.08.2022

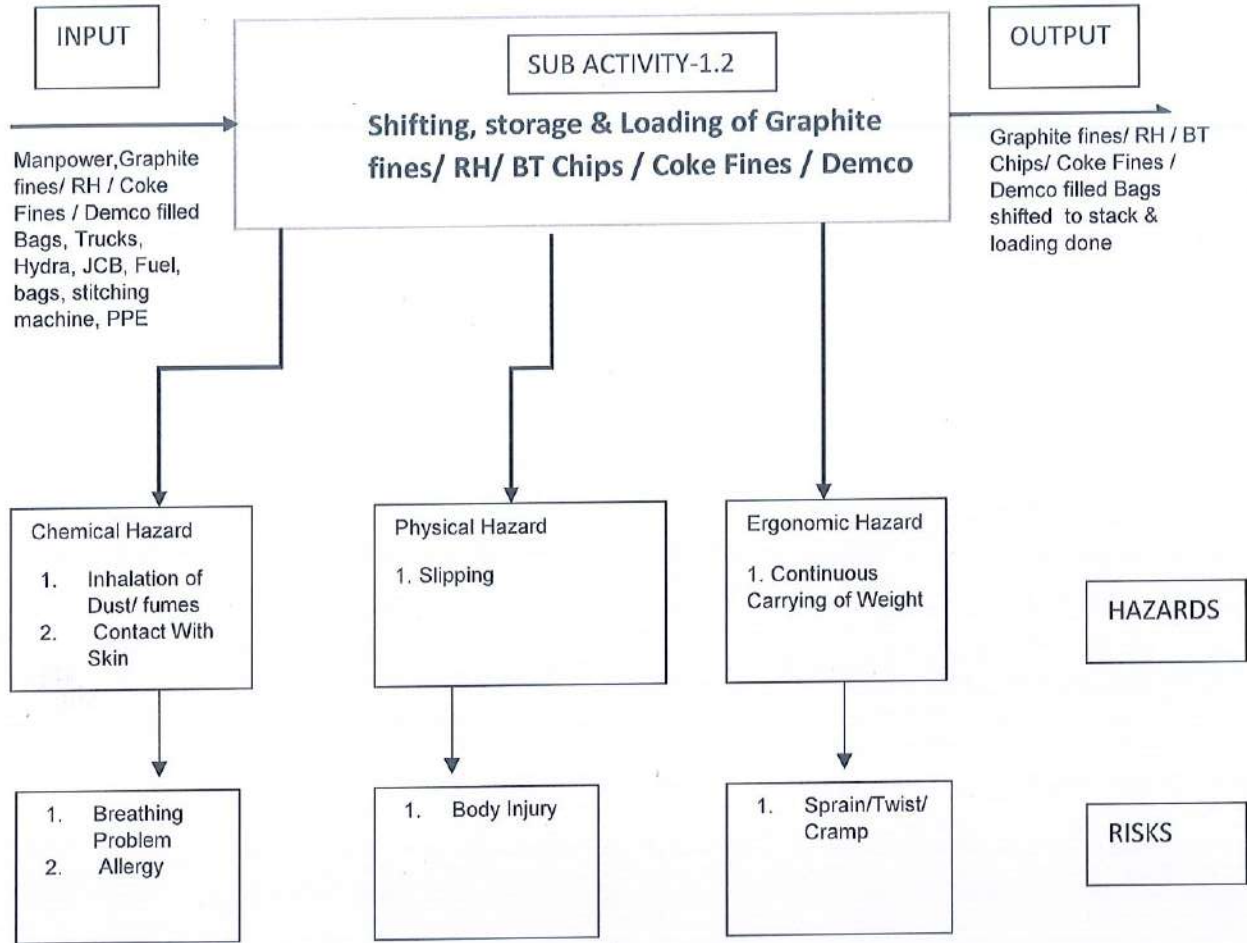
ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

Section: By-Product

Area: NA

Date: 10.11.2024



Person carrying out hazard identification: Name: C. P. Dhanuka Sign: [Signature]

Worker participated/consulted: Name: Sign

Endorsement by DH: Name: V K Sarkena Sign: [Signature]

CONTROLLED DOCUMENT
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GRAPHITE INDIA LIMITED, DURGAPUR

GID-MR-FH-001
R0 wef 25.08.2022

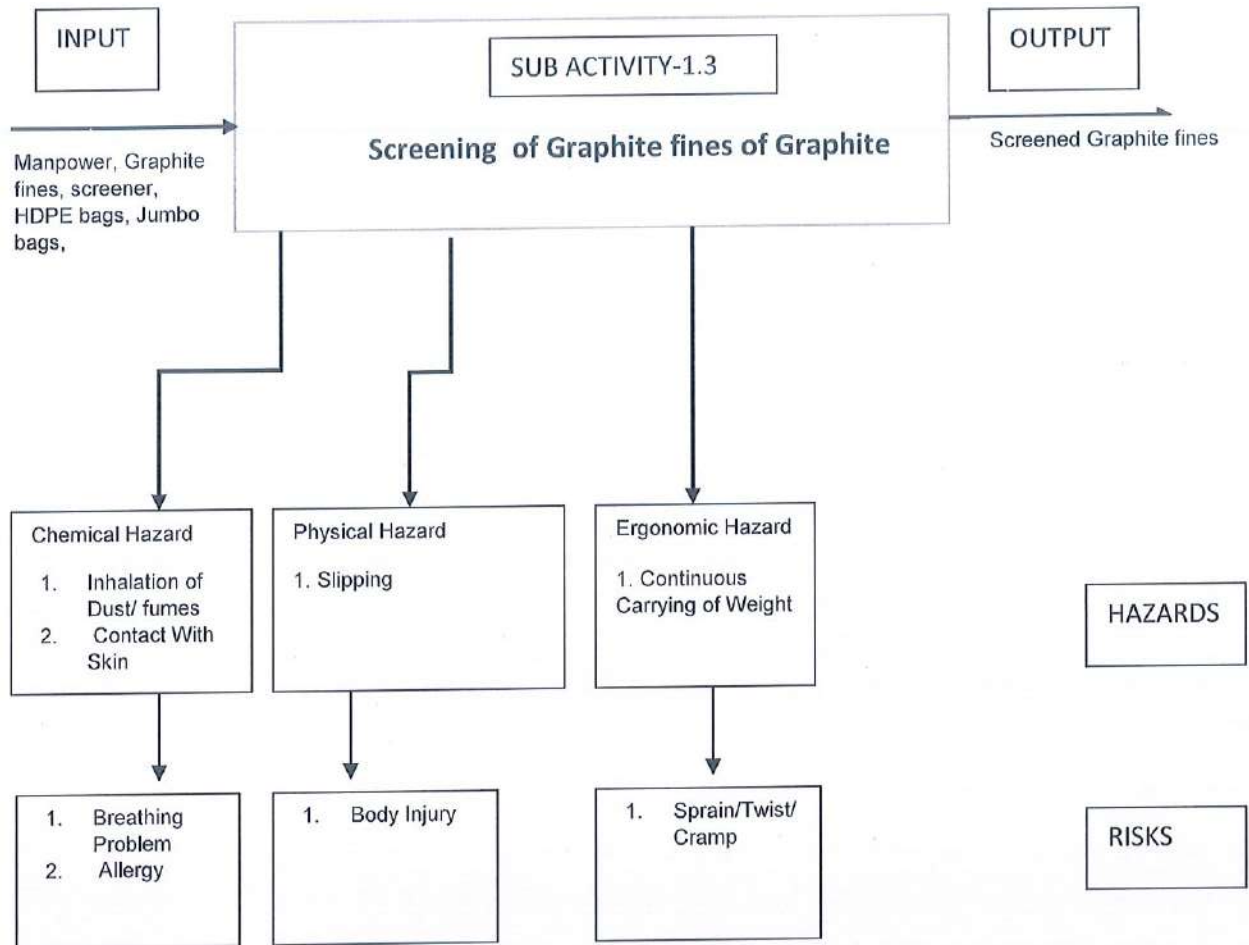
ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

Section: By-Product

Area: NA

Date: 10.11.2024



Person carrying out hazard identification: Name: *C. P. Dhamelka* Sign: *[Signature]*

Worker participated/consulted: Name: Sign:

Endorsement by DH: Name: *V K Saxena* Sign: *[Signature]*

CONTROLLED DOCUMENT
(If this Stamp is in red)

GRAPHITE INDIA LIMITED, DURGAPUR

GID-MR-FH-001
R0 wef 25.08.2022

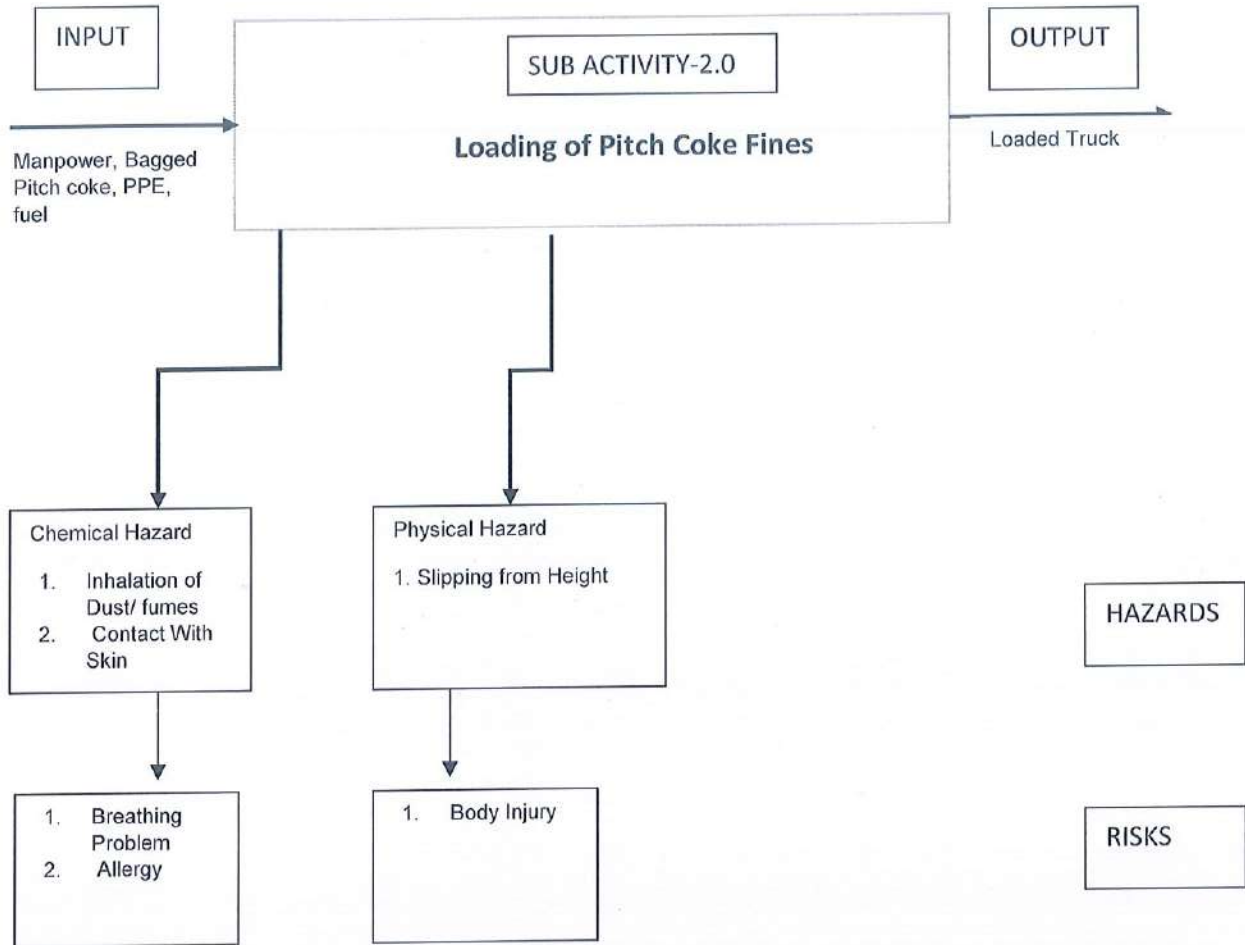
ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

Section: By-Product

Area: NA

Date: 10.11.2024



Person carrying out hazard identification: Name: *e. P. Dhanuka*

Sign: *[Signature]*

Worker participated/consulted: Name:

Sign

Endorsement by DH:

Name: *VK Saranya*

Sign: *[Signature]*

CONTROLLED DOCUMENT
(If this Stamp is in red)

GRAPHITE INDIA LIMITED, DURGAPUR

GID-MR-FH-001
R0 wef 25.08.2022

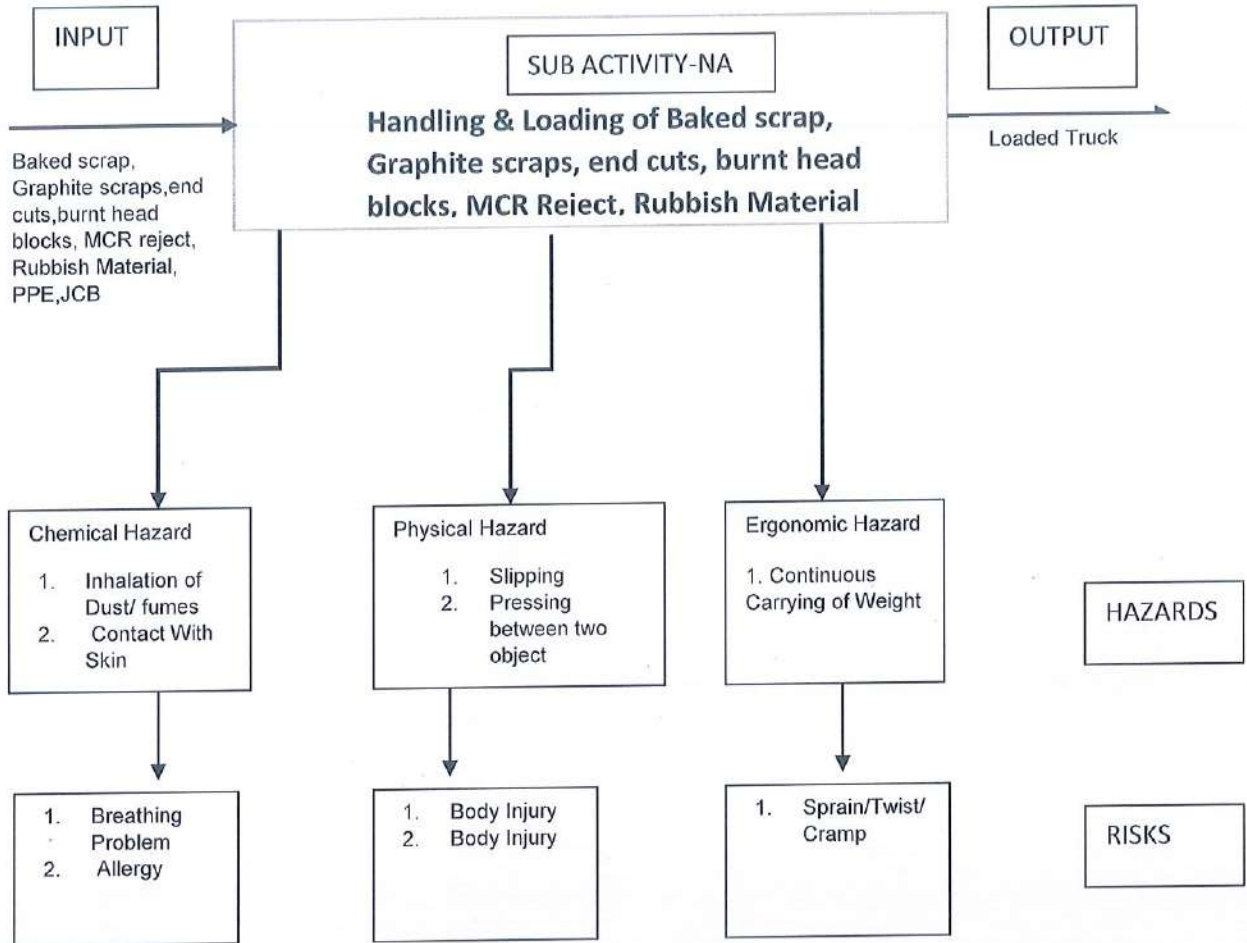
ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

Section: By-Product

Area: NA

Date: 10.11.2024



Person carrying out hazard identification: Name: *C. P. Dhanuka* Sign: *C.P.D.*

Worker participated/consulted: Name: Sign:

Endorsement by DH: Name: *Vk Sarcena* Sign: *Vk Sarcena*

CONTROLLED DOCUMENT
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GRAPHITE INDIA LIMITED, DURGAPUR

GID-MR-FH-001
R0 wef 25.08.2022

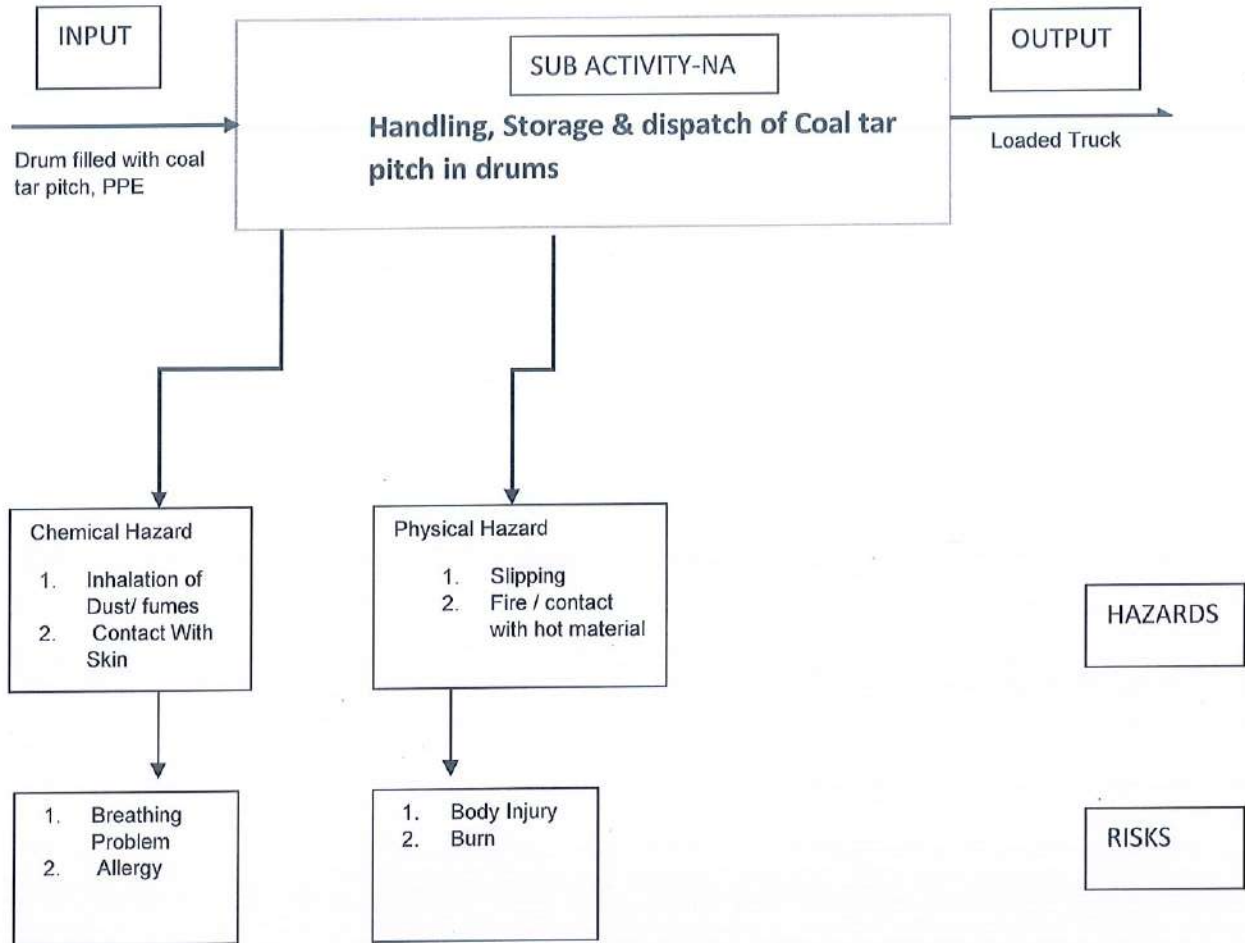
ACTIVITYWISE HAZARD IDENTIFICATION

Department: Technical

Section: By-Product

Area: NA

Date: 10.11.2024



Person carrying out hazard identification: Name: C. P. Dhanuka. Sign: [Signature]

Worker participated/consulted: Name: Sign

Endorsement by DH: Name: VKSaxena. Sign: [Signature]

CONTROLLED DOCUMENT
(If this Stamp is in red)

Graphite India Limited, Durgapur 713211

Hazard identification & Risk Assessment

Index

Sr.No.	Activity No.	Hazard Identification Activity Detail	Activity wise Hazard Identification Date
1	1.1	Bagging , weighing of Graphite fines/ RH /LWG/ Coke Fines / Demco	10.11.2024
2	1.2	Shifting, storage & Loading of Graphite fines/ RH/ BT Chips /LWG/ Coke Fines / Demco	10.11.2024
3	1.3	Screening of Graphite fines	10.11.2024
4	2.0	Loading of Pitch Coke	10.11.2024
5	3.0	Handling & Loading of Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR Reject, Rubbish Material	10.11.2024
6	4.0	Handling, Storage & dispatch of Coal tar pitch in drums	10.11.2024

Sr.No.	Procedure no/ Document No.	Procedure / Document Title Current Revision No.	Current Revision No.	Current Revision Date
1	GID-BYPRO-HIRA-1.1	Bagging , weighing of Graphite fines/ RH /LWG/ Coke Fines / Demco	2	10.11.2024
2	GID-BYPRO-HIRA-1.2	Shifting, storage & Loading of Graphite fines/ RH/ BT Chips /LWG/ Coke Fines / Demco	2	10.11.2024
3	GID-BYPRO-HIRA-1.3	Screening of Graphite fines	2	10.11.2024
4	GID-BYPRO-HIRA-2.0	Loading of Pitch Coke	2	10.11.2024
5	GID-BYPRO-HIRA-3.0	Handling & Loading of Baked scrap, Graphite scraps, end cuts, burnt head blocks, MCR Reject, Rubbish Material	2	10.11.2024
6	GID-BYPRO-HIRA-4.0	Handling, Storage & dispatch of Coal tar pitch in drums	2	10.11.2024

Asm

SWOT & HIRA / AIM LINK DOCUMENT

SI No.	Weakness	Relevant AIM and HIRA Matrix	Mitigation Plan
1	Slippery product and floors	GID-BYPRO-HIRA-1.1.1	WI-BYPRO-01, 02,07
		GID-BYPRO-HIRA-1.1.2	WI-BYPRO-01, 02,07
		GID-BYPRO-HIRA-1.1.3	WI-BYPRO-01
		GID-BYPRO-HIRA-2.0	WI-BYPRO-03
		GID-BYPRO-HIRA-3.0.1	WI-BYPRO-04, 05, 06
		GID-BYPRO-HIRA-4.0.1	WI-BYPRO-09

SI No.	Threats	Relevant AIM and HIRA Matrix	Mitigation Plan
1	Dust emission	GID-BYPRO-AIM-1.1	WI-BYPRO-01
		GID-BYPRO-AIM-1.2	WI-BYPRO-01
		GID-BYPRO-AIM-1.3	WI-BYPRO-01
		GID-BYPRO-AIM-1.4	WI-BYPRO-01
		GID-BYPRO-AIM-2.1	WI-BYPRO-02 WI-BYPRO-03 WI-BYPRO-07
		GID-BYPRO-AIM-2.2	WI-BYPRO-02; WI-BYPRO-03 WI-BYPRO-07
		GID-BYPRO-AIM-4.0	WI-BYPRO-06
		GID-BYPRO-AIM-5.0	WI-BYPRO-06
		GID-BYPRO-AIM-6.0	WI-BYPRO-08
		GID-BYPRO-AIM-9.0	WI-BYPRO-01

John

Graphite India Limited (GE Division) Durgapur	MASTER LIST
REV. NO: 02 DT : 10.11.2024	NO: ML-MNT-12

TITLE : MASTER LIST OF MAINTENANCE HAZARD & RISK DOCUMENTS

SL No	Document No.	Document Title	Controlled Copy No.	Controlled Copy Distribution To	Latest Revision	
					No	Date
	HIRA-26	Soldering and Brazing Processes				10.11.2024
27	GID-MNT-HIRA-27	Maintenance of CBM Gas lines	1	DH (MAINT)	02	10.11.2024
			2	MR		
28	GID-MNT-HIRA-28	Maintenance of Crane Mounted Milling	1	DH (MAINT)	02	10.11.2024
			2	MR		
29	GID-MNT-HIRA-29	Maintenance of FO and Diesel storage tanks	1	DH (MAINT)	02	10.11.2024
			2	MR		
30	GID-MNT-HIRA-30	Implementation of 'Lock Out Tag Out' (LOTO) Practice	1	DH (MAINT)	02	10.11.2024
			2	MR		
31	GID-MNT-HIRA-31	Maintenance of vacuum pumps	1	DH (MAINT)	02	10.11.2024
			2	MR		
32	GID-MNT-HIRA-32	Maintenance of pitch pumps	1	DH (MAINT)	02	10.11.2024
			2	MR		
33	GID-MNT-HIRA-33	Maintenance of Waste Oil Room	1	DH (MAINT)	02	10.11.2024
			2	MR		

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	1		3 OF 3

Graphite India Limited (GE Division) Durgapur	MASTER LIST
REV. NO: 02 DT : 10.11.2024	NO: ML-MNT-12

TITLE : MASTER LIST OF MAINTENANCE HAZARD & RISK DOCUMENTS

SL No	Document No.	Document Title	Controlled Copy No.	Controlled Copy Distribution To	Latest Revision	
					No	Date
01	GID-MNT-HIRA-1	Maintenance of Pumps (water, oil).	1	DH (MAINT)	02	10.11.2024
			2	MR		
02	GID-MNT-HIRA-2	Maintenance and Operation of Air Compressors.	1	DH (MAINT)	02	10.11.2024
			2	MR		
03	GID-MNT-HIRA-3	Maintenance of crane/hoist	1	DH (MAINT)	02	10.11.2024
			2	MR		
04	GID-MNT-HIRA-4	Maintenance of DG set.	1	DH (MAINT)	02	10.11.2024
			2	MR		
05	GID-MNT-HIRA-5	Maintenance of ETP and ESP	1	DH (MAINT)	02	10.11.2024
			2	MR		
06	GID-MNT-HIRA-6	Maintenance of Elevator	1	DH (MAINT)	02	10.11.2024
			2	MR		
07	GID-MNT-HIRA-7	Maintenance of vibrating feeder/Belt/Screw Conveyor and screener	1	DH (MAINT)	02	10.11.2024
			2	MR		
08	GID-MNT-HIRA-8	Maintenance of Fork Truck/Dumper	1	DH (MAINT)	02	10.11.2024
			2	MR		
09	GID-MNT-HIRA-9	Maintenance of gear boxes.	1	DH (MAINT)	02	10.11.2024
			2	MR		
10	GID-MNT-HIRA-10	Maintenance of hydraulic system	1	DH (MAINT)	02	10.11.2024
			2	MR		
			3	EXTRUSION		
			4	BAKING		
			5	GRAPHITE		
			6	FINISHING		
11	GID-MNT-HIRA-11	Maintenance of electric motors	1	DH (MAINT)	02	10.11.2024
			2	MR		
12	GID-MNT-HIRA-12	Maintenance of transformer.	1	DH (MAINT)	02	10.11.2024
			2	MR		

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Graphite India Limited (GE Division) Durgapur	MASTER LIST
REV. NO: 02 DT : 10.11.2024	NO: ML-MNT-12

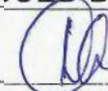
TITLE : MASTER LIST OF MAINTENANCE HAZARD & RISK DOCUMENTS

SL No	Document No.	Document Title	Controlled Copy No.	Controlled Copy Distribution To	Latest Revision	
					No	Date
13	GID-MNT-HIRA-13	Maintenance of rectoformer	1	DH (MAINT)	02	10.11.2024
			2	MR		
14	GID-MNT-HIRA-14	Maintenance of cooling tower	1	DH (MAINT)	02	10.11.2024
			2	MR		
15	GID-MNT-HIRA-15	Maintenance of electronic equipments	1	DH (MAINT)	02	10.11.2024
			2	MR		
16	GID-MNT-HIRA-16	Maintenance of air conditioner & water cooler	1	DH (MAINT)	02	10.11.2024
			2	MR		
17	GID-MNT-HIRA-17	Maintenance of fans and blowers	1	DH (MAINT)	02	10.11.2024
			2	MR		
18	GID-MNT-HIRA-18	Maintenance of MCC/PCC/Switch yard	1	DH (MAINT)	02	10.11.2024
			2	MR		
19	GID-MNT-HIRA-19	Maintenance of dust collector.	1	DH (MAINT)	02	10.11.2024
			2	MR		
20	GID-MNT-HIRA-20	Maintenance/Operation of Machining Equipments	1	DH (MAINT)	02	10.11.2024
			2	MR		
21	GID-MNT-HIRA-21	Maintenance of HT/LT breaker	1	DH (MAINT)	02	10.11.2024
			2	MR		
22	GID-MNT-HIRA-22	Maintenance and operation of boiler	1	DH (MAINT)	02	10.11.2024
			2	MR		
23	GID-MNT-HIRA-23	Maintenance of DCDB and battery bank	1	DH (MAINT)	02	10.11.2024
			2	MR		
24	GID-MNT-HIRA-24	Maintenance of Thermopac	1	DH (MAINT)	02	10.11.2024
			2	MR		
25	GID-MNT-HIRA-25	Maintenance of hydraulic and Pneumatic Cylinder	1	DH (MAINT)	02	10.11.2024
			2	MR		
26	GID-MNT-	Welding ,Gas Cutting,	1	DH (MAINT)	02	

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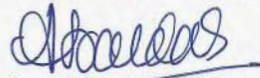
APPLICABILITY OF HIRA IN VARIOUS DEPARTMENTS

SR NO	DESCRIPTION OF HIRA MATRIX	HIRA NO.	DEPARTMENTS				
			EXTRUSION	BAKING	GRAPHITE	FINISHING AND SHIPPING	MAINTENANCE
1	Maintenance of pumps (water,oil)	GID-MNT-HIRA-1	YES	YES	YES	YES	YES
2	Maintenance and Operation of Air compressors	GID-MNT-HIRA-2	YES	YES	YES	YES	YES
3	Maintenance of crane/hoist	GID-MNT-HIRA-3	YES	YES	YES	YES	YES
4	Maintenance of DG set	GID-MNT-HIRA-4	YES	YES	YES	YES	YES
5	Maintenance of ETP and ESP	GID-MNT-HIRA-5	NO	YES	NO	NO	YES
6	Maintenance of elevator	GID-MNT-HIRA-6	YES	YES	YES	NO	YES
7	Maintenance of vibrating feeder/belt/screw conveyor and screener	GID-MNT-HIRA-7	YES	YES	YES	YES	YES
8	Maintenance of Fork Truck/Dumper	GID-MNT-HIRA-8	YES	YES	YES	YES	YES
9	Maintenance of gear boxes	GID-MNT-HIRA-9	YES	YES	YES	YES	YES
10	Maintenance of hydraulic system	GID-MNT-HIRA-10	YES	YES	YES	YES	YES
11	Maintenance of electric motors	GID-MNT-HIRA-11	YES	YES	YES	YES	YES
12	Maintenance of transformer	GID-MNT-HIRA-12	YES	YES	YES	YES	YES
13	Maintenance of rectoformer	GID-MNT-HIRA-13	NO	NO	YES	NO	YES
14	Maintenance of cooling tower	GID-MNT-HIRA-14	YES	YES	YES	YES	YES
15	Maintenance of electronic equipments	GID-MNT-HIRA-15	YES	YES	YES	YES	YES
16	Maintenance of air conditioner & water cooler	GID-MNT-HIRA-16	YES	YES	YES	YES	YES
17	Maintenance of fans and blowers	GID-MNT-HIRA-17	YES	YES	YES	YES	YES
18	Maintenance of MCC/PCC/Switch yard	GID-MNT-HIRA-18	YES	YES	YES	YES	YES
19	Maintenance of dust collector	GID-MNT-HIRA-19	YES	YES	YES	YES	YES
20	Maintenance/Operation of machining equipments	GID-MNT-HIRA-20	NO	NO	NO	NO	YES
21	Maintenance of HT/LT breaker	GID-MNT-HIRA-21	YES	YES	YES	YES	YES
22	Maintenance and operation of boiler	GID-MNT-HIRA-22	YES	NO	NO	NO	YES
23	Maintenance of DCDB and battery bank	GID-MNT-HIRA-23	NO	NO	YES	NO	YES
24	Maintenance of Thermopac	GID-MNT-HIRA-24	YES	YES	NO	NO	YES
25	Maintenance of Hydraulic and Pneumatic Cylinder	GID-MNT-HIRA-25	YES	YES	YES	YES	YES
26	Welding ,Gas Cutting, Soldering and Brazing Processes	GID-MNT-HIRA-26	YES	YES	YES	YES	YES
27	Maintenance of CBM Gas lines	GID-MNT-HIRA-27	YES	YES	NO	NO	YES
28	Maintenance of Crane Mounted Milling	GID-MNT-HIRA-28	NO	NO	YES	NO	YES
29	Maintenance of FO and Diesel storage tanks	GID-MNT-HIRA-29	YES	YES	NO	NO	YES
30	Implementation of 'Lock Out Tag Out' (LOTO) Practice	GID-MNT-HIRA-30	YES	YES	YES	YES	YES
31	Maintenance of vacuum pumps	GID-MNT-HIRA-31	YES	YES	NO	NO	YES
32	Maintenance of pitch pumps	GID-MNT-HIRA-32	YES	YES	NO	NO	YES
33	Maintenance of waste Oil Room	GID-MNT-HIRA-33	YES	YES	YES	YES	YES

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-MNT-HIRA-1																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of pumps (water,oil)																			
SUB ACTIVITY	SUB ACTIVITY No: 1.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, lubricants, asbestos gasket, rubber																			
OUTPUT	Maintained pumps																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT1.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-22	Y			
Slippery Floor	v			Body Injury	5	1	5	2	LR	SG	MNT1.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-22, GL-MNT-08	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
(If This Stamp is in Red)



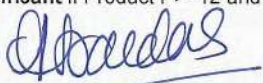
Signature of D-I

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 02		No: GID-MNT-HIRA-2																		
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of Air compressors																			
SUB ACTIVITY	SUB ACTIVITY No: 2.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, lubricants, asbestos gasket, rubber items, diesel, water																			
OUTPUT	Maintained compressors																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Fire	✓			Burn	5	1	5	2	LR	SG	MNT2.0.1	safe place to work	N	N		WI-MNT-13 GL-MNT-04	Y			
Caught in Explosion	✓			Body Injury	3	1	3	1	LR	SG	MNT2.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-13 GL-MNT-04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

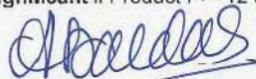
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DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-3																		
REV NO : 02																				
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of crane/hoist																			
SUB ACTIVITY	SUB ACTIVITY No: 3.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, lubricants, asbestos gasket, rubber items, electrical components, wire ropes, cotton																			
OUTPUT	Maintained Crane/Hoist																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Slipping from Height	v			Body Injury	5	1	5	2	LR	SG	MNT3.0.1	Better upkeep of work place	N	N		WI-MNT-19 WI-MNT-20	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT3.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-19 WI-MNT-20	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT3.0.3	safe place to work	N	N		WI-MNT-19 WI-MNT-20	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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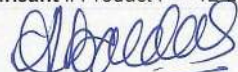


Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-4																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of DG set																			
SUB ACTIVITY	SUB ACTIVITY No: 4.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, lubricants, rubber items, electrical components, cotton																			
OUTPUT	Maintained DG Set																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Working in Noise prone area	v			Interference in communication	1	4	4	1	LR	SG	MNT4.0.1	safe place to work	N	N		WI-MNT-02	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT4.0.2	safe place to work	N	N		WI-MNT-02	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT4.0.3	Reduction in loss of man days due to accident	N	N		WI-MNT-02	Y			
Contact with hot material	v			Burn	2	2	4	1	LR	SG	MNT4.0.4	Reduction in loss of man days due to accident	N	N		WI-MNT-02	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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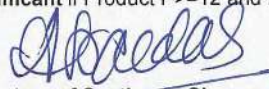


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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-5																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of ETP and ESP																			
SUB ACTIVITY	SUB ACTIVITY No: 5.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, lubricants, asbestos gasket, rubber items, electrical components, welding and cutting sets, steam, cotton																			
OUTPUT	Maintained ETP and ESP																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes	v			Allergic reaction	3	1	3	1		NS		safe place to work	N	N		WI-MNT-57	Y			
Working in confined space	v			Nausea	2	2	4	1		NS		safe place to work	N	N		WI-MNT-57	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT5.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-57	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT5.0.2	safe place to work	N	N		WI-MNT-57	Y			
Falling from height	v			Body Injury	5	1	5	2	LR	SG	MNT5.0.3	safe place to work	N	N		WI-MNT-57	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-MNT-HIRA-6										
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Maintenance																		
ACTIVITY		Maintenance of Elevator																		
SUB ACTIVITY		SUB ACTIVITY No: 6.0																		
JOB TYPE		ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS		Tools and tackles, spares, lubricants, bearings, rubber items, welding Machine and cutting sets, cotton																		
OUTPUT		Maintained Elevators																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
			Management Programme		Work Instruction															
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT6.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-40	Y			
Slipping from Height	v			Body Injury	3	1	3	1	LR	SG	MNT6.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-40	Y			

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

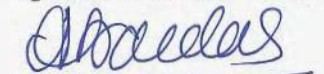
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DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-7																		
REV NO : 02																				
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of vibrating feeder/belt/screw conveyor and screener																			
SUB ACTIVITY	SUB ACTIVITY No: 7.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, lubricants, bearings, rubber items, welding Machine and cutting sets, cotton, electrical components																			
OUTPUT	Maintained vibrating feeder/belt/screw conveyor and screener																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Tripping on obstacle	✓			Body Injury	2	2	4	1	LR	SG	MNT7.0.1	safe place to work	N	N		WI-MNT-01	Y			
Electrocution	✓			Trauma	5	1	5	2	LR	SG	MNT7.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-01	Y			
Falling from height	✓			Body Injury	4	1	4	1	LR	SG	MNT7.0.3	Reduction in loss of man days due to accident	N	N		WI-MNT-01, WI-MNT-38, WI-MNT-47, WI-MNT-55	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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wef: 25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-8																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of Fork Truck / Dumper																			
SUB ACTIVITY	SUB ACTIVITY No: 8.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, diesel, lubricants, bearings, rubber items, welding Machine and cutting sets, cotton																			
OUTPUT	Maintained Fork Truck / Dumper																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Pressing between two object	√			Body Injury	4	1	4	1	LR	SG	MNT8.0.1.	safe place to work	N	N		WI-MNT-67	Y			
Fire	√			Burn	5	1	5	2	LR	SG	MNT8.0.2.	safe place to work	N	N		WI-MNT-67	Y			
Awkward Posture	√			Sprain/twist/cramp	2	3	6	2		NS		safe place to work	N	N		WI-MNT-67	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

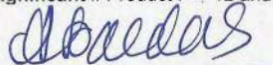
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-9																	
REV NO : 02																			
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																	
DEPARTMENT	Maintenance																		
ACTIVITY	Maintenance of gear boxes																		
SUB ACTIVITY		SUB ACTIVITY No: 9.0																	
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS	Tools and tackles, spares, diesel, lubricants, bearings, rubber items, welding Machine and cutting sets, cotton																		
OUTPUT	Maintained Gear Boxes																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O
Awkward Posture	✓			Sprain/twist/cramp	1	1	1	1	LR	NS		safe place to work	N	N		WI-MNT-23, WI-MNT-24, WI-MNT-25, WI-MNT-19, WI-MNT-44, WI-MNT-47, WI-MNT-01	Y		
Falling/slipping from height	✓			Body Injury	5	1	5	2	LR	SG	MNT9.0.1	safe place to work	N	N		WI-MNT-23, WI-MNT-24, WI-MNT-25, WI-MNT-19, WI-MNT-44, WI-MNT-47, WI-MNT-01, WI-MNT-08	Y		
Slippery Floor	✓			Body Injury	5	1	5	2	LR	SG	MNT9.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-23, WI-MNT-24, WI-MNT-25, WI-MNT-19, WI-MNT-44, WI-MNT-47, WI-MNT-01, WI-MNT-06	Y		
Fire	✓			Burn	5	1	5	2	LR	SG	MNT9.0.3	safe place to work	N	N		WI-MNT-23, WI-MNT-24, WI-MNT-25, WI-MNT-19, WI-MNT-44, WI-MNT-47, WI-MNT-01, WI-MNT-06	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LF/OR applicable


 Signature of Section in Charge

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 Signature of D-I

GID-MR-FH-002 R0
wef:26.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-MNT-HIRA-10																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of hydraulic system																			
SUB ACTIVITY	SUB ACTIVITY No: 10.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, diesel, lubricants, hydraulic Oil, rubber items, electrical power supply, cotton, jute																			
OUTPUT	Maintained hydraulic system																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Tripping on obstacle	√			Body Injury	2	2	4	1	LR	SG	MNT1 0.0.1	safe place to work	N	N		WI-MNT-27, WI-MNT-42, WI-MNT-54	Y			
Fire	√			Burn	5	1	5	2	LR	SG	MNT1 0.0.2	safe place to work	N	N		WI-MNT-27, WI-MNT-42, WI-MNT-54, WI-MNT-06	Y			
Slippery Floor	√			Body Injury	3	1	3	1	LR	SG	MNT1 0.0.3	Reduction in loss of man days due to accident	N	N		WI-MNT-27, WI-MNT-42, WI-MNT-54, WI-MNT-06	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

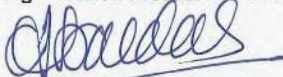
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DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024										No: GID-MNT-HIRA-11										
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Maintenance																		
ACTIVITY		MAINTENANCE OF ELECTRIC MOTORS														ACTIVITY No:11				
SUB ACTIVITY		SUB ACTIVITY No:11.0																		
JOB TYPE		ROUTINE/NON ROUTINE																		
INPUTS		TOOLS, TACKLES, SPARES, LUBRICANT, INSULATING MATERIAL, VARNISH, DIESEL, PETROL, SEALS, BEARING, MATERIAL HANDLING EQUIPMENT, COTTON, MEGGER, CLAMP METER LOTO KIT																		
OUTPUT		EFFECTIVE OPERATION OF MOTORS																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Hit by moving object	√			body injury	2	3	6	2		SG	MNT1 1.0.1	Accident free process	N	N		WI-MNT-68, GL-MNT-06, GL-MNT-08	Y			
Forceful movement	√			Sprain	2	3	6	2		NS		Safe place to work	N	N		WI-MNT-68, GL-MNT-06, GL-MNT-08	Y			
electrocution	√			trauma	5	1	5	2	LR	SG	MNT1 1.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-68, GL-MNT-06, GL-MNT-08	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge

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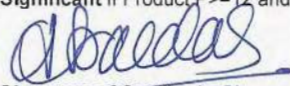

Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-MNT-HIRA-12																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	MAINTENANCE OF ELECTRIC TRANSFORMER															ACTIVITY No:12				
SUB ACTIVITY																SUB ACTIVITY No:12.0				
JOB TYPE	ROUTINE/NON ROUTINE																			
INPUTS	TOOLS, LOTO, TACKLES, SPARES, LUBRICANT, INSULATING MATERIAL, DIESEL, PETROL, GASKET, TRANSFORMER OIL, MATERIAL HANDLING EQUIPMENT, COTTON, MEGGER, BD VALUE CHECKING M/C ETC.																			
OUTPUT	MAINTAINED TRANSFORMER																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT1 2.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-04	Y			
Awkward Posture	v			pain/cramp	1	2	2	1		NS		safe place to work	N	N		WI-MNT-04	Y			
Contact with hot material	v			Burning	2	2	4	1	LR	SG	MNT1 2.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-04	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

CONTROLLED DOCUMENT
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 Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

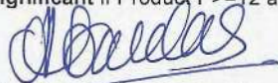
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DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Maintenance																		
ACTIVITY		MAINTENANCE OF RECTOFORMER														ACTIVITY No:13				
SUB ACTIVITY		SUB ACTIVITY No:13.0																		
JOB TYPE		ROUTINE/NON ROUTINE																		
INPUTS		TOOLS, TACKLES, SPARES, LUBRICANT, INSULATING MATERIAL, VARNISH, DIESEL, PETROL, SEALS, BEARING, MATERIAL HANDLING EQUIPMENT, COTTON, AIR BLOWER, MEGGER ETC.																		
OUTPUT		MAINTAINED OF RECTOFORMER																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Working in confined space	√			Breathing Problem	1	3	3	1		NS		safe place to work	N	N		WI-MNT-46	Y			
Contact with hot material	√			burn	1	2	2	1	LR	SG	MNT1 3.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-46	Y			
Awkward Posture	√			Sprain/twist/cramp	1	3	3	1		NS		safe place to work	N	N		WI-MNT-46	Y			
Electrocution	√			Trauma	3	1	3	1	LR	SG	MNT1 3.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-46	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
(If This Stamp is in Red)



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL																			
REV NO : 02																			
DATE : 10.11.2024		No: GID-MNT-HIRA-14																	
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Maintenance																		
ACTIVITY	Maintenance of cooling tower																		
SUB ACTIVITY	SUB ACTIVITY No: 14.0																		
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS	Tools and tackles, spares, lubricants, bearings, rubber items, diesel, welding Machine and cutting sets, cotton, electrical components, packing and sealing material																		
OUTPUT	Maintained Cooling Tower																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O
Fire	v			Burn	5	1	5	2	LR	SG	MNT14.0.1	safe place to work	N	N		WI-MNT-14, WI-MNT-74	Y		
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT14.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-14, WI-MNT-74	Y		
Falling/slipping from height	v			Body Injury	3	1	3	1	LR	SG	MNT14.0.3	safe place to work	N	N		WI-MNT-14, WI-MNT-74	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

CONTROLLED DOCUMENT
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 Signature of D-1

GID-MR-FH-002 R0
wef: 25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-MNT-HIRA-15																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	MAINTENANCE OF ELECTRONIC EQUIPMENT														ACTIVITY No:15					
SUB ACTIVITY															SUB ACTIVITY No:15.0					
JOB TYPE	ROUTINE/NON ROUTINE																			
INPUTS	TOOLS, SPARE, CLEANER, BRUSH, SOLDER IRON, LACKER SPRAY, COTTON, MULTI METER, SOLDER WIRE, LOTO																			
OUTPUT	MAINTAINED ELECTRONIC EQUIPMENTS																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Contact with hot material	v			Burn	1	3	3	1	LR	SG	MNT1 5.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-53, WI-MNT-48, WI-MNT-29	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT1 5.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-53, WI-MNT-48, WI-MNT-29	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

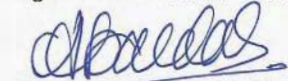
GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-16																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of air conditioner & water cooler																			
SUB ACTIVITY	SUB ACTIVITY No: 16.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, AC, Water Coolers, Consumables, Refrigerant gas, electricity, cotton, jute																			
OUTPUT	Maintained Air Conditioner and Water Cooler																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
Inhalation of fumes	v			Allergic reaction	2	1	2	1		NS		safe place to work	N	N		WI-MNT-69	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT16.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-69	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-MNT-HIRA-17																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of fans & Blowers																			
SUB ACTIVITY	SUB ACTIVITY No: 17.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, Bearings, spares, lubricants, packing and Sealing materials, rubber items, Lifting equipments, Cutting and welding sets, cotton, jute																			
OUTPUT	Maintained Fans and Blower																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Hit by moving objects	v			Body Injury	2	1	2	1	LR	SG	MNT17.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-45,WI-MNT-51,WI-MNT-17.	Y			
Falling/slipping from height	v			Body Injury	3	1	3	1	LR	SG	MNT17.0.2	safe place to work	N	N		WI-MNT-45,WI-MNT-51,WI-MNT-17.	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT17.0.3	safe place to work	N	N		WI-MNT-45,WI-MNT-51,WI-MNT-17.	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

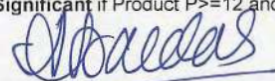
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 Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No:GID-MNT-HIRA-18																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	MAINTENANCE OF MCC/PCC/SWITCH YARD											ACTIVITY No:18								
SUB ACTIVITY												SUB ACTIVITY No:18.0								
JOB TYPE	ROUTINE/NON ROUTINE																			
INPUTS	LOTO, TOOLS, TACKLES, SPARES, LUBRICANT, INSULATING MATERIAL, MATERIAL HANDLING EQUIPMENT, COTTON, MEGGER, AIR BLOWER, TORCH, BRUSH, CLEANER, MULTI METER, ETC.																			
OUTPUT	MAINTAINED MCC/PCC/SWITCH YARD																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of dust	√			Breathing Problem	1	4	4	1		NS		Safe place to work	N	N		WI-MNT-30, WI-MNT-37, WI-MNT-66	Y			
Electrocution	√			Trauma	5	1	5	2	LR	SG	MNT1 8.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-30, WI-MNT-37, WI-MNT-66, WI-MNT-05	Y			
contact with hot material	√			Burn	1	3	3	1	LR	SG	MNT1 8.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-30, WI-MNT-37, WI-MNT-66, WI-MNT-05	Y			
Snake/ insect Bite	√			cut injury/poisoning	3	1	3	1	LR	SG	MNT1 8.0.3	Safe place to work	N	N		WI-MNT-66	Y			
Awkward Posture	√			Sprain/twist/cramp	1	4	4	1		NS		Safe place to work	N	N		WI-MNT-30, WI-MNT-37, WI-MNT-66	Y			
Fire	√			Burn	5	1	5	2	LR	SG	MNT1 8.0.4	safe place to work	N	N		WI-MNT-30, WI-MNT-37, WI-MNT-66, WI-MNT-05	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and L,R/OR applicable


 Signature of Section in Charge

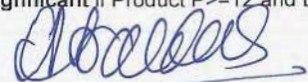
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 Signature of LHM

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL																			
REV NO : 02																			
DATE : 10.11.2024		No: GID-MNT-HIRA19																	
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Maintenance																		
ACTIVITY	Maintenance of Dust collector																		
SUB ACTIVITY	SUB ACTIVITY No: 19.0																		
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS	Tools and tackles, spares, rubber items, electricity, compressed Air, filter bags, cotton, jute																		
OUTPUT	Maintained Dust Collectors																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of dust	✓			Allergic reaction	3	1	3	1		NS		safe place to work	N	N		WI-MNT-17	Y		
Falling/slipping from height	✓			Body Injury	5	1	5	2		SG	MNT19.0.1	safe place to work	N	N		WI-MNT-17	Y		
Electrocution	✓			Trauma	5	1	5	2	LR	SG	MNT19.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-17	Y		
Fire	✓			Burn	5	1	5	2	LR	SG	MNT19.0.3	safe place to work	N	N		WI-MNT-17	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

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 Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

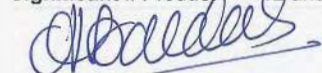
GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-20																		
REV NO : 02																				
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance/Operation of machining equipments																			
SUB ACTIVITY	SUB ACTIVITY No: 20.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, Bearings, spares, lubricants, rubber items, Diesel, Lifting equipments, Cutting and welding sets, cotton, jute																			
OUTPUT	Maintained machining equipments																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Hit by moving objects	v			Body injury	3	1	3	1	LR	SG	MNT2 0.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-11, WI-MNT-23, WI-MNT-24, WI-MNT-70	Y			
Tripping on obstacle	v			Body binjury	2	2	4	1	LR	SG	MNT2 0.0.2	safe place to work	N	N		WI-MNT-11, WI-MNT-23, WI-MNT-24, WI-MNT-70	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT2 0.0.3	safe place to work	N	N		WI-MNT-11, WI-MNT-23, WI-MNT-24, WI-MNT-70	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT2 0.0.4	Reduction in loss of man days due to accident	N	N		WI-MNT-11, WI-MNT-23, WI-MNT-24, WI-MNT-70	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
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Signature of Dt

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

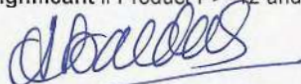
GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-MNT-HIRA-21										
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT					Maintenance															
ACTIVITY					MAINTENANCE OF HT/LT BREAKER										ACTIVITY No:21					
SUB ACTIVITY					ROUTINE/NON ROUTINE															
JOB TYPE					ROUTINE/NON ROUTINE															
INPUTS					TOOLS,TACKLES,SPARES,LUBRICANT,INSULATING MATERIAL, MATERIAL HANDELING EQUIPMENT,COTTON,MEGGER ,AIR BLOWER ,TORCH ,BRUSH,CLEANER,MULTI METER,LOTO KIT ETC															
OUTPUT					MAINTAINED OF HT & LT BREAKER															
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation dust	Y			Breathing Problem	1	4	4	1		NS		better upkeep of work place	N	N		WI-MNT-49	Y			
Electrocution	Y			Trauma	5	1	5	2	LR	SG	MNT2 1.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-49	Y			
Pressing between two object	Y			Body injury	2	1	2	1	LR	SG	MNT2 1.0.2	safe place to work	N	N		WI-MNT-49	Y			
Fire	Y			Burn	5	1	5	2	LR	SG	MNT2 1.0.3	safe place to work	N	N		WI-MNT-49	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

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 Signature of DH

GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-MNT-HIRA-22																
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Maintenance																		
ACTIVITY		Maintenance and operation of boiler																		
SUB ACTIVITY		SUB ACTIVITY No: 22.0																		
JOB TYPE		ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS		Tools and tackles, spares, lubricants, rubber items, Diesel, CBM gas, water, Lifting equipments, Packing & sealing material, Descaling compound, cotton, jute																		
OUTPUT		Maintained boiler																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXO
			Management Programme		Work Instruction															
Inhalation of fumes	v			Allergic reaction	3	1	3	1		NS		safe place to work	N	N		WI-MNT-08	Y			
Working in confined space	v			Breathing problem	2	2	4	1		NS		safe place to work	N	N		WI-MNT-08	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT2 2.0.1	safe place to work	N	N		WI-MNT-08	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT2 2.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-08	Y			
Caught in Explotion	v			Burn	5	1	5	2	LR	SG	MNT2 2.0.3	safe place to work	N	N		WI-MNT-08	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product R>=12 and LR/OR applicable


Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX															
DURGAPUR, WEST BENGAL																			
REV NO: 02				No:GID-MNT-HIRA-23															
DATE : 10.11.2024																			
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																			
DEPARTMENT	Maintenance																		
ACTIVITY	MAINTENANCE OF DCDB AND BATTERY BANK														ACTIVITY No:23				
SUB ACTIVITY	SUB ACTIVITY No:23.0																		
JOB TYPE	ROUTINE/NON ROUTINE																		
INPUTS	TOOLS,TACKLES,SPARES, ,INSULATING MATERIAL, ,COTTON, ,AIR BLOWER ,TORCH ,BRUSH,CLEANER,MULTI METER, LOTO KIT ETC.																		
OUTPUT	MAINTAINED BATTERY BANK																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of fumes/dust etc	v			Allergic reaction	2	2	4	1		NS		safe place to work	N	N		WI-MNT-15	Y		
Electrocution	v			Trauma	2	1	2	1	LR	SG	MNT2 3.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-15	Y		
Contact with skin	v			Burning/skin irritation/eye irritation	2	2	4	1	LR	SG	MNT2 3.0.2	safe place to work	N	N		WI-MNT-15	Y		
Fire	v			Burn	5	1	5	2	LR	SG	MNT2 3.0.3	safe place to work	N	N		WI-MNT-15	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


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GID-MR-FH-002 R0
wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

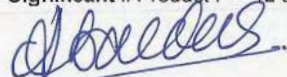
GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																			
DURGAPUR, WEST BENGAL																													
REV NO : 02																				No: GID-MNT-HIRA-24									
DATE : 10.11.2024																													
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																													
DEPARTMENT		Maintenance																											
ACTIVITY		Maintenance of Thermopac																											
SUB ACTIVITY		SUB ACTIVITY No: 24.0																											
JOB TYPE		ROUTINE/NON ROUTINE: ROUTINE																											
INPUTS		Tools and tackles, spares, lubricants, rubber items, Packing & sealing material, CBM gas, Descaling compound, cotton, jute																											
OUTPUT		Maintained Thermopac																											
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE											
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO									
															Management Programme	Work Instruction													
Inhalation of fumes	v			Allergic reaction	3	1	3	1		NS		safe place to work	N	N		WI-MNT-52	Y												
Tripping on obstacle	v			Body Injury	2	2	4	1	LR	SG	MNT2 4.0.1	safe place to work	N	N		WI-MNT-52	Y												
Fire	v			Burn	5	1	5	2	LR	SG	MNT2 4.0.2	safe place to work	N	N		WI-MNT-52	Y												
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT2 4.0.3	Reduction in loss of man days due to accident	N	N		WI-MNT-52	Y												

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

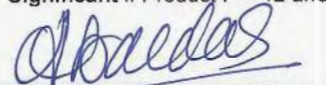
GRAPHITE INDIA LIMITED										HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX										
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT					Maintenance															
ACTIVITY					Maintenance of Hydraulic and Pneumatic Cylinder															
SUB ACTIVITY					SUB ACTIVITY No: 25.0															
JOB TYPE					ROUTINE/NON ROUTINE: ROUTINE															
INPUTS					Tools and tackles, spares, lubricants, hydraulic oil, Air, rubber items, Packing & sealing material, diesel, cotton, jute, material handling equipments															
OUTPUT					Maintained Hydraulic and Pneumatic Cylinder															
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
			Management Programme		Work Instruction															
Slippery Floor	v			Body Injury	5	1	5	2	LR	SG	MNT25.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-42, WI-MNT-27, WI-MNT-50, WI-MNT-06	Y			
Hit by moving objects	v			Body Injury	3	1	3	1	LR	SG	MNT25.0.2	Reduction in loss of man days due to accident	N	N		WI-MNT-42, WI-MNT-27, WI-MNT-50	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT25.0.3	safe place to work	N	N		WI-MNT-42, WI-MNT-27, WI-MNT-50, WI-MNT-06	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-26																		
REV NO : 02		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DATE : 10.11.2024																				
DEPARTMENT	Maintenance																			
ACTIVITY	Welding, Gas Cutting, Soldering and Brazing Processes																			
SUB ACTIVITY		SUB ACTIVITY No: 26.0																		
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, Welding electrodes, Fluxes, Electricity, DA Gas, Oxygen Gas, cotton, jute																			
OUTPUT	Proper material joining, cutting and build up processes																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SH/No	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Contact with Hot material	v			Burn	2	3	6	2	LR	SG	MNT26.0.1	safe place to work	N	N		GL-MNT-09, WI-MNT-01,08,10,16,17,19,20,26,27,28,31,32,33,35,39,40,44,45,42,47,51,52,55,57,61,63,64,65,67,79,06	Y			
Inhalation of fumes	v			Breathing problem	2	3	6	2		NS		safe place to work	N	N		GL-MNT-09, WI-MNT-01,08,10,16,17,19,20,26,27,28,31,32,33,35,39,40,44,45,42,47,51,52,55,57,61,63,64,65,67,79,06	Y			
Working in confined space	v			Breathing problem	2	2	4	1		NS		safe place to work	N	N		GL-MNT-09, WI-MNT-01,08,10,16,17,19,20,26,27,28,31,32,33,35,39,40,44,45,42,47,51,52,55,57,61,63,64,65,67,79,06	Y			
Electrocution	v			Trauma	5	1	5	2	LR	SG	MNT26.0.2	Reduction in loss of man days due to accident	N	N		GL-MNT-09, WI-MNT-01,08,10,16,17,19,20,26,27,28,31,32,33,35,39,40,44,45,42,47,51,52,55,57,61,63,64,65,67,79,06	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT26.0.3	safe place to work	N	N		GL-MNT-09, WI-MNT-01,08,10,16,17,19,20,26,27,28,31,32,33,35,39,40,44,45,42,47,51,52,55,57,61,63,64,65,67,79,06	Y			

Evaluation : (S) = Severity, (O) = Occurrence, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P=12 and LR/OR applicable

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 Signature of Section in Charge

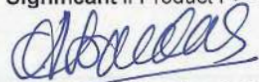
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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-27																	
REV NO : 02																			
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																	
DEPARTMENT	Maintenance																		
ACTIVITY	Maintenance of CBM Gas lines																		
SUB ACTIVITY	SUB ACTIVITY No: 27.0																		
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS	Tools and tackles, Spares, Gas Cutting & Welding sets, Packing & Sealing materials, welding electrodes, flux, cotton, jute																		
OUTPUT	Leak proof CBM gas lines																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of fumes	v			Breathing problem	2	1	2	1		NS		safe place to work	N	N		WI-MNT-08,09,26,52,63,64	Y		
Caught in Explotion	v			Burn	5	1	5	2	LR	SG	MNT2 7.0.1	safe place to work	N	N		WI-MNT-08,09,26,52,63,64	Y		
Fire	v			Burn	5	1	5	2	LR	SG	MNT2 7.0.2	safe place to work	N	N		WI-MNT-08,09,26,52,63,64	Y		

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

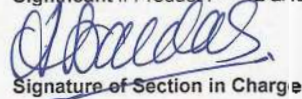
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DURGAPUR, WEST BENGAL																				
REV NO : 02		No: GID-MNT-HIRA-28																		
DATE : 10.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																		
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of Crane Mounted Milling																			
SUB ACTIVITY		SUB ACTIVITY No: 28.0																		
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, Welding electrodes, Fluxes, Electricity, DA Gas, Oxygen Gas, cotton, jute																			
OUTPUT	Maintained Crane Mounted Milling																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Inhalation of fumes	✓			Breathing problem	2	4	8	2		NS		safe place to work	N	N		WI-MNT-16, WI-MNT-35, WI-MNT-79	Y			
Working in confined space	✓			Breathing problem	2	2	4	1		NS		safe place to work	N	N		WI-MNT-16, WI-MNT-35, WI-MNT-79	Y			
Falling/slipping from height	✓			Body Injury	5	1	5	2	LR	SG	MNT28.0.1	safe place to work	N	N		WI-MNT-16, WI-MNT-35, WI-MNT-79	Y			
Fire	✓			Burn	5	1	5	2	LR	SG	MNT28.0.2	safe place to work	N	N		WI-MNT-16, WI-MNT-35, WI-MNT-79	Y			
Working in noise prone Area	✓			Interference of communication	1	4	4	1	LR	SG	MNT28.0.3	safe place to work	N	N		WI-MNT-16, WI-MNT-35, WI-MNT-79	Y			
Electrocution	✓			Trauma	5	1	5	2	LR	SG	MNT28.0.4	Reduction in loss of man days due to accident	N	N		WI-MNT-16, WI-MNT-35, WI-MNT-79	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024		No: GID-MNT-HIRA-29																		
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of FO and Diesel storage tanks																			
SUB ACTIVITY	SUB ACTIVITY No: 29.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackies, Rubber Items, Diesel, FO, Packing & Sealing material, Gas cutting & welding set, cotton, jute																			
OUTPUT	Maintained Leak proof & safe FO & Diesel storage Tank																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SxO
Falling/slipping from height	√			Body Injury	3	1	3	1	LR	SG	MNT29.0.1	safe place to work	N	N		WI-MNT-02,08,09,26,52,63,64,67	Y			
Fire	√			Burn	5	1	5	2	LR	SG	MNT29.0.2	safe place to work	N	N		WI-MNT-02,08,09,26,52,63,64,67	Y			
Caught in Explotion	√			Burn	5	1	5	2	LR	SG	MNT29.0.3	safe place to work	N	N		WI-MNT-02,08,09,26,52,63,64,67	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED					HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX															
DURGAPUR, WEST BENGAL																				
REV NO : 02					No:MNT-HIRA-30															
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Maintenance																		
ACTIVITY		IMPLEMENTATION OF 'LOCKOUT TAG OUT(LOTO) PRACTICE																	ACTIVITY No:30	
SUB ACTIVITY		SUB ACTIVITY No:30.0																		
JOB TYPE		ROUTINE/NON ROUTINE																		
INPUTS		STATIONARY DOCUMENTS LOCK AND KEY																		
OUTPUT		SAFE WORKING ENVIRONMENT																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Electrocution	√			Trauma	3	1	3	1	LR	SG	MNT3 0.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-71	Y			
Pressing between two object	√			Body injury	1	3	3	1	LR	SG	MNT3 0.0.2	safe place to work	N	N		WI-MNT-71	Y			
Inhalation of fumes	√			Breathing problem	1	3	3	1		NS		safe place to work	N	N		WI-MNT-71	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

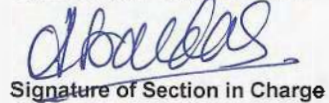
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DURGAPUR, WEST BENGAL																				
REV NO : 02		No: GID-MNT-HIRA-31																		
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of vacuum pumps																			
SUB ACTIVITY	SUB ACTIVITY No: 31.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, Rubber Items, lubricants packing and sealing material, diesel, Gas cutting set, cotton jute																			
OUTPUT	Well maintained Vacuum pump																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Contact with skin	v			skin irritation/eye irritation	2	2	4	1		NS		safe place to work	N	N		WI-MNT-54	Y			
Slippery Floor	v			Body Injury	3	1	3	1	LR	SG	MNT31.0.1	Reduction in loss of man days due to accident	N	N		WI-MNT-54	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT31.0.2	safe place to work	N	N		WI-MNT-54	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

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Significant if Product P>=12 and LR/OR applicable



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wef:25.08.2022

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL		No: GID-MNT-HIRA-32																		
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	Maintenance																			
ACTIVITY	Maintenance of pitch pumps																			
SUB ACTIVITY	SUB ACTIVITY No: 32.0																			
JOB TYPE	ROUTINE/NON ROUTINE: ROUTINE																			
INPUTS	Tools and tackles, spares, Rubber Items, lubricants packing and sealing material, diesel, Gas cutting set, cotton jute																			
OUTPUT	Well maintained pitch pump																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control (Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXC
Inhalation of fumes	√			Breathing problem	2	2	4	1		NS		safe place to work	N	N		WI-MNT-59 ,WI-MNT-72, WI-MNT-06	Y			
Contact with skin	√			Burning/skin irritation/eye irritation	2	2	4	1	LR	SG	MNT32.0.1	safe place to work	N	N		WI-MNT-59 ,WI-MNT-72, WI-MNT-06	Y			
Fire	√			Burn	5	1	5	2	LR	SG	MNT32.0.2	safe place to work	N	N		WI-MNT-59 ,WI-MNT-72, WI-MNT-06	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

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HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

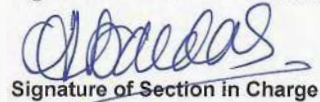
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DURGAPUR, WEST BENGAL																				
REV NO : 02																				
DATE : 10.11.2024										No: GID-MNT-HIRA-33										
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		Maintenance																		
ACTIVITY		Maintenance of Waste Oil Room																		
SUB ACTIVITY		SUB ACTIVITY No. 33.0																		
JOB TYPE		ROUTINE/NON ROUTINE: ROUTINE																		
INPUTS		Tools and tackles, spares, and sealing material, cotton cloth, Loto ,etc																		
OUTPUT		Well maintained pitch pump																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control (Y/N)	Administrative Control (Y/N)	PPE (Y/N)	S	O	P=SXC
Slippery Floor	v			Body injury	3	2	6	2	LR	SG	MNT33.0.1	safe place to work	N	N		WI-MNT-09 ,GL-MNT-13	Y			
Pressing between two object	v			Body injury	2	2	4	1	LR	SG	MNT33.0.2	safe place to work	N	N		WI-MNT-09 ,GL-MNT-13	Y			
Fire	v			Burn	5	1	5	2	LR	SG	MNT33.0.3	safe place to work	N	N		WI-MNT-09 ,GL-MNT-13	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
(If This Stamp is in Red)



Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	
No: GID-RMSM-HIRA-1.1	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK	
DEPARTMENT	RMSM
ACTIVITY	De-stuffing of container bagging and stacking or feeding to silo at plant ACTIVITY No: 1
SUB ACTIVITY	De-stuffing of container bagging, stacking and storage at plant SUB ACTIVITY No: 1.1
JOB TYPE	ROUTINE / NON-ROUTINE
INPUTS	Trailer, Container, CPC, Truck, Hydra, HDPE Jumbo/Small Bag, Tarपालene.
OUTPUT	Stacked bags

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust (Not measurable)	X	-	-	Breathing Problem	1	3	3	1	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	3	3
Contact with skin	X	-	-	Allergy, Eye irritation	1	3	3	1	-	-	-	Belter upkeep of work place and machineries	N	N	N	-	Y	1	3	3
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-1.1.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-01	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

R.K. Vithaldas

Signature of Section in Charge

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[Handwritten Signature]

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL				No: GID-RMSM-HIRA-1.2																
REV NO : 02																				
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT		RMSM																		
ACTIVITY		De-stuffing of container bagging and stacking or feeding to silo at plant														ACTIVITY No: 1				
SUB ACTIVITY		De-stuffing of container feeding to Silos.														SUB ACTIVITY No: 1.2				
JOB TYPE		ROUTINE / NON-ROUTINE																		
INPUTS		Trailer, Container, CPC, Truck, Hydra, HDPE Jumbo/Small Bag, Machines, Electricity.																		
OUTPUT		Stored in Silos.																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust (Not measurable)	X	-	-	Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X	-	-	Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-1.2.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-01	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																		
DURGAPUR, WEST BENGAL																				
REV NO : 02		No: GID-RSM-HIRA-2.1																		
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	RMSM																			
ACTIVITY	Unloading of CPC-GG, Alu(RH) and Alu(LWG) from Truck or Trailer															ACTIVITY No: 2				
SUB ACTIVITY	Stacking of CPC-GG, Alu(RH) and Alu(LWG) in Jumbo bags															SUB ACTIVITY No: 2.1				
JOB TYPE	ROUTINE /NON ROUTINE																			
INPUTS	Truck, Trailer, CPC-CPC-GG and Alu, Hydra, HDPE Jumbo Bag, Tarपालene.																			
OUTPUT	Stacked bags.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	-	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	-	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-2.1.1	Safe Place to Work Better upkeep of work place and machineries	N	N	-	WI-RMSM-02	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal, A=Abnormal, E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

CONTROLLED DOCUMENT
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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-RMSM-HIRA-2.2
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	RMSM	ACTIVITY No: 2
ACTIVITY	Unloading of CPC-GG, Alu(RH) and Alu(LWG) from Truck or Tractor	
SUB ACTIVITY	Feeding of CPC-GG, Alu(RH) and Alu(LWG) in Jumbo bags	SUB ACTIVITY No: 2.2
JOB TYPE	ROUTINE /NON-ROUTINE	
INPUTS	Truck, Tractor, CPC, Hydra, HDPE Jumbo Bag, Machine, Electricity	
OUTPUT	Stored in Sites.	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-2.2.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-02	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

R.K. Vithalram

Signature of Section in Charge

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[Signature]

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-RSM-HIRA-2.3
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	RMSM	ACTIVITY No: 2
ACTIVITY	Unloading of CPC-GG, Alu(RH) and Alu(LWG) from Truck or Tractor	SUB ACTIVITY No: 2.3
SUB ACTIVITY	Stacking of CPC-GG, Alu(RH) and Alu(LWG) (Small bags/50kgs)	
JOB TYPE	ROUTINE /NON-ROUTINE	
INPUTS	Truck, Tractor, CPC, HDPE small Bag, Tarpaulene.	
OUTPUT	Stacked bags.	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

Tarika. V. ...

Signature of Section in Charge

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[Signature]

Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-RSM-HIRA-3.0
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK	
DEPARTMENT	RMSM
ACTIVITY	Unloading and stacking of Solid Pitch (Binder and Imp) from Truck or Tractor ACTIVITY No: 3
SUB ACTIVITY	SUB ACTIVITY No:
JOB TYPE	ROUTINE /NON-ROUTINE
INPUTS	Truck, Tractor, CPC, Hydra, HDPE Bag, Tarpaulene.
OUTPUT	Stacked bags.

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
	Management Programme		Work Instruction																	
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-3.0.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-06	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge

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 Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																
DURGAPUR, WEST BENGAL																				
REV NO : 02				No: GID-RSM-HIRA-4.0																
DATE : 10.11.2024																				
IDENTIFICATION & EVALUATION OF HAZARDS & RISK																				
DEPARTMENT	RMSM																			
ACTIVITY	Bagging and stacking of returned CPC particles from outside tank.														ACTIVITY No: 4					
SUB ACTIVITY															SUB ACTIVITY No:					
JOB TYPE	ROUTINE / NON-ROUTINE																			
INPUTS	CPC, Hydra, HDPE Jumbo/Small bags, Machines, Electricity, Tarपालena,																			
OUTPUT	Stacked CPC in bags.																			
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control Management Programme	Administrative Control(Y/N) Work Instruction	PPE (Y/N)	S	O	P=SXO
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-4.0.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-01	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

R. K. Vishwakarma

Signature of Section in Charge

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[Signature]
Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-RMSM-HIRA-5.0
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	RMSM	ACTIVITY No: 5
ACTIVITY	Iron oxide, Stearic Acid and chromium oxide unloading and stacking.	SUB ACTIVITY No:
SUB ACTIVITY		
JOB TYPE	ROUTINE / NON-ROUTINE	
INPUTS	Truck, Iron oxide/Stearic Acid/chromium oxide, Machine, Electricity	
OUTPUT	Stacked bags.	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-RMSM-HIRA-6.0
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK	
DEPARTMENT	RMSM
ACTIVITY	Breeze coke, Silica Sand and saw dust unloading and storing
SUB ACTIVITY	
JOB TYPE	ROUTINE / NON-ROUTINE
INPUTS	Truck, Breeze coke, Silica Sand, saw dust, Hydra.
OUTPUT	Stacked bags.

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Inhalation of dust (Not measurable)	X			Breathing Problem	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Contact with skin	X			Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-6.0.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-05	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable



Signature of Section in Charge

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Signature of DH

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX No: GID-RMSM-HIRA-7.0
DURGAPUR, WEST BENGAL	
REV NO : 02	
DATE : 10.11.2024	

IDENTIFICATION & EVALUATION OF HAZARDS & RISK

DEPARTMENT	RMSM	ACTIVITY No: 7
ACTIVITY	Extrusion oil, LDO, LSHS and Furnace oil unloading and storing	SUB ACTIVITY No:
SUB ACTIVITY		
JOB TYPE	ROUTINE / NON-ROUTINE	
INPUTS	Truck/Tanker, Extrusion oil, LDO, LSHS and Furnace oil, Machine, Electricity	
OUTPUT	Stored in tanks	

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan					RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXO
															Management Programme	Work Instruction				
Contact with skin	X	-	-	Allergy, Eye irritation	1	5	5	2	-	-	-	Better upkeep of work place and machineries	N	N	N	-	Y	1	5	5
Falling/ slipping from height	X	-	-	Body Injury	3	1	3	1	LR	SG	RMSM-7.0.1	Safe Place to Work Better upkeep of work place and machineries	N	N	N	WI-RMSM-07	Y	3	1	3

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
Significant if Product P>=12 and LR/OR applicable

Rik. Vikram

Signature of Section in Charge

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[Signature]
Signature of DH

GID-MR-F02
R4 WEF 01.03.2016

GRAPHITE INDIA LIMITED, DURGAPUR
DOCUMENT CHANGE REQUEST

DCR No. OHS-7.5

1. Document to Change(L1-AQSM / L2-QSPM / L3) :L3

1.1 Department Name : Safety

1.2 Change Proposed by & Dt : Pradip Roy Pratihar

DT. 29.11.2024

2. Document Revision Details:

Sr No.	Procedure no/ Document No.	Procedure / Document Title	Page No.	Current Issue No.	Current Revision No. & Date
1	GID-SAF-HIRA-01	Availability & Storage of Fire Extinguisher	1 of 1	00	01 11.11.2023
2	GID-SAF-HIRA-02	Maintainance of Fire Extinguisher, Fire Hydrant line	1 of 1	00	01 11.11.2023
3	GID-SAF-HIRA-03	Training on the Fire Fighting/Mock drill	1 of 1	00	01 11.11.2023

3. Change proposed:

Yearly revision.

4. Reason for change:

Yearly revision

5. Proposer's Sign

: 6. Applicable for L3 Documents:

6.1 Change in L3 document REQUIRE / DOES NOT REQUIRE any change in L-2 document.

6.1.1 If L2 require Change, Procedure No.

: N.A.

6.1.2 Processed L2 DCR No.

: N.A.

6.2 Approved by Dept. Head (Name):

: Sudev Mohanta

6.2.1 Signature of DH

: 

6.3 Revision effective from dt

: 29.11.2024

7. Applicable for L1 / L2 Documents

Recommended/Approved by Plant Head

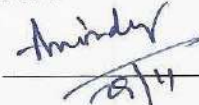
: N.A.

8. Applicable for L1 Documents

Approved by ED

: N.A.

9. MR's Sign. & Date

: 

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GID-MR-FH-002 R0
wef:25.08.2022

GRAPHITE INDIA LIMITED		HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX																	
DURGAPUR, WEST BENGAL		No. GID-SAF-HIRA-01																	
REV NO: 02																			
29.11.2024		IDENTIFICATION & EVALUATION OF HAZARDS & RISK																	
DEPARTMENT	Safety																		
ACTIVITY	Preparing for Fire Emergency																		
SUB ACTIVITY	Availability & Storage of Fire Extinguisher																		
JOB TYPE	NON ROUTINE																		
INPUTS	Fire extinguisher, Storage Area, History card & Service Record																		
OUTPUT	Stored Fire extinguisher at strategic location																		
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SH/No	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXO	D					Elimination (Y/N)	Substitution (Y/N)	Engineering Control	Administrative Control (Y/N)	PPE (Y/N)	S	O
Fall of material	N			Body Injury	5	2	10	2	NA	NS	NA	Risk free operation	N	N	N	WI-SAF-02	Y		
Caught in Explosion	N			Body Injury, Burn	4	2	8	2	NA	NS	NA	Risk free operation	N	N	N	N	Y		

Evaluation : [S] = Severity, [O] = Occurance, [D] = Detection
 Situation type: N=Normal, A=Abnormal, E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable

Signature of Section in Charge


Signature of DH

CONTROLLED DOCUMENT
(If this Stamp is in red)

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX


GRAPHITE INDIA LIMITED				HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX															
DURGAPUR, WEST BENGAL				No. GID-SAF-HIRA-03															
REV NO :02																			
29.11.2024				IDENTIFICATION & EVALUATION OF HAZARDS & RISK															
DEPARTMENT		Safety																	
ACTIVITY		Training and mock drill to meet emergency																	
SUB ACTIVITY		Training on the Fire Fighting/Mock drill																	
JOB TYPE		NON ROUTINE																	
INPUTS		Participant, Controller, Mock drill schedule, wood, water, Fire Extinguisher																	
OUTPUT		Trained work force																	
HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE		
	N	A	E		S	O	P=SXC	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SXC
slip/ trip /fall	N			Body Injury	4	2	8	2	NA	NS	NA	Risk free operation	N	N	N	WI-SAF-03	Y		
Inhalation of fumes/dust etc	N			Breathing Problem, Allergic reaction	4	2	8	2	NA	NS	NA	Risk free operation	N	N	N	WI-SAF-03	Y		


Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection

Situation type: N=Normal,A=Abnormal,E=Emergency

LR/OR= Legal and other requirement

Significant if Product P>=12 and LR/OR applicable


Signature of Section in Charge


Signature of DH

CONTROLLED DOCUMENT
(If this Stamp is in red)

HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX

GRAPHITE INDIA LIMITED	HAZARD IDENTIFICATION AND RISK ASSESSMENT MATRIX
DURGAPUR, WEST BENGAL	
REV NO :02	
29.11.2024	No: GID-SAF-HIRA-02
IDENTIFICATION & EVALUATION OF HAZARDS & RISK	

DEPARTMENT	Safety
ACTIVITY	Maintainance of Fire Fighting Equipment
SUB ACTIVITY	Maintainance of Fire Extinguisher , Fire Hydrant line
JOB TYPE	Non Routine
INPUTS	Fire Extinguisher, Water , Fire Hydrant , Fire Pump , Electricity
OUTPUT	Maintainance of Fire Extinguisher and Fire Hydrant line

HAZARDS/CONCERN	SITUATION TYPE			RISK	EVALUATION				LR/OR	SG/NS	SHNo	Opportunity	Mitigation Plan				RESIDUAL SCORE			
	N	A	E		S	O	P=SxO	D					Elimination (Y/N)	Substitution (Y/N)	Engineered Control	Administrative Control(Y/N)	PPE (Y/N)	S	O	P=SxO
															Management Programme	Work Instruction				
Inhalation of Dust /Fumes	N			Breathing Problem	4	2	8	2	NA	NS	NA	Risk free operation	N	N	N	WI-SAF-02	Y			
Contact with skin	N			Skin irritation	4	1	4	1	NA	NS	NA	Risk free operation	N	N	N	N	Y			
falling object	N			Body injury	5	2	10	2	NA	NS	NA	Risk free operation	N	N	N	WI-SAF-03	Y			
Electrocution	N			Burn	5	2	10	2	NA	NS	NA	Risk free operation	N	N	N	N	Y			
Awkward posture	N			Sprain/twist/cramp	4	1	4	1	NA	NS	NA	Risk free operation	N	N	N	N	Y			

Evaluation : (S) = Severity, (O) = Occurance, (D) = Detection
 Situation type: N=Normal,A=Abnormal,E=Emergency
 LR/OR= Legal and other requirement
 Significant if Product P>=12 and LR/OR applicable


 Signature of Section in Charge


 Signature of DH

CONTROLLED DOCUMENT
 (If this Stamp is in red)

TITLE: ON-SITE EMERGENCY PLAN

REFERENCE : GID-ESPM-PRE10

GRAPHITE INDIA LTD

SAGARBHANGA

DUGAPUR-713211



ON SITE EMERGENCY PLAN

(Prepared As Per Sec 41(B) of Factories Act-1948 and Rule -13 of
Manufacture, Storage and Import of Hazardous Chemical Rules 1989)

Introduced in December, 2013

Latest Revision in April, 2025

R7

Prepared By

Safety Officer (Durgapur Plant)

Approved By

Plant Head

COMPANY PROFILE

Name of the plant	GRAPHITE INDIA LTD
Product	Manufacturing of Graphite Electrode
Location	SagarBhanga, Durgapur-11, Dist- Burdwan
Mailing address	SagarBhanga, Durgapur-11, Dist- Burdwan
Office phone no	9732024166/9332022477
Capacity	52000 MTPA
Plant Commissioning	Started in the year 1967
Total present work force	Around 2000

OVERVIEW

Graphite India Ltd., as the name suggests, is the pioneer in Carbon and Graphite products in India ever since it came into existence way back in 1960s. Starting with Electrodes, the core product of the company, it gradually extended its focus into research and development and entered into the coveted arena of Specialty carbon and graphite applications.

It then added the Heat Exchanger Equipments and Glass Reinforced Pipes (GRP) in the product portfolio. Today, it has a strong global presence and is among the top few companies with respect to capacity, customer bondage and an impeccable service record.

The corporate philosophy of the company lays accent on the ethos of quality across all its functions which has culminated to an enviable track record of product and service alike. The Company is ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018 accredited and follows the eco-friendly processes.

We also have a team of dedicated professionals who are passionate about the Carbon and Graphite technology and also the application specialists whose treasure of experience in a variety of furnaces round the world is a distinct advantage for the users. There is a customer orientation in our operational procedures and services which has helped Graphite India to carve out a niche in the competitive milieu round the world.

ABOUT THE PLANT:**Location**

Graphite India Limited was set up in 1967. The plant is located at Sagarbhanga, Durgapur-713211 which is approximately 2 Km from Durgapur Railway Station. The plant area is approx 55 Acres.

One new Extrusion unit has come up 20 meters away from Old Plant. It was started in October,2013. Old plant is used for the production of small diameter graphite electrode and new plant for larger diameter. Plant is ISO 9001:2015, ISO 14001:2015 & ISO45001:2018.

Factory runs in 3 shifts plus one general shift. No. of employees there are around 1500. Metal road is present inside the plant to access different units.

1 Old Extrusion & 1 New Extrusion, 5 Reid Hammer furnaces, 2 Tunnel kiln, 1Recirculation Furnaces for Baking process, 3 P.I. operation and 3 LWG Furnaces, Finishing & Shipping.

1 Acheson Furnace are there for graphitization process. Reid hammer furnaces and Tunnel kiln furnace are CBM/FO fired. LWG & Acheson Furnaces are electrically fired. CBM is supplied by M/s ESSAR.

Surrounding Exposure:

North: Sagarbhanga Colony

South: Neighbouring Factories

East: Vacant land

West: SRMB Srijan Factory

River Damodar is at a distance of 5 km from plant.

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LIST OF ANNEXURES

- A. Brief description of the manufacturing process
- B. Telephone numbers of Police, Fire Brigade, Hospitals & other outside Emergency Services
- C. Telephone numbers & addresses of Key Personnel
- D. Material Safety Data Sheets
- E. Information on Fire Fighting System
- F. List of PPEs at EPR Centre
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- H. First Aid and Medical Facilities.
- I. Process flow chart.
- J. Lay out of plant showing Fire fighting installation.
- K. Emergency organization chart.
- L. List of Fire Extinguishers with location.
- M. Fire Fighter List.
- N. Permit to Work System.
- O. Eye wash fountain Location.
- P. First Aiders Name.
- Q. Work place Hygiene
- R. Communicable Disease & Prevention

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CHAPTER 1

PREFACE

- 1.1** The enclosed On-site Emergency Plan is made for the Electrode Manufacturing Plant of **M/s GRAPHITE INDIA LTD, SAGARBHANGA, DURGAPUR-11.**
- 1.2** The plant has a facility to produce **ELECTRODE** by using Calcined Petroleum Coke, Binder Pitch (Solid/Liquid) as main raw material along with additive Extrusion Oil..
- Breeze Coke, Silica Sand, Saw Dust and Calcined Petroleum coke (RH Grade), Low Ash Met Coke etc is used Pack media during the Electrode manufacturing process.
- Additive like Chromium Oxide, Iron Oxide, Stearic Acid, Extrusion Oil, Breeze Coke, Silica Sand, Saw Dust and Low Ash Met Coke etc is used.
- 1.3** The plant is designed and equipped to handle hazardous materials and to carry out various processes and operations on these chemicals. The plant is provided with Fire Hydrant system, Fire extinguishers. In addition to this adequate types and number of Personal Protective Equipments, First Aid Boxes, Eye washers, Ventilation system has been provided.
- 1.4** Considering the types of operations carried out in the plant and the nature & extent of hazards present therein, the Management of **M/s GRAPHITE INDIA LTD** deems it necessary to have some system of tackling an emergency.
- 1.5** The formulation of this document is an outcome of the above thought process.

CHAPTER 2

PREAMBLE

In spite of various preventive and precautionary measures taken in the plant, the possibility of a mishap cannot be totally ruled out. Hence, the need to prepare a Contingency Plan for dealing with incidences which may still occur and are likely to affect LIFE **and** / or PROPERTY, both within the plant and in the immediate neighborhood.

Such an emergency could be the result from the malfunction of the Plant & Equipments or non-observance of operating instructions. It could, at times, be the consequences of acts outside the control of Plant Management like severe storm, earthquake, flooding, or deliberate acts of arson or sabotage.

A Major Emergency in the plant is one that may cause serious injury or loss of life and damage to the property.

This On Site Emergency Plan (OEP) explains the code of conduct of all personnel in the plant along with the actions to be carried out in case of an Emergency. This plan gives the guidelines for employees, contractors, transporters, etc. It not only defines responsibilities but also informs about prompt rescue operations, evacuations, rehabilitation, co-ordination and communication.

1. EMERGENCY:

An Emergency is a situation, which may lead to or cause large-scale damage or destruction of life, property or environment within or out side the Factory. Such an unexpected situation may be too difficult to handle for the normal work force within the plant.

2. NATURE OF EMERGENCY:

The emergency specified in the OEP refers to occurrence of one or more of the following events: -

- a. **Fire/Explosion.**
- b. **Major accident such as structural or building collapse, overturning of road tanker containing flammable substances.**
- c. **Natural calamities like storm, flood, earthquake, etc.,**
- d. **Sabotage act of terrorism, civil commotion, air raid etc.**
- e. **Communicable Disease.**

3. PROCESS DESCRIPTION:

A brief description of the Manufacturing Process is given in 'Annexure A'. Different Units-

a) Extrusion (Old and New)

b) Baking (RC & Ried-Hammer), Pitch Impregnation and Tunnel Kiln.

c) Graphitization (Acheson and LWG)

d) Inspection

e) Finishing and shipping.

4. RAW MATERIAS HANDLED IN BULK.

Sr.No.	Material	Capacity	Remarks
1	Furnace Oil	2 X 70KL /1 X25 KL	Stored in MS Tank
2	Extrusion Oil	1X 18KL & 1x 5KL	Stored In MS Tank
3	CPC	8000MT	Stored in open and Shed
4	Binder Pitch(solid)	100MT	Stored in shed.
5	Binder Pitch(Liquid)	3 X 90 KL	Stored In MS Tank
6	Impregnating Pitch (Solid)	300 MT	Stored in Shed
7	Impregnation Pitch (Liquid).	3 X 58.2 KL	Stored In MS Tank
8	LPG cylinder	120 cylinder-46kg Each	Stored in shed
9	Coal bed Methane (CBM)	47500 scm (consumption per Day)	Stored in Silo.
10	Low Ash Met Coke (LAMC)	700 MT	

5. IDENTIFICATION OF HAZARDOUS AREAS:

HAZARD	AREA	PROBABLE CAUSE OF THE ACCIDENT	EXPOSURE
Explosion	Boilers / Transformers / Receivers for the Air compressors/Furnace area.	Malfunctioning of the Safety Valve/High heat generation.	Low
Flammable Petroleum Product Storage Tank / Drum Storage area/ETP	External fire causing pressure built up in the tanks / barrels		Moderate
Fire	LS.D. / FO Storage Area	Flammable vapor / air mixture and source of ignition.	Moderate
Flammable Petroleum Product Storage Tank / Drum Storage Shed /Production Area		Formation on pool in the dyke wall and source of ignition.	
External fire <input type="checkbox"/> Built up of internal pressure <input type="checkbox"/> Failure of the top cover <input type="checkbox"/> Tank on Fire			
Spillage	Acid / Alkali Storage Area	Spillage of Acid / Alkali due to rupture of the pipe line, collapse of the storage tank	Low

6. OTHER HAZARDS. SR NO.

SR NO.	TYPE	EXPOSURE
1	RIOTS	Not a riot prone zone. Exposure Low
2	STRIKE	No past record. Exposure Moderate.
3	MALICIOUS & TERRORISM DAMAGE.	No incident recorded at past. Exposure Low.
4	INNUNDATION	Plant has a good drainage system. No past record. Exposure Low.
5	AIR CRAFT DAMAGE	Far from air strip. Exposure Low.
6	STRUCTURAL COLLAPSE	Construction is done according to standards. Exposure Low.

7. NATURAL CALAMITIES: SR NO.

SR NO.	TYPE	EXPOSURE
1	Earth Quake	Durgapur lies in Seismic Zone –iii. Exposure - low.
2	Flood	No past record of flood. Exposure - low
3	Wind/cyclone	Durgapur falls in high damage risk zone-B (Vb-47m/sec). Exposure - Moderate.

8. OBJECTIVES OF THE PLAN:

- a) To control the emergency, localize it and if possible eliminate it.
- b) To avoid confusion, panic and to handle the emergency with clear cut actions.
- c) To minimize loss of life and property to the plant as well as to the neighborhood.
- d) To make head count and carry out rescue operations.
- e) To treat the injured persons.
- f) To preserve records and to take steps to prevent recurrence.
- g) To restore normalcy.

9. EMERGENCY CONTROL CENTRE:

For the purpose of handling emergency, the following Emergency Control Centers has been identified.

- During normal working hours – **Main Office Building.**
- During other times - **The Security Office.**

All communications to and from will originate at this CONTROL CENTRE. The Emergency Control Center will have the following: -

- a) A copy of ON-SITE EMERGENCY PLAN.
- b) List of important telephone numbers such as Police, Fire Brigade, Hospitals, and other outside Emergency Services, etc. (Refer Annexure B).
- c) List of key Personnel with addresses and telephone numbers. (Refer Annexure C).
- d) Information on Fire Fighting System (Refer Annexure E).
- e) Plant layout indicating storage of hazardous materials
- f) Fire Fighting System (layout of Fire Hydrants)
- g) First Aid box.

10. ASSEMBLY POINTS

In case of an EMERGENCY the employees should assemble near the defined Assembly Points, as indicated below: -

Location for assembly points		
Sr. No.	Area	Location no.
1	New extrusion near silo	1
2	Front of main office	2
3	Tunnel kiln entrance	3
4	LWG-4 area	4

Wind direction to be determined by the WIND SOCKS installed on top of the Silo. THE EMPLOYEES SHOULD RUN PERPENDICULAR TO THE WIND DIRECTION AND NOT AGAINST / ALONG THE WIND DIRECTION.

11. CODIFICATION OF SIRENS

Sr.	SIRENS	INDICATES	AUTHORITY
1.	30 SECOND CONTINUOUS	ON SITE EMERGENCY (ALERT)	INCIDENT CONTROLLER
2.	1 MINUTE CONTINUOUS	EMERGENCY CONTROLLED	SITE CONTROLLER

(ALL CLEAR)

NOTE: 1) EMERGENCY SIREN TO BE SOUNDED ONLY IF REQUIRED
 2) ALL EMPLOYEES IN AREAS OTHER THAN AFFECTED TO CONTINUE WORK UNLESS DISASTER SIREN IS BLOWN.
 3) NO EMERGENCY ORGANIZATION MEMBER WILL LEAVE THE EMERGENCY SPOT UNLESS 'ALL CLEAR' SIREN BLOWN.

12 . TRAINING AND EDUCATION:

Experience with on site –emergency planning has proved the need of training and rehearsal. Major emergency procedure should be laid down clearly and convincingly to everyone on site particularly Key Personnel and Essential workers.

It is obvious that in house or outdoor training is essential. The duties and responsibilities of each person and the emergency procedure to be followed by him should be very clear.

a. Seminar/refresher guidance On Site Emergency Plan.

b. Emergency instruction Booklet.

Seminar: Seminar is conducted in house/. Site controller will explain the plan to all associated concerned employees.

Expert from outside explain the plan to all associated concerned employees. Expert from also may be invited to impart training.

Emergency instruction Booklet:

Emergency instruction Booklet contains all detailed emergency duties. The booklet contains

- Emergency duties,
- Reporting relationship.

Thus everyone is conspicuous about his role in the Emergency Plan.

13. MOCK REHEARSAL:

- Inform all the employees about mock drill.
- Fix the date for mock drill.
- Observers will not be involved in the exercise. They will monitor the Mock drill.
- Emergency Siren / alarm will be raised.
- After hearing the Siren / alarm, Emergency procedure will be followed as mentioned in the OEP.
- Observer will note down the activities with respect to the time.

14. UPDATING THE PLAN:

As and when required the On Site Emergency Management plan will be updated. After each drill the plan will be thoroughly reviewed to take account of shortcomings and accordingly plan will be updated.

CHAPTER - 3

EMERGENCY ORGANISATION

SITE CONTROLLER: - Plant Head

INCIDENT CONTROLLER: - Plant Head

CONVEYING INFORMATION OF EMERGENCY: Duty officers/Shift-in-charges/Security officers

ADVISORY /REVIEW COMMITTEE: DH (Production)

DH (Maintenance)

SH. (Technical Control)

(Medical Officer)

(Safety Officer)

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COMMUNICATION COMMITTEE:

P&A DEPARTMENTS:

DH(P&A)

WELFARE OFFICER

OFFICER(P&A)

CHAPTER - 4

KEY PERSONNEL & THEIR RESPONSIBILITIES

Key Personnel's Responsibility during normal working hours:-

1. Site Controller:

He will retain overall responsibility for the factory and its personnel. As soon as he is informed of the emergency he shall proceed to the control room and meet the P&A Manager. His duties shall be:

- i) Assess the magnitude of the situation and decide if staff needs to be evacuated from their assembly points.
- ii) Exercise direct operational control over areas other than those affected.
- iii) Maintain a continuous review of possible development and assess in consultation with Incident Controller and other Key personnel as to whether shutting down of the plant or any section of the plant and evacuation of persons if required.
- iv) Liaison with Senior Officials of Police, Fire Brigade, Directorate of Factories, provide advice on possible effects on areas outside the factory premises.
- v) Control rehabilitation of affected areas on discontinuation of emergency.
- vi) Issue authorized statements to news media, and ensure that evidence is preserved for inquiries to be conducted by statutory authorities.

2. Incident Controller:

On hearing of an emergency siren he will rush to the scene of the occurrence and take overall charge and report to Site Controller. On arrival he will assess the scale of emergency and decide if major emergency exists or is likely and inform the Communication Officer accordingly.

- (1) Direct all operations within the affected areas with the priorities for safety of personnel, minimise damage to the plant, property and minimize loss of materials.
- (2) Pending arrival of Site Controller, assume the duties of his post and, in particular.
- (3) (a) Direct the shutting down and evacuation of plant and areas likely to be adversely affected by the emergency.
(b) Ensure that all Key personnel and outside help are called in.
- (4) Provide advice and information to the Fire squad & Security Officer and the local fire service as and when they arrive.
- (5) Ensure that all non-essential workers/staff of the areas affected are evacuated to the appropriate assembly points, and the areas are searched for casualties.
- (6) In the event of failure of electric supply and internal telephones, set up communication point and establish contact with Emergency Control Centre.

- (7) Report on all significant developments to the P. & A Manager.
- (8) Have regard to the need for preservation of evidence so as to facilitate any inquiry into the causes and circumstances, which caused or escalated the emergency.

3. Human Resources Manager:

He will also work as liaison Officer and will be stationed at the Main Entrance (Security Office near Main Gate) during the emergency. He will under the direction of the site Controller handle police, press and other inquiries, receive reports from roll-call leaders from assembly points and pass on the absentee information to the Incident Controller. His responsibilities shall include -

- (1) To ensure that casualties receive adequate attention, to arrange additional help if required and information relatives.
- (2) To control traffic movements into the factory and ensuring that alternative transport is available when need arises.
- (3) When emergency is prolonged, arrange for the relief of personnel and organise refreshments / catering facility.
- (4) From information received, advise the Site Controller of the situation, recommending (if necessary) evacuation of staff from assembly points.
- (5) Recruit suitable staff to act as runners between the Incident Controller and himself if the telephone and other system of communication fails due to whatsoever reasons.
- (6) Maintain prior agreed inventory in the control centre.
- (7) In case of prolonged emergency involving risk to outside areas by wind-blown materials, contact local Meteorological Office to receive early notification of changes in weather conditions.

4. Security Officer:

On hearing alarm advice fire squad and security staff in the factory of the incident zone and cancel the alarm. He will also announce through telephone or messengers to the HR Manager, Incident Controller and Site Controller that incident has occurred in such and such zone. He will open the gates nearest to the incident and stand by to direct the emergency service.

If told of a large escape of gas he shall inform the Incident Controller by telephone and stand-by the telephone to receive further messages. On hearing the emergency alarm, he will immediately contact Site Controller and on his advice call the local fire brigade. In case fire is discovered but no alarm is sounding he shall receive information about location from the person discovering the fire and thereafter immediately consult the Site Incident Controller and make announcement on telephone telling the staff location of the incident and to evacuate to their assembly points. He will continue to operate the switchboard advising the calls connected with the incident to the Communications Officer.

5. Departmental Heads:

The Departmental head wherein the incident has taken place will report to Incident Controller and provide assistance as required. They will decide which members of their staff they require at the scene.

6. First-aid Teams:

The Personnel Manager shall keep in security the roll call lists for the fire and first-aid teams on duty. Each Departmental Head for his shift-team appoints roll call leaders and first aiders. Roll call leaders shall check their rolls as members of the services report for emergency duty. Names of any unaccounted for absentees will be informed to the Security Officer.

Members of first-aid Teams will report to the Incident Controller on hearing of the alarm in day time. The Emergency vehicle driver, if safe to do so, shall collect the emergency vehicle and park nearest to the scene of the incident. First aider shall inform the incident controller that the Emergency Vehicle is leaving the site, giving the name of the patient and destination i.e. hospital or doctor's room and request the Incident Controller to inform the destination (hospital, etc.) advising them about the casualties reaching there.

7. Factory Fire Squad Personnel:

The duty Fire fighting Squad under the command of the Security Officer shall be responsible for fire fighting and rescue. On hearing the alarm, they shall proceed to the place of incident. The men at security gate shall find out the location of the emergency and proceed to the site of the occurrence. At the incident scene, a team members detailed for this purpose will check squad members against roll-call sheet. At the site, all the squad members will respond to the advice and information given by the Incident Controller On arrival of the local fire brigade, they will also assist in fire-fighting work with the advice of the Incident Controller.

CHAPTER - 5

EMERGENCY ACTION PLAN

ANY ONE NOTICING EMERGENCY SITUATION LIKE FIRE, EXPLOSION, TOXIC GAS LEAKAGE ETC. MUST

DO's

- Attract the nearby person/employee by shouting "FIRE – FIRE – FIRE. "
- Seek help from the persons working nearby.
- Try to control the incident at its initial stage with available means/sources quickly.
- Inform Shift In-charge / Duty Officer (In Night Shift) about the Incident.

DON'Ts

- Do not be panicky.
- Do not run – Walk fast.

INCIDENT CONTROLLER MUST

DO's

A. IF FIRE / OTHER INCIDENTS ARE CONTROLLABLE

- Approach the emergency site immediately taking note of wind direction.
- Assess the situation.
- Inform Security Officer, Tell – NAME, TYPE OF INCIDENT, ACTION TAKEN, HELP NEEDED and Order Security Officer/Guard to inform all KEY persons.
- Take lead in controlling emergency until such time concerned Section Manager takes over the charge.

DON'TS

- Do not be panicky.
- Do not lose temperament.

B. IF FIRE/OTHR INCIDENTS ARE NOT CONTROLLABLE

In Addition to Above (A)

- Order to blow emergency `ALERT' Siren (30 second continuous).
- Organize Fire fighting / rescue team members to control the Incident.
- Take stock of situation if required shut down the plant / process in affected area.
- Call Fire Brigade if situation demands.
- Evacuate affected area.
- Organize head count of the plant.
- Act as INCIDENT CONTROLLER till such time senior person takes charges as indicated in Emergency organization

NOTE: 1) Messenger will wait until such time Security Officer arrives.
2) Also inform Telephone Operator.

SECURITY OFFICER / GUARD

DO's

- Inform all key persons about location and type of emergency.
- Follow this sequence – Inform concerned HOD/Section Head, Main Site Controller, Main Incident Controller & Safety Officer and other KEY persons.
- Inform Main Site Controller about Government visitors, if any.

DON'Ts

- Do not entertain any outside call except for emergency purpose.
- Do not allow visitor to move around, from reception.
- Do not allow any vehicle to come inside the factory.

SECURITY GUARD**DO's**

- immediately report at Security Gate in shortest possible time.
- Follow instructions of Officer In-charge.
- Assist in controlling emergency.
- Assist in controlling contractors, vehicle movement and mob.
- Assist in cordoning off the area.
- Take note of wind direction while approaching emergency site.
- Render all possible help for controlling overall situation.

DON'Ts

- Do not leave the site unless asked to do so.

EMERGENCY VEHICLE DRIVER**DO's**

- immediately start vehicle and reach rescue squad assembly point (near security gate).
- Rescue squad members to emergency site.
- Take vehicle near to emergency site as directed.
- Take note of wind direction.
- Reverse the emergency vehicle for quick transports of injured, if any.
- Keep vehicle engine running.
- Always be on Driver's seat of the vehicle.
- Take the injured to the hospital as directed.

DON'Ts

- Do not leave the vehicle.
- Do not take the vehicle very near to the site.

INCIDENT CONTROLLER**DO's**

- Approach emergency site as early as possible taking note of wind direction.
- Take stock of situation.
- Interact with all concerned departments as the situation demands.

- Keep Main Site Controller informed about the latest emergency situation on continuous basis.

SITE CONTROLLER**DO's**

- Will approach emergency site immediately / Assess the situation.

- Consult Incident Controller.
- Consult advising Committee Members.
- Instruct Main Incident Controller.
- Communicate to higher ups and Govt. authorities, if required.
- Decide upon need for evacuation and blow `Disaster Siren`.
- After getting satisfied with the situation, give instruction to blow ALL CLEAR Siren.

DON'Ts

- Do not instruct to blow ALL CLEAR siren unless the situation is fully under control.
- Don't evacuate the entire plant unless the situation demands.

FIRE FIGHTING SQUAD ON HEARING SIREN**DO's**

- Inform fellow employees/Officers.
- Report to Fire Squad Assembly point.
- Find out emergency location.
- Approach emergency site immediately.
- Take quick action as per the instructions from Incident controller.
- Bring emergency under control as early as possible.

DON'Ts

- Do not leave process/equipment in **UNSAFE CONDITION**.
- Do not leave emergency site unless **ALL CLEAR** siren blown.
- Do not use improper fire extinguisher.
- Do not be panicky.

RESCUE SQUAD**DO's**

- Report to assembly point near Gate.
- Get in touch with security about location and type of emergency.
- Approach emergency site quickly with Breathing Apparatus set and First Aid box.
- Get in touch with incident controller.
- Follow instructions of Incident controller.
- Render first aid to the injured, hospitalize, if required.
- Accompany him to hospital and assist Doctor / Nurse.

- Search for missing person in that area, if required.
- Help in head count.

ALL GENERAL EMPLOYEES EXCEPT THOSE WHO ARE IN EMERGENCY ORGANIZATION ON HEARING SIREN

DO's

- Be alert and be available if required.
- Wait for further instructions.
- Bring down the process/plant/equipment in SAFE CONDITION in case of DISASTER siren as per instructions from Incident Controller.
- Approach respective safe assembling points route as taking note of wind direction.
- Help in taking roll call.
- After hearing ALL CLEAR, go back to the departments.
- Start the work again after setting instruction from Incident controller.

DON'Ts

- Do not be panicky. Do not run.
- Do not approach emergency site unless asked for.
- Do not engage telephone except for emergency purpose. Keep lines free.

TECHNICAL TEAM: ENGINEERING DEPARTMENT / ENVIRONMENT, SAFETY AND HEALTH DEPARTMENT ON HEARING SIREN

DO's

- Be available in Engineering Department at respective location for any help.
- Approach emergency site with required tools and equipments and should work on instructions of Incident controller.
- Help Incident Controller to provide technical assistance.
- Isolate lines, process equipments, if required by Incident Controller.
- Provide emergency equipments like Fire Extinguisher, Hoses, etc., if asked by Incident Controller.
- Provide stop gap arrangements as per the requirement of Incident Controller.
- Carry out electrical isolation of area as per instructions from Incident Controller.
- After the incident is over Safety Officer will ensure that the site is free from danger for resumption of work by confirming availability of sufficient oxygen, proper working of electrical wiring etc.

ADVISORY COMMITTEE (ALL DEPARTMENT HEADS)

DO's

- Approach emergency site as early as possible.
- Render advice to Main Incident Controller and Main Site Controller to control emergency.

COMMUNICATION COMMITTEE – (P&A)

DO's

- Consult Main Site Controller
- Give necessary instructions to security / Telephone Operator.
- Give instruction to Security to control traffic / crowd.
- Look after injured; communicate with the family members, if situation demands.
- Arrange transportation, if required.

DON'Ts

- Do not communicate to any one or brief press without permission of Main Site Controller.

GENERAL INTRUCTIONS

DO'S

- Stop work at height. / Stop all hot works.
- Stop all vessel entry.
- Take note of wind direction.
- On hearing Disaster Siren evacuates as per evacuation route without running and panicky and assembles at respective safe Assembly Points.

DON'Ts

- Do not use telephone except for emergency purpose.
- Do not start work at height, vessel entry, hot work unless permit conditions are verified.
- Do not allow unauthorized person to approach emergency site.

ANNEXURE 'A'

BRIEF DESCRIPTION OF THE MANUFACTURING PROCESS GRAPHITE ELECTRODE MANUFACTURING PROCESS.

Calcined Petroleum Coke (CPC) in small sizes are the basic raw materials which are procured indigenously and imported. They are stored in different silos depending on the grade. They are collected through Bucket Elevator to Screener for sizing & stored in CPC Bins according to the sizes. If require larger sizes particles are crushed to sizes. Binder Pitch procured in bags is also stored in Bins in Extrusion Department. Desired quantity of CPC & Binder Pitch are collected in weigh can & fed to the Mixer through gravity for mixing. After the components are properly mixed it is dumped in to the cooler for cooling.

Hot Mixes, about 170°C received from mixer are cooled in coolers applying air flow while rotating the materials to about 102 °C. Cooled materials are then dumped to Extrusion Press. Material received from the cooler in the mud pot of the Extrusion Press. This material is then extruded at high pressure & cut in to desired length by a cutter. For this purpose different sizes of Die are used. This product is called 'Green Stock'.

Green Stock are loaded in totally sealed pit type Baking Furnace to heat about 850 °C using Furnace oil / CBM Gas. All sides of the stock are covered with CPC Pack to retain its shape. All sections are covered so that the hot flue is utilized & circulated through subsequent sections till the temperature of the outgoing gases drops to 90 °C before entering to ESP. This fume is further cooled to 70 °C during passing to ESP.

Hot stocks are allowed to cool down inside the pit in packed condition to 150 °C by allowing fresh air. In the process the fresh air gets preheated before entering to the firing chamber. An intermediate process in which Baked/Rebaked electrodes are preheated & then liquid pitch is forcibly Impregnated under high pressure inside an Autoclave. This stock is then send for rebaking which is done in the same Baking Furnace.

Baked or Rebaked stock is then loaded in the Electric Furnace known as Length Wise Graphitization (LWG) Furnace. In these furnaces the electrodes are placed lengthwise connecting one electrode with the other & held in position by hydraulic pressure so that current can flow uniformly. These electrodes are covered with packing of CPC so that heat generated in the process is retained within the furnace. LWG furnaces are DC furnaces, in which low voltage & high amperage is passed through the electrodes for 12 to 16 hrs at a predefined rate by virtue of which stocks get heated up gradually to high temperature of about 3000 °C . After this temperature is achieved the furnace is allowed to cool naturally for 2 to 3 days.

The graphite Electrodes are inspected & tested for its physical & dimensional properties as per the requirement of the customer by the Quality Assurance Team. The thread in the electrodes & the nipples (for connecting of two electrodes) are made.

Graphite Electrodes are in Pallets, the Nipple in Carton & Wooden Boxes are packed & kept in covered dry places till it is dispatched.

ANNEXURE 'B'

TELEPHONE NUMBERS OF POLICE, FIRE BRIGADE, HOSPITALS, AND OTHER OUTSIDE EMERGENCY

SERVICES :-

ADM-DURGAPUR(CEO-ADDA)	0343-2205374
SP-BURDWAN	0342-266-2956
ASP-DURGAPUR	0343-2545053
SDPO-DURGAPUR	0343-2546680
POLICE DEPT- DURGPUR P.S	0343-256-4081
NEW TOWNSHIP	0343-2502242
FARIDPUR	0343-254-5085
SDO-DURGAPUR	0343-254-6680
FIRE BRIGADE- CITY CENTRE	0343-254-6061
DSP TOWNSHIP	0343-256-3557
DIVISIONAL CONTROL(PANAGARH)	0343-252-4255
INSPECTOR OF FACTORIES	0343-254-6010
HOSPITALS: -	
BIDHANNGAR SDO	0343-253-7163
HOSPITAL(SUPER)	
ESI HOSPITAL	0343-253-4378
DSP HOSPITAL	0343-256-3522
DPL HOSPITAL	0343-255-5008
MISSION HOSPITAL	9800881600
VIVEKANANDA HOSPITAL	8001024444
DM –BURDWAN	0342-2662428

ANNEXURE 'C'**TELEPHONE NUMBERS OF KEY PERSONNEL**

LIST OF KEY PERSONS	MOBILE. NO.	
Plant Head	6292245578	
DH (Production)	7439040781	R7
DH (Maint- Mechanical)	7439494303	
DH(Extrusion)	9332039294	
DH (Baking)	7477783949	R7
DH(Graphite)	7477783949	
DH(Finishing)	9333743846	
DH (Process)	9332039174	
SH (Baking)	9332023305	
SH (By-Product)	9332039296	
DH (MIS)	9332039304	
DH(P&A)	9332801439	
DH(Safety)	7602340101	
Safety Officer	9332022477	
GATE-SECURITY	9332021375	
Welfare Officer	9064070069	R7
Security In charge	8967998666	

Note : Beside above, Cell Phone communication system have been provided for use in Emergency. DH-Departmental Head, SH-Section Head.

ANNEXURE D



INDIA CARBON LIMITED

TELEPHONE : (033) 2248-7856 / 9
 FAX : 91-33- 2230-7507
 E-mail : icl@indiacarbonltd.com
 Website : www.indiacarbonltd.com

"TEMPLE CHAMBERS", 4TH FLOOR,
 6, OLD POST OFFICE STREET
 KOLKATA - 700 001

MATERIAL SAFETY DATA SHEET

1.) Product Name: CALCINCED PETROLEUM COKE
Synonyms: Calcined Petroleum Coke
Manufacturer: INDIA CARBON LIMITED

2.) INFORMATION ON INGREDIENTS

	EINECS	PERCENT	CAS NO:
CALCINCED PETROLEUM COKE		100%	64743-05-1

3.) HAZARDS IDENTIFICATION

Emergency Overview:

Calcined petroleum coke is not considered to be hazardous as defined by OSHA's Hazard Communication Standard 29 CFR 1910.1200. Calcined petroleum coke is considered to be an inert material.

Potential Health Effects:

Excessive concentrations of Calcined petroleum coke may reduce visibility, cause unpleasant deposits in the eye, ears, and nasal passages, or irritate the skin or mucous membranes by mechanical means. However, normal workplace exposure has not been determined to cause a significant health effect. Calcined petroleum coke, as with many petroleum products, may cause minor skin, eye, or lung irritation, but good hygienic practices can minimize these effects.

4.) FIRST AID MEASURES

Inhalation:

Remove to fresh air. If breathing has stopped, administer artificial respiration and supply oxygen. If problem persists, seek medical attention.

Skin Contact: Particles should be periodically washed off of skin with soap and water.

Eye Contact:

Immediately flush eyes with plenty of water until irritation subsides. If irritation persists, seek medical attention.

Ingestion Contact:

Do not induce vomiting. Immediately give water. Never give anything by mouth to an unconscious person. If symptoms develop, seek medical attention.

This material is not listed as a Carcinogen or Potential Carcinogen by the NTP, IARC or OSHA.

REGISTERED OFFICE : NOONMATI, GUWAHATI - 781020, ASSAM



5.) FIRE FIGHTING MEASURES

Extinguishing Media:

Water fog, dry chemical, foam, or carbon dioxide.

Special Fire Fighting Procedures:

Most reported coke fires have occurred when produced Calcined coke is inadequately cooled and stored in a manner that allows the movement of air through the coke bed. May burn if exposed to temperatures greater than 1290F (700C). Should a fire occur, its locations and extent should be determined as quickly as possible. The best procedure is to dig out and remove the coke in the heated zone. The hot coke should be drenched with water as it is exposed.

Fire and Explosion Hazards:

There is a possibility of a steam explosion when introducing water into confined storage such as a silo. There is no dust explosion hazard from Calcined petroleum coke. This product also may burn if exposed to temperatures greater than 700 C (1290 F).

Hazardous Combustion Products:

Products of combustion may contain carbon monoxide, carbon dioxide, and sulfur dioxide.

Protective Measure in Fire:

Do not enter permitted confined space or enclosed area without proper PPE.

6.) ACCIDENTAL RELEASE MEASURES

Personal Precaution in Spill:

Wear PPE as directed in Section 10.

Environment:

Provisions should be made to prevent washing, draining, or directing material to storm or sanitary sewers.

Spill Clean Up:

Material is not toxic and can be picked up by sweeping, shoveling, or vacuuming.

7.) HANDLING/STORAGE

Usage Precautions:

Usage Descriptions:

Storage Precautions:



Handling Precautions:

Coke should be well quenched or cooled before it is stored in a pile out of doors or placed in silos or bins. Storage should be arranged to prevent movement of air through coke. Whenever possible, bulk material in silos should be removed and material drenched in an open area.

8.) EXPOSURE CONTROLS / PERSONAL PROTECTIONProtective Equipment:

Dust should be controlled at point of operation.
Process Conditions: 250 mg/m³ as total particulate matter³

Respirators:

Select appropriate NIOSH-approved protection where necessary to maintain exposures below the acceptable limits. Proper respiratory selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure, and published respirator factors.

Protective Gloves:	None.
Eye Protection:	None required. Recommend using dust goggles in areas of high dust concentrations.
Other Protection:	None.

Hygienic Work Practices:

Material is not toxic and can be picked up by sweeping, shoveling, or vacuuming. Provisions should be made to prevent washing, draining, or directing material to storm or sanitary sewers.

9.) PHYSICAL / CHEMICAL PROPERTIES

Appearance:	Solid	Color:	dark gray to black
Odor/Taste:	Odorless	Specific Gravity:	1.8
Solubility:	Not soluble in water.	Solubility Value:	Not applicable
Melting Point:	Not applicable.	Boiling Point:	Not applicable.
Decomp Temp:		Flash Point:	
pH:			

10.) STABILITY / REACTIVITY

Stability:	Stable.
Hazardous Decomp Products:	CO, CO ₂ , SO ₂
Conditions to Avoid:	Strong oxidizing acids, other strong oxidants, extreme heat, and open flames



11.) TOXICOLOGICAL INFOMATION

Toxic Dose LD 50:	No information found.
Toxicological Info:	Petroleum coke was found not to be mutagenic in a rat in vivo Bone Marrow Cytogenic test, a mouse Lymphoma assay, and an Ames Mutagen city assay.
Inhalation:	Petroleum coke was found not to be carcinogenic in monkeys and rats in a two-year inhalation study at concentrations up to 30 mg/m3.
Skin:	Petroleum coke was found to be non-carcinogenic in mice in chronic skin painting studies with coke dust.
Eyes:	No information found.
Medical Symptoms:	Chronic inflammatory changes similar to those produced by non-specific respiratory irritants were observed in some rats at the highest exposure level.

12.) ECOLOGICAL INFORMATION

Toxicity:	No information found.
Distribution:	No information found.
Chemical Fate:	No information found.

13.) DISPOSAL CONSIDERATIONS

Disposal Methods: All Federal, State, and Local regulations regarding health and pollution must be followed for disposal of Calcined Petroleum Coke.

General Cleaning: Product may be picked up by sweeping shoveling or vacuuming, however provisions to prevent wahing, draining, or directing material to strom or sanitary sewers should be taken.

14.) TRANSPORTATION INFORMATION

<p>DOT - GROUND TRANSPORTATION: Proper Shipping Name: CALCINCED PETROLEUM COKE Hazard Class: Not Regulated. UN. NO#: Not Regulated. Packing Group #: Not Regulated. / / Not Regulated. Shipping Options for this product include:</p>	<p>IATA/IMDG REGULATIONS: Proper Shipping Name: C.P.C Hazard Class: Not Regulated. UN. NO#: Not Regulated. Packing Group #: Not Regulated./ / Not Regulated. IMDG EMS: Not Regulated.</p>
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Transportation Notes:

Regulated by water mode only, when temperatures exceed 130 F, Petroleum Coke, Calcined, not regulated by IMO. Must be loaded in cargo vessels when the temperature exceeds 225 F (46 CFR 148.04-17)

15.) REGULATORY INFORMATION

N.A

16.) INFORMATION SOURCES

Information Sources:	
Revision Comments:	N.A.
Other Information:	
Disclaimer:	



Page 5 of 5

KONARK TAR PRODUCTS (P) LTD.

ADDA INDUSTRIAL PLOT, LENIN SARANI,
DURGAPUR 713201, WEST BENGAL, INDIA

COAL TAR PITCH Binder
Pitch Impregnating Pitch

5610-00F025191

1. Product Identification

Product ID: **COAL TAR PITCH**
MSDS Date:09/01/2005
CAS REGISTRY NUMBER : 65996-93-2
COMPOUND DESCRIPTOR : Tumorigen
FSC:5610
NIIN:00F025191
MSDS Number: BNZJK

2. Composition/Information on Ingredients

Ingred Name:COAL TAR PITCH (SUSPECTED A1 HUMAN CARCINOGEN BY ACGIH, NTP)
CAS:65996-93-2
RTECS #:GF8655000
Other REC Limits:0.1 MG/CUM
OSHA PEL:200 MG/CUM
ACGIH TLV:0.2 MG/CUM (A1)

3. Hazards Identification

Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES Reports of
Carcinogenicity: NTP:YES IARC:YES OSHA:NO
Health Hazards Acute and Chronic:EYE: IRRITATION/CORNEAL CHANGE/THERMAL
BURN. SKIN: IRRITATION/HARMFUL/PHOTOTOXIC REACTION/CANCER/THERMAL
BURN. INHALATION: HARMFUL/RESPIRATORY TRACT IRRITATION &
DIFFICULTIES/CNS EFFECT/CARDIOVASCULAR COLLAPSE. INGESTION: GI
DISTURBANCE/IRRITATION/NAUSEA/VOMITING/ABDOMINAL
PAIN/HARMFUL/CARDIOVASCULAR INVOLVEMENT.

Explanation of Carcinogenicity:SEE INGREDIENTS.

Effects of Overexposure:EYE: IRRITATION/CORNEAL CHANGE/THERMAL BURN.
SKIN: IRRITATION/HARMFUL/PHOTOTOXIC REACTION/CANCER/THERMAL BURN.
INHALATION: HARMFUL/RESPIRATORY TRACT IRRITATION & DIFFICULTIES/CNS
EFFECT/CARDIOVASCULAR COLLAPSE. INGESTION: GI
DISTURBANCE/IRRITATION/NAUSEA/VOMITING/ABDOMINAL PAIN/HARMFUL/CARDIOVASCULAR
INVOLVEMENT.

Medical Cond Aggravated by Exposure:LIVER/KIDNEY/SKIN/CNS/RESPIRATORY
DISEASES

4. First Aid Measures

First Aid:EYE: IMMEDIATELY FLUSH W/LARGE AMOUNTS OF WATER FOR 15 MINS.

SKIN: WASH THOROUGHLY W/WATERLESS HAND CLEANER. FLUSH W/LARGE AMOUNTS OF COLD WATER. SUBMERGE AREA IN COLD WATER. PACK W/ICE. INHALATION: REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED OR IS DIFFICULT, ADMINISTER ARTIFICIAL RESPIRATION OR OXYGEN. OBTAIN MEDICAL ATTENTION IN ALL CASES.

5. Fire Fighting Measures

Flash Point Method:COC Flash Point:302F
Extinguishing Media:DRY CHEMICAL, CO2, FOAM, OR WATER SPRAY. WATER OR FOAM MAY CAUSE FROTHING, IF MOLTEN.
Fire Fighting Procedures:WEAR FULL FACE APPROVED SELF-CONTAINED BREATHING APPARATUS. USE WATER TO COOL FIRE-EXPOSED CONTAINER/STRUCTURE/PROTECT PERSONNEL.
Unusual Fire/Explosion Hazard:FIRE GIVES OFF TOXIC VAPORS. VAPORS ARE RELEASED/DUST MAY FORM EXPLOSIVE MIXTURES IN AIR. CLOSED CONTAINERS EXPLODE IN HEAT. COMBUSTIBLE AT HIGH TEMPERATURES.

6. Accidental Release Measures

Spill Release Procedures:SOLIDIFIED SPILL: SHOVEL INTO DRY CONTAINERS/COVER. FLUSH AREA W/WATER. CONTAIN RUNOFF FROM FIRE CONTROL/DILUTION WATER. TREAT AS A COAL SPILLAGE/RECOVER SPILLAGE. IF HOT LIQUID IS SPILLED, CONTAIN W/ SAND/ASHES. ALLOW TO COOL/SCRAPE UP/DISPOSE.

7. Handling and Storage

Handling and Storage Precautions:AVOID CONTACT W/SKIN & EYES. KEEP IN A CLOSED, LABELED CONTAINER W/IN A COOL, WELL SHADED, DRY VENTILATED AREA. AVOID INHALATION OF DUSTS/VAPORS.
Other Precautions:PROTECT FROM PHYSICAL DAMAGE. READ/UNDERSTAND MSDS. APPLY PROTECTIVE CREAMS BEFORE WORKING/SEVERAL TIMES DURING WORK. DON'T USE/STORE IN HOME. DON'T INGEST. DON'T WEAR CONTACT LENS W/OUT PROPER EYE PROTECTION WHEN USING PRODUCT.

8. Exposure Controls/Personal Protection

Respiratory Protection:USE MSHA/NIOSH APPROVED COMBINATION FILTER/ORGANIC VAPOR CARTRIDGES OR CANISTERS. FULL-FACE PIECE RESPIRATORY PROTECTIVE UNITS REQUIRED.
Ventilation:SUFFICIENT GENERAL/LOCAL EXHAUST: IN PATTERN/VOLUME TO CONTROL INHALATION EXPOSURES & TO KEEP <TLV.
Protective Gloves:HEAT RESISTANT INDUSTRIAL FABRIC-TYPE Eye Protection:INDUSTRIAL SAFETY GLASSES, GOGGLES
Other Protective Equipment:SIDE/FACE SHIELD/INDUSTRIAL-TYPE WORK CLOTHING/SAFETY FOOTWEAR/HEAT & NECK COVER/APRON/JACKET/PANTS/COVERALLS/BOOTS
Work Hygienic Practices:PRACTICE GOOD HYGIENE. MAINTAIN GOOD HOUSEKEEPING. WASH BEFORE EATING/DRINKING/USING TOBACCO PRODUCTS OR REST ROOMS.
Supplemental Safety and Health

9. Physical/Chemical Properties

Boiling Pt:B.P. Text:500F Vapor Pres:1
Vapor Density:1
Spec Gravity:1.22
Evaporation Rate & Reference:(ETHER = 1): 1
Solubility in Water:NEGLIGIBLE
Appearance and Odor:BLACK SOLID W/NO ODOR AT 69.8F, AROMATIC ODOR AFTER



MELTING.
 Percent Volatiles by Volume:NEGL

10.Stability and Reactivity Data

Stability Indicator/Materials to Avoid:YES
 Stability Condition to Avoid:EXTREME HEAT, PHYSICAL DAMAGE
 Hazardous Decomposition Products:TOXIC FUMES

11.Disposal Considerations

Waste Disposal Methods:DISPOSE OF AS A HAZARDOUS WASTE ACCORDING TO LOCAL, STATE, & FEDERAL REGULATIONS. PLACE IN TIGHTLY SEALED LABELED CONTAINERS.

Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

12. Toxicological Information

Toxicological Data:

Oral rat LD50: 2700 mg/kg; skin rabbit LD50: 10,500uL/kg; inhalation rat LC50: 12100 mg/m3/8H; irritation skin rabbit, Draize 490 mg, open mild; eye rabbit, Standard Draize 40 mg moderate; investigated as a reproductive effector. **Reproductive Toxicity:**

In laboratory animals, this compound has caused both birth defects and damage to the reproductive system.

Cancer Lists

Ingredient Category	Known	---NTP Carcinogen---	
		Anticipated	IARC
Coal Tar Organic Compound	No	No	None

13. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into water, this material is expected to readily biodegrade. When released into water, this material is not expected to evaporate significantly. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by



reaction with photochemically produced hydroxyl radicals. When released into the air,

this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:

The LC50/96-hour values for fish are between 10 and 100 mg/l.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: Coal Tar Pitch

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 1000mg

International (Water, I.M.O.)

Proper Shipping Name: Coal Tar Pitch

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 1000mg

International (Air, I.C.A.O.)

Proper Shipping Name: Coal Tar Pitch

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 1000mg

15. Regulatory Information

Chemical Inventory Status - Part 1

Ingredient	TSCA	EC	Japan	Australia
Coal Tar Organic	Yes	Yes	Yes	Yes

Chemical Inventory Status - Part 2

--Canada--

Ingredient	Korea	DSL	NDSL	Phil. Coal
Tar Organic	Yes	Yes	No	Yes

Federal, State & International Regulations - Part 1

	-SARA 302-	-----SARA 313-----		
Ingredient	RQ	TPQ	List	Chemical Catg.
Coal Tar Organic		No	No	No



Federal, State & International Regulations - Part 2

Ingredient	CERCLA	-RCRA-	-TSCA-
Coal Tar Organic	1	261.33 No	8(d) No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No SARA
 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
 Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2[S] **Poison**

Schedule: None allocated. **WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 2 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. FLAMMABLE LIQUID AND VAPOR. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM, BLOOD AND BLOOD FORMING ORGANS, AND REPRODUCTIVE SYSTEM. POSSIBLE BIRTH DEFECT HAZARD. MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA.

Label Precautions:

Avoid breathing vapor.
 Avoid contact with eyes, skin and clothing.
 Keep away from heat, sparks and flame.
 Keep container closed.
 Use only with adequate ventilation.
 Wash thoroughly after handling.

Label First Aid:


If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent. Revision
 Information: No changes.

B.P-LAB-SM-01

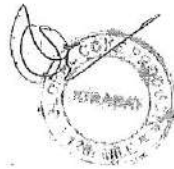
MATERIAL SAFETY DATA SHEET

SECTION I	
Identify: <i>Low Ash Metallurgical Coke</i>	
Manufacturer's Name: <i>Global Coke Products</i>	Emergency Telephone Number: 91 - 361 - 2464932
Address: <i>Global Coke Products: Vill : Ambher, 12th Mile Near jorabat, Kamrup, Assam</i>	Telephone Number for Information: 91 - 361 - 2464933, 34
	Date Prepared: 21.01.2013
Signature	 Manager - Technical.
SECTION II	
Hazardous Ingredient / Identity Information:	
Hazardous Component's (Specify Chemical Identity / Common Name (s): None	OSHA PEL Other None
SECTION III	
Physical Chemical Characteristics:	
Specific Gravity (H ₂ O = 1)	1.65 - 1.80
Solubility in Water:	Insoluble.
Appearance and Odor:	Hard and Black & Odorless.
Boiling Point	4827 ^o C.
Melting Point	3367 ^o C.
SECTION IV	
Fire and Explosion Hazard Data:	
Flammable limits 8000 C. with Oxygen	
Extinguishing Media:	Stop Oxygen and supply Water.
No Explosion Hazard:	None
SECTION V	
Reactivity Data:	
Stability:	Stable.

Contd.....(2)

(2)

SECTION VI	
Health Hazard Data:	
Health Hazards (Acute and Chronic):	<i>None.</i>
Allergic Conditions:	<i>NA.</i>
Carcinogen city:	<i>NA.</i>
Symptoms of Exposure:	<i>NA.</i>
SECTION VII	
Precautions for Safe Handling / Use:	
Steps to be taken in case Material is Released or Spilled:	<i>Sweeping.</i>
Waste Disposal Method:	<i>Normal methods.</i>
Precautions to be taken in Handling and Storing:	<i>Can get contaminated by any other material.</i>
Other Precautions:	<i>None.</i>
SECTION VIII	
Control Measures:	
Respiratory Protection (Specify Type) :	<i>NA.</i>
Ventilation:	<i>Local exhaust.</i>
Protective Cover:	<i>Not necessary.</i>
Eye Protection:	<i>Colourless Goggles.</i>
Other Protective Clothing or Equipment:	<i>Normal clothing.</i>
Work / Hygiene Precautions:	<i>Keep work area clean.</i>



ConocoPhillips

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY

PRODUCT NAME

PETROLEUM COKE (CALCINED)

Sheet	1 of 4
Revision No	3
Printed copies are uncontrolled	
Last Revision Date : December 2004	

SYNONYM: PETROLEUM COKE FINES

CAS No: 64743-05-1
 EINECS No: 265-210-9

NAME AND ADDRESS OF MANUFACTURER/SUPPLIER

ConocoPhillips Ltd, Humber Refinery, South Killingholme, North Lincolnshire, DN40 3DW
 Telephone No. 01469 571571
 Emergency Tel. No. 01469 555243
 Facsimile No. 01469 555143

APPLICATION

2. COMPOSITION / INFORMATION ON INGREDIENTS

Components:	Petroleum Coke, Calcined.
CAS No:	64743-05-1.
%	100
UK Exposure Limit:	Respirable Dust 8 Hour <u>mg/m³</u> 4.00
OES:	
UK Exposure Limit:	Total Inhalable Dust 8 Hour <u>mg/m³</u> 10.00
OE:	
UK Exposure Limit:	Coke Fibres 8 Hour <u>mg/m³</u> N/A (See Section 8. Personal Protective Equipment)
OE:	
NOTE	OES = Occupational Exposure Standard

PRODUCT NAME

PETROLEUM COKE (CALCINED)

Sheet	2 of 4
Revision No	3
Printed copies are uncontrolled	
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3. HAZARDS IDENTIFICATION

The product has a low degree of toxicity by inhalation and other routes of exposure (See Section 11, Toxicological information). The low toxicity or 'nuisance dust' exposure values listed above apply to any inert substance capable of producing airborne particles and should be applied to this material. Excessive concentrations of nuisance dusts may reduce visibility, cause unpleasant deposits in the eyes, ears and nasal passages and irritate the skin and mucous membranes by mechanical means. However, workplace exposure is not known or expected to cause a significant health effect.

4. FIRST AID MEASURES

Inhalation:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing difficult, give oxygen. Call a doctor.
Skin:	Wash thoroughly with soap and water after contact. If irritation develops, consult a doctor.
Eyes:	In case of contact, immediately flush the eyes with plenty of water for at least 15 mins. Call a doctor.
Ingestion:	No specific intervention is indicated as material is not likely to be hazardous by ingestion. Consult a doctor if necessary.

5. FIRE-FIGHTING MEASURES

Fire Risk:	Flammable properties: Flash Point - no applicable test. Hazardous gases/vapours produced by fire are carbon monoxide, carbon dioxide and other toxic materials.
Fire Fighting Procedures:	The most effective method is drenching with water or water fog. Other forms of extinguishing agent may be used but are less effective for deep seated smouldering fires.
Fire Fighting Instructions:	Do not enter enclosed or confined space without proper protective equipment including respiratory protection.
Extinguishing Media:	Water (Spray, Water Fog).

6. ACCIDENTAL RELEASE MEASURES

Contain spill immediately in smallest area possible. Recover as much of the material itself as possible using a shovel or mechanical means. Non-recyclable material and contaminated soils and other materials should be placed in proper containers for storage and ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

7. HANDLING AND STORAGE

Handling
 Use appropriate PPE to protect from the abrasive nature of the material. Wash thoroughly after handling. Wash clothes after use.
 Always sheet open trucks before moving on public roads.

Storage Method
 Suitable storage materials and coatings: Polyethylene bags, metal drums, fibre drums and covered or enclosed vehicles and ships. Store in silos, enclosed piles, trucks or rail cars.

Unsuitable Handling or Storage: Anything that does not maintain a tight seal to prevent dust or spillage. Open trucks must always be sheeted.

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PRODUCT NAME:

PETROLEUM COKE (CALCINED)

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- Engineering Controls :** Ventilation: Keep area well ventilated to minimize dust exposure.
- Personal Protective Equipment :** Respiratory Protection: Small concentrations of airborne respiratory coke/carbon fibres may be present in calcined coke. A high efficiency P3 dust respirator approved to CEN standard EN149 (disposable) or EN 405 (half-mask), should be used when conducting maintenance activities or other operations (e.g. sweeping, loading, grinding), likely to generate large amounts of dust, unless such activities have been characterised for the presence of airborne fibres. Manufacturers of carbon fibres have recommended exposure limits of between 1 and 5 fibres/ml. 8 hour time-weighted average. Where airborne dust concentrations are expected to exceed exposure limits for nuisance dusts, an approved P2 disposable or cartridge respirator may be used. Proper RPE selection should be determined by adequately trained personnel and based on the potential exposure and published Protection Factors.
- Protective Gloves :** Wear impervious gloves.
- Eye Protection :** Use close fitting goggles (approved to standard EN 166).
- Other Protective Equipment :** Sufficient clothing to minimise skin exposure. Launder contaminated clothing before reuse.
- Other Precautions :** Wash thoroughly with soap and water to avoid prolonged skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance :	Solid, dark gray to black	Odour :	Odourless
Boiling point (C) :	>4800	Flash Point (C) :	N/A
Density (kg/l) :	8.00	Melting Point (C) :	>3550

10. STABILITY AND REACTIVITY

- Stability :** Stable and not reactive under normal conditions.
- Incompatibility with other materials :** Incompatible with strong oxidisers.
- Decomposition :** Combustion may produce oxides of sulphur and carbon. Incomplete combustion may produce carbon monoxide. Polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

Lifetime skin painting studies in mice in which petroleum coke was applied as a 25% mineral oil solution were negative. Repeated exposure of rats to 10 and 30 mg/m³ petroleum coke dust for two years resulted in signs of lung injury including fibrosis (scarring of lung tissues), but similar exposures in monkeys caused no significant lung effects.

Respirable fibres have been detected in calcined coke. The fibres are amorphous and generally irregularly shaped, rather than having the crystalline appearance of carbon fibres. Coke fibres have not been studied, but recent laboratory animal studies have shown that carbon fibres are biopersistent in the lung. However, the studies also demonstrated a lower inflammatory response in the lung and less proliferation of the alveolar cells than fibres that are known to cause fibrosis and lung cancer.

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PRODUCT NAME

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PETROLEUM COKE (CALCINED)**12. ECOLOGICAL INFORMATION**

No environmental studies on petroleum coke have been published in the open scientific literature.

Calcined Petroleum Coke is a solid composed of carbon and other high molecular weight and water insoluble materials. Some metals are present but at very low concentrations.

13. DISPOSAL CONSIDERATIONS

Treatment, storage, transportation and disposal must be in accordance with applicable local regulations. Do not flush to surface water or sanitary sewer system.

14. TRANSPORT INFORMATION

Regulated by IMO as 'material hazardous only in bulk'. See IMO Bulk Code Nos. 41145 for loading requirements. ICAO - not regulated.

15. REGULATORY INFORMATION

No information available.


16. OTHER INFORMATION

The following Safety Phrases have been assigned to this product: -

Safety Phrases	24	Avoid contact with the skin
	25	Avoid contact with the eyes
	36	Wear suitable protective clothing
	37	Wear suitable gloves
	38	In case of insufficient ventilation, wear suitable respiratory equipment.

This data sheet has been revised in Sections 2,3, 8 and 11.

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	P-06 Low Sulfur #1 Furnace Oil (Clear or Dyed) Frontier El Dorado Refining Company	
-----------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------	--

	I. Chemical and Manufacturer Identification	
--	----------------------------------------------------	--

Product Name: P-06 Low Sulfur #1 ~~Furnace Oil~~ (Clear or Dyed)

2
1 0

Chemical Family: Diesel Fuel
Chemical Synonym(s): Low Sulfur Diesel - #1, K-1 Kerosene
Rating Scale:
 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe 5=N/A.

Specific Hazard
 RADIATION
 OXY Oxidizer
 Use No Water
 COR Corrosive
 Special Disposal
 ALK Alkali
 ACID

	NFPA	GERCLA	Other HMIS
Flammability	1		1
Corrosivity	2		2
Reactivity	0		0

Acid

Specific Hazard

Manufacturer: Frontier El Dorado Refining Company

Address1: PO Box 1121
Address2: 1401 S. Douglas Road
City: El Dorado **State:** KS **Zip:** 67042
Phone: 316-321-2200

Emergency Phone: 316-321-2200

CHEMTREC Emergency Phone: 800-424-9300

Chemical Name:
Mixture: No
Chemical Type: Hazardous
Formula:
Molecular Weight:
MSDS Number: P-06
MSDS Date: 01/17/2001
Tracking #: 26110

Precautionary Labeling: WARNING! MAY CAUSE DIZZINESS AND DROWSINESS. MAY CAUSE EYE IRRITATION. ASPIRATION HAZARD IF SWALLOWED. CAN ENTER LUNGS AND CAUSE DAMAGE. COMBUSTIBLE LIQUID AND VAPOR. USE ONLY AS FUEL.

Appearance: Clear or dark red when dyed
Odor: Petroleum Odor

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Inhalation: Not determined

Chronic Effect:

Mutagenicity:

RTECS #:

Other Toxic Effects: Middle distillates have caused skin irritation and skin cancer in laboratory animals when repeatedly applied and left in place between applications. Studies to further evaluate the carcinogenic potential of middle distillates are currently underway. Kidney damage had also been observed in laboratory animals exposed to middle distillates.

Other Notes:

XII. Ecological Information

Ecotoxicological Information: Not determined

Chemical Fate Information: Not determined

Other Ecological Notes: Not determined

Other Notes:

XIII. Disposal Methods

Disposal Methods: This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitability.

Other Notes: This product is potentially biodegradable.

XIV. Transportation Information

Proper Shipping Name: Fuel Oil

Name:

UN/NA #: NA 1993

U.S. Customs Harmonization #:

D.O.T.

Hazard Class: Combustible Liquid

Reportable Quantity: See Section XV, CERCLA, for RQ listings.

Regulatory References: LAND TRANSPORT ONLY-49CFR 173.120(1)(2)

Label: None

Packaging Group: III

Placard:

Marking:

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Teratology Information:
Cancer Information:
Listed as a Carcinogen By: NTP: No IARC: No OSHA: No Z-LIST: Yes

Other Notes: Chronic: NIOSH has recommended that whole diesel exhaust be regarded as a potential occupational carcinogen, based on findings of carcinogenic responses in laboratory animals exposed to whole diesel exhaust. The excess cancer risk for workers exposed to diesel exhaust has not been calculated; the probability of developing cancer should be decreased by minimizing exposure to the lowest feasible limits. Repeated skin contact may cause a persistent irritation or dermatitis.

IV. First Aid Measures


Eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire eye and lids with water. Get medical attention.
Skin: Remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Get medical attention if skin irritation persists or contact has been prolonged. Destroy non-resistant footwear.
Inhalation: If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.
Ingestion: If person is conscious and can swallow, give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Note to Physician:
Other Notes: Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing. Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

V. Fire Fighting Measures

Flammable Classification Under 29 CFR:
Flammable Limits: LEL:0.5 UEL:4.4
Flash Point: = 130 Deg F
Method: CC
Flame Propagation Rate:
Auto Ignition Temperature: 480 Deg F
Extinguishing Media: Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers.
Fire Fighting Procedures: Wear full protective clothing and positive pressure self-contained breathing apparatus.

Unusual Hazards: None
Hazardous Products:

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VI. Accidental Release Measures

Spill/Leak Clean Up Procedures: Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

Spill Evacuation Procedures:

Other Notes: If more than a reportable quantity of product is spilled, then report spill according to SARA 304 and/or CERCLA 102 (a) requirements, unless product qualifies for the petroleum exemption (CERCLA Section 101(14)).

VII. Handling and Storage Measures

Handling

Precautions:

Storage

Precautions:

Hygiene Practices:

General

Precautions:

Other Notes:

VIII. Exposures, Controls and PPE

Engineering

Controls:

Mechanical

Ventilation:

Local

Ventilation:

Special

Ventilation:

Other

Ventilation:

Respirator:

Eye Protection:

Hand Protection:

Protective

Clothing:

Local exhaust ventilation recommended if generating vapor, dust or mist. If exhaust ventilation is not available or adequate, use NIOSH approved respirator as appropriate.

Airborne concentrations should be kept to lowest levels possible. If vapor mist is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Gloves resistant to chemicals and petroleum distillates required. When handling large quantities gloves must be worn. The use of Nitrile protective material is recommended.

Protective clothing such as coveralls or lab coats should be worn. Launder or dry clean when soiled. When handling large quantities, impervious suits, and rubber boots must be worn. The use of Nitrile protective materials is recommended.

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Other Protection:
Other Notes:

IX. Physical and Chemical Properties

Property	Value	Unit	Condition	Unit	Condition
Freezing Point	325-525	Centiposes			
Boiling Point		Deg F			
Relative Density	Not Determined				
Vapor Pressure	<1	lb/in2(psia)	@ 100 Deg F		

Specific Gravity: 0.85
Bulk Density:
% Volatile:
Evaporation Rate:
State: Liquid
Odor: Petroleum Odor
pH: Not Applicable
Appearance: Bright and Clear liquid (Tax Diesels - pale red liquid)
Flash Point: 130 Deg F
Kinematic Vis: 1.2 cs @ 37.7 Deg C
Solubility in Water: Not Determined
Other Solubility:
Other Notes:

X. Stability and Reactivity

Stable:
Conditions to Avoid: Heat, Strong Oxidizers
Hazard Polymerization: Does not occur
Polymerization Conditions to Avoid:
Incompatibility:
Hazardous By-Product: Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.
Other Notes:

XI. Toxicological Information

Eye: (Draze) Similar product > 15.00 - 25.00 /10 (rabbit) slightly irritating.
Skin: (Draze) Similar product > .50-3.00/8.0 (rabbit) slightly irritating. LD50 Similar product > 2.00g/kg (rabbit) practically non-toxic.
Ingestion: LD50 Similar product >5.00g/kg (rat) practically non-toxic.

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Inhalation: Not determined

Chronic Effect:

Mutagenicity:

RTECS #:

Other Toxic

Effects:

Middle distillates have caused skin irritation and skin cancer in laboratory animals when repeatedly applied and left in place between applications. Studies to further evaluate the carcinogenic potential of middle distillates are currently underway. Kidney damage had also been observed in laboratory animals exposed to middle distillates.

Other Notes:

XII. Ecological Information

Ecotoxicological Information: Not determined

Chemical Fate Information: Not determined

Other Ecological Notes: Not determined

Other Notes:

XIII. Disposal Methods

Disposal

Methods:

This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitability.

Other Notes:

This product is potentially biodegradable.

XIV. Transportation Information

Proper Shipping

Name:

Fuel Oil

UN/NA #:

NA 1993

U.S. Customs

Harmonization #:

D.O.T.

Hazard Class:

Combustible Liquid

Reportable

Quantity:

See Section XV, CERCLA, for RQ listings.

Regulatory

References:

LAND TRANSPORT ONLY-49CFR 173.120(1)(2)

Label:

None

Packaging Group:

III

Placard:

Marking:

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I.M.O.

Hazard Class: Not evaluated
Marine Pollutant:
Regulatory References:
Label:
Packaging Group:
IMO Page:

I.C.A.O.

Hazard Class: Not evaluated
Regulatory References:
Label:
Packaging Group:

ADR:
RID:

Other Notes: This product contains a DOT Hazardous Substance or Substances, listed in Section XV, CERCLA of the MSDS. If the product's shipping container holds a reportable quantity, then the DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9.

XV. Regulatory Information

TSCA

Invent YES
ory:
5(a)(2)
5(h)(3)
12(b)

Exe
mpt:
5(e):
8(b):

Notes: This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Acute: YES **Chronic:** NO **Flammability:** YES **Pressure:** NO **Reactivity:** NO

Identity	TPQ	Reportable Quantity
None		

SARA 302 Notes:
SARA 311 Hazard Class: Yes

Identity	AS	% Weight
Benzene	71-43-2	0.01-0.09%

SARA 313 Notes:
SARA Notes:

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XVII. Plant Specific Information

Plant Spill Response:
Plant PPE:
Plant Emergency Response:

Other Notes:

MSDS Review Information

Entered By: _____ Date: 11/06/2001
Revised By: _____ Date:
Authorized By: _____ Date:

Effective January 1, 2004

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MATERIAL SAFETY DATA SHEET
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1. IDENTIFICATION OF THE SUBSTANCE/ PREPARATION

PRODUCT: XXXXXXXXXX HINDUSTAN PETROLEUM CORPORATION LIMITED
 PRODUCT CODE: 21243 17, JAMSHEDJI TATA ROAD,
 MSDS NO: 2-154-3 BOMBAY,
 DATE OF ISSUE: OCTOBER 1995 INDIA - 400 020
 STATUS: NEW

MEDICAL EMERGENCY
90 22 2618031

REVISION CHANGES

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredients present at or above 0.1 wt % (classified as toxic or very toxic) or 1 wt.% (classified as harmful, irritant or corrosive)

HAZARDOUS INGREDIENT	APPROXIMATE CONCENTRATION
----------------------	---------------------------

None

The chemical identity of some or all of the ingredients is confidential business information and is being withheld. In the event of a medical emergency, compositional information will be provided to medical staff.

3. HAZARD IDENTIFICATION

This product contains a highly refined base oil.

It is of low oral and dermal toxicity and under normal conditions of use should present no significant health hazards. However, in common with most mineral oils, prolonged and repeated skin contact may cause dermatitis.

Handling precautions should be strictly observed.

4. FIRST AID

INHALATION

At ambient/normal handling temperatures, inhalation of vapors is normally not a problem. If overexposed to oil mist, remove from further exposure. Administer artificial respiration if breathing is irregular or has stopped. Get prompt medical attention.

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MATERIAL SAFETY DATA SHEET
PAGE 2 OF 7

PRODUCT: ALPROL 400 HINDUSTAN PETROLEUM CORPORATION LIMITED

SKIN CONTACT:

No adverse effect due to skin contact are expected.

EYE CONTACT:

Rinse immediately with plenty of water until irritation subsides. If irritation persists, obtain medical advice.

INGESTION:

If swallowed, DO NOT induce vomiting; keep at rest and call a physician.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:

Foam, dry chemical powder, carbon dioxide.

FIRE AND EXPLOSION HAZARDS:

Combustible material, low hazard. The product can form flammable mixtures or can burn only on heating above the flash point. However, minor contamination by hydrocarbons of higher volatility may increase the hazard.

SPECIAL FIRE-FIGHTING PROCEDURES:

Water fog or spray, to cool fire-exposed surface (e.g. containers) and to protect personnel, should be used by personnel trained in fire fighting.

Cut off "fuel", depending on circumstances, either allow the fire to burn out under controlled conditions or use foam or dry chemical powder to extinguish the fire.

Respiratory and eye protection equipment required for fire fighting personnel exposed to fumes or smoke.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, and carbon monoxide may be formed in the event of incomplete combustion.

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MATERIAL SAFETY DATA SHEET
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PRODUCT APPROX 200

HINDUSTAN PETROLEUM CORPORATION LIMITED

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS : See Section 8.

LAND SPILL :

Shut off source taking normal safety precautions. Prevent liquid from entering sewers, water course or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation. Take measures to minimize the effects on ground water.

Recover by skimming or pumping using explosion-proof equipment, or contain spilled liquid with booms, sand, or other suitable absorbent and remove mechanically into containers.

If necessary, dispose of adsorbed residues as direct in Section 11.

WATER SPILL:

Confine the spill immediately with booms. Warn other shipping. Notify port and other relevant authorities.

Remove from the surface by skimming or with suitable absorbents. Disperse the residue in unconfined waters, if permitted by local authorities and environmental agencies.

7 HANDLING AND STORAGE:

Storage the product in cool, well ventilated surroundings, well away from source of ignition.

Provide suitable mechanical equipment for the safe handling of drums and heavy packages.

Electrical equipment and fitting must comply with local regulations regarding fire prevention with this class of product.

LOAD/UNLOAD TEMPERATURE, °C : Ambient to max. 60°C
STORAGE TEMPERATURE, °C : Ambient to max. 60°C

SPECIAL PRECAUTIONS :

Keep containers closed when not in use

Prevent small spills and leakages to avoid slip hazard.

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MATERIAL SAFETY DATA SHEET
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PRODUCT ALPROL 200 HINDUSTAN PETROLEUM CORPORATION LIMITED

8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMIT:

5 mg/m³ for oil mists (TWA, 8h - workday) recommended based upon the ACGIH TLV (Analyses according to US NIOSH Method 5026, NIOSH Manual of Analytical Methods, 3rd Ed.).

PERSONAL PROTECTION:

In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.

Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.

When concentration in air exceed the occupational exposure limit, and where engineering, work practices, or other means of exposure reduction are not adequate, approved respirators may be required.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE / ODOUR : CLEAR GOLDEN LIQUID, MILD PETROLEUM ODOUR.

DENSITY @ 29.5°C, g/ml (Average) : 0.885

BOILING RANGE : IBP 340°C (TYPICAL)

VISCOSITY, KINEMATIC @ 100°C, CST : 9.6 - 11.3

AIR/OUR DENSITY : GREATER THAN AIR

EVAPORATION RATE : SLOWER THAN N-BUTYL ACETATE

SOLUBILITY : SOLUBLE IN HYDROCARBON SOLVENTS, INSOLUBLE IN WATER

pH : NOT APPLICABLE

FLASH POINT, °C (COC) : 224 MINIMUM

AUTO-IGNITION TEMPERATURE : DATA NOT AVAILABLE

PARTITION COEFFICIENT n-octanol/water : DATA NOT AVAILABLE

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MATERIAL SAFETY DATA SHEET	
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PRODUCT ALPROL 210	HINDUSTAN PETROLEUM CORPORATION LIMITED
<p>10. STABILITY AND REACTIVITY</p> <p>STABILITY (THERMAL, LIGHT, ETC): Stable</p> <p>CONDITIONS TO AVOID:</p> <p>Keep away from heat source, open flames and other sources of ignition</p> <p>INCOMPATIBLE MATERIALS:</p> <p>Avoid contact with strong oxidants such as liquid chlorine and concentrated oxygen</p> <p>HAZARDOUS DECOMPOSITION PRODUCTS:</p> <p>Product does not decompose at ambient temperature.</p>	
<p>11. TOXICOLOGICAL INFORMATION</p> <p>EFFECTS OF OVER EXPOSURE:</p> <p>INHALATION:</p> <p>Negligible hazard at ambient/normal handling temperatures.</p> <p>Elevated temperatures or mechanical action may form vapours, mists, or fumes which may be irritating to the eyes, nose, throat, and lungs.</p> <p>Avoid breathing vapours, mists, or fumes.</p> <p>SKIN CONTACT:</p> <p>Low order of acute toxicity.</p> <p>Prolonged or repeated contact may lead to mild skin irritation.</p> <p>EYE CONTACT:</p> <p>Slightly irritating, but does not injure eye tissue.</p> <p>INGESTION:</p> <p>Low order of acute/systemic toxicity.</p>	
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MATERIAL SAFETY DATA SHEET
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PRODUCT ALPROL 200 HINDUSTAN PETROLEUM CORPORATION LIMITED

CHRONIC

Contains lubricating oil base stocks. Base oils of similar composition and refining history have exhibited no carcinogenic activity in laboratory animals.

TOXICITY DATA

ACUTE

No test data are available for this product. The potential health hazards were therefore derived from what is known of the toxicity of base oils in general. The general effects of base oils of this type are well known and are described in numerous publications including CONCAWE Report 5/87 "Health Aspects of Lubricants".

CHRONIC

Although there is no specific test data on the oil components, the base oils would not be expected to exhibit carcinogenic potential based upon what is known of the toxicity of base oils in general.

12. ECOLOGICAL INFORMATION

In the absence of specific environmental data for this product, this assessment is based on information for general hydrocarbon components found in lubricant mineral oils. Lubricant mineral oils, immediately following a release into the environment, will remain largely on the soil surface, and in water, will remain largely on the water surface. Based on chemical/physical information from the literature for this product category, no harmful effects to terrestrial or aquatic habitats would be expected. This product is expected to be resistant to biodegradation and to persist in the environment.

13. DISPOSAL CONSIDERATIONS

Collect and dispose of waste product at an authorised facility, in conformance with national and local regulations, and in accordance with EEC Directives on the disposal of waste oil.

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MATERIAL SAFETY DATA SHEET
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PRODUCT ALPROL 100 HINDUSTAN PETROLEUM CORPORATION LIMITED

14. TRANSPORT INFORMATION

USUAL SHIPPING CONTAINERS : Rail cns, tank trucks, drums.

TRANSPORT TEMPERATURE, °C : Ambient to max.60 C

15. REGULATORY INFORMATION

EC DANGEROUS SUBSTANCES/PREPARATIONS CLASSIFICATION :

Not Regulated

Refer to national legislation implementing the EC Directive 93/155/EC.

16. OTHER INFORMATION

PRODUCT TYPE / USES :

General purpose oils for use in printing ink, rubber and glass industry.

SOURCE OF KEY DATA :

The recommendations presented in this Material Safety Data Sheet were compiled from actual test data (when available), comparison with similar products, component information from suppliers and from recognised codes of goods practice.

The information and recommendations contained herein, to the best of knowledge of Hindustan Petroleum Corporation Limited are brief, accurate and reliable as of the date issued, but are offered without guarantee or warranty. They relate to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Conditions of use of the material are under the control of the user; therefore, it is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his particular use.

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MATERIAL SAFETY DATA SHEET (METHANE)

SECTION 1. PRODUCT IDENTIFICATION

Product Name- Methane Formula- CH₄

Chemical Name- Methane, Saturated Aliphatic hydrocarbon, Alkane, Synonyms- Marsh Gas, Fire damp, Methyl hydride.

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE LIMITS:

OSHA: None established **ACGIH:** Simple Asphyxiate **NIOSH:** None established

SECTION 3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Methane is a flammable, colorless, odorless, compressed gas packaged in cylinders under high pressure. It poses an immediate fire and explosion hazard when mixed with air at concentrations exceeding 5.0%. High concentrations that can cause rapid suffocation are within the flammable range and should not be entered.

EMERGENCY TELEPHONE NUMBERS

GGs-Control Room- 8348691430

ACUTE POTENTIAL HEALTH EFFECTS: ROUTES OF EXPOSURE:

EYE CONTACT: No harmful effect.

INGESTION: Not applicable

INHALATION: Methane is nontoxic. It can, however, reduce the amount of oxygen in the air necessary to support life. Exposure to oxygen-deficient atmospheres (less than 19.5 %) may produce dizziness, nausea, vomiting, loss of consciousness, and death. At very low oxygen concentrations (less than 12 %) unconsciousness and death may occur without warning. It should be noted that before suffocation could occur, the lower flammable limit for Methane in air will be exceeded; causing both oxygen deficient and an explosive atmosphere.

SECTION 4. FIRST AID MEASURES

EYE CONTACT: No treatment necessary.

INHALATION: Remove person to fresh air. If not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

SKIN CONTACT: No treatment necessary.

NOTES TO PHYSICIAN: Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT: AUTOIGNITION: FLAMMABLE RANGE:

-306 °F (-187.8 C) 999 °F (537 C) 5.0% - 15%

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, or water.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Evacuate all personnel from area. If possible, without risk, shut off source of methane, and then fight fire according to types of materials burning. Extinguish fire only if gas flow can be stopped. This will avoid possible accumulation and re-ignition of a flammable gas mixture. Keep adjacent cylinders cool by spraying with large amounts of water until the fire burns itself out. Self-contained breathing apparatus (SCBA) may be required.

SECTION 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate immediate area. Eliminate any possible sources of ignition, and provide maximum explosion-proof ventilation. Use a

flammable gas meter (explosimeter) calibrated for Methane to monitor concentration. Never enter an area where Methane concentration is greater than 1.0% (which is 20% of the lower flammable limit).

An immediate fire and explosion hazard exists when atmospheric Methane concentration exceeds 5.0%. Use appropriate protective equipment (SCBA and fire resistant suit). Shut off source of leak if

possible. Isolate any leaking cylinder. If leak is from container, pressure relief device or its valve, contact your supplier. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.

SECTION 7. STORAGE AND HANDLING

STORAGE: Store cylinders in a well-ventilated, secure area, protected from the weather. Cylinders

should be stored upright with valve outlet seals and valve protection caps in place. There should be no sources of ignition. All electrical equipment should be explosion-proof in the storage areas. Storage areas must meet National Electrical Codes for class 1 hazardous areas. Flammable storage areas must be separated from oxygen and other oxidizers by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire resistance rating of at least 1/2 hour.

Post "No Smoking or Open Flames" signs in the storage or use areas. Do not allow storage Temperature to exceed 125 F (52 C). Storage should be away from heavily traveled areas and emergency exits. Full and empty cylinders should be segregated. Use a first-in first-out inventory system to prevent full containers from being stored for long periods of time.

HANDLING: Do not drag, roll, slide or drop cylinder. Use a suitable hand truck designed for cylinder Movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Use a pressure reducing regulator to safely discharge gas from cylinder. Use a check valve to prevent reverse flow into cylinder. Never apply flame or localized heat directly to any part of the cylinder. Do not allow any part of the cylinder to exceed 125 F (52 C). Use piping and equipment adequately designed to withstand pressures to be encountered. Once cylinder has been connected to properly purged and inserted process, open cylinder valve slowly and carefully.

VENTILATION: Provide adequate natural or explosion-proof ventilation to prevent accumulation of gas concentrations above 1.0% Methane (20% of LEL).

RESPIRATORY PROTECTION:

Emergency Use: Do not enter areas where Methane concentration is greater than 1.0% (20% of the LEL). Exposure to concentrations below 1.0% does not require respiratory protection. **EYE PROTECTION:** Safety glasses and/or face shield.

SKIN PROTECTION: Leather gloves for handling cylinders. Fire resistant suit and gloves in emergency situations.

OTHER PROTECTIVE EQUIPMENT: Safety shoes are recommended when handling cylinders.

ODOUR AND STATE: Colorless, odorless, flammable gas.

MOLECULAR WEIGHT: 16.04

BOILING POINT (1 at): -258.7 °F (-161.5 C)

SPECIFIC GRAVITY (Air = 1): 0.554

FREEZING POINT / MELTING POINT: -296. 5 °F (-182.5 C):

SECTION 10. TOXICOLOGICAL INFORMATION LC50 (Inhalation):

Not applicable. Simple asphyxiant.

LD50 (Oral): Not applicable

LD50 (Dermal): Not applicable

SKIN CORROSIVITY: Methane is not corrosive to the skin.

ADDITIONAL NOTES: None

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES APPEARANCE, ODOR

HEALTH: = 1 HEALTH: = 0

FLAMMABILITY: = 4 FLAMMABILITY: = 4

REACTIVITY: = 0 REACTIVITY: = 0

SPECIAL: = SA*

SECTION 11. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: Not determined

MOBILITY: Not determined

PERSISTENCE AND BIODEGRADABILITY: Not determined

POTENTIAL TO BIOACCUMULATE: Not determined

REMARKS: This product does not contain any Class I or Class II ozone depleting chemicals.

SECTION 12. TRANSPORT INFORMATION DOT SHIPPING NAME:

Methane, compressed **HAZARD CLASS:** 2.1

IDENTIFICATION NUMBER: UN1971

SHIPPING LABEL(s): Flammable gas

PLACARD (When required): Flammable gas

CAUTION: Compressed gas cylinders shall not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of Federal law (49 CFR 173.301).

Section 13: Regulatory Information

SECTIONS 311/312: Hazardous Chemical Reporting (40 CFR Parts 370) IMMEDIATE HEALTH: Yes

PRESSURE: Yes

DELAYED HEALTH: No REACTIVITY: No

FIRE: Yes

SECTION 14. OTHER INFORMATION

NFPA RATINGS: HMIS RATINGS:

ANNEXURE 'E'

INFORMATION ON FIRE FIGHTING SYSTEM

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- A Central pump house with storage water tank (Fire Hydrant System) have been place in the plant with hose around all blocks to achieve maximum coverage. Water storage tank capacity is 275KL with feed from the supply water has been provided at highest point in the plant. Following are the details of the system.
- a. Water Reservoir storage Tank capacity is 275 KL.
 - b. Type of Hazard- Fire and Explosion
 - c. Classification of occupancy as per TAC - Ordinary Hazard occupancy as per Fire Protection Manual.
 - d. Automatic Operation -.Not available
 - e. Stand by arrangement - Fire extinguishers and water pumps with hydrant point and hoses.
 - f. No's of Hose Boxes- 95 No's
 - g. No's of Hoses-. 95 No's
 - h. Hydrant flexible rill- available
 - i. Main pump - Power-55KW, Head-80m, Capacity-171 m³/HR RPM-2965 Quantities -1, Diesel Pump-Power-68.6KW, Head-80m, Capacity-171m³/HR RPM-1800 Quantities -1 & Jokey Pump-Power-4.5KW, Head-98m, Capacity-10 m³/HR RPM-2890 Quantities -1
 - j. Other pumps- Mono bloc pumps installed at different location for fire fighting.
 - k. Pressure at farthest point 6-7 kg/cm² (New Extrusion) & Old plant is 7-10 kg/cm²
 - l. One foam making branch is there for producing foam at the time of emergency situation.
 - m. We have separate set of DG connection to give back up for operation of emergency equipment at the time of power cut. Necessary connection is given from that source for actual use in emergency.
 - n. Other arrangements are there for - 1) 185 KL of reserve water for prolonged fire fighting system in new extrusion; 2) 10 KL water reservoir in New RH-24 3) 5KL in Old PI 4) 5 KL in RH 16 section 5) 4 KL reservoir in T/Kiln.6) 5KL in old RH-24 7) 5KL in PI-2 and 8) 125KL in PI-4.
 - o. Spare pumps available in 1) new extrusion, 2) oil tank area 3) Old PI & 4) RH16 section.5)RH-24 6)ETP area. Along with this DG set system has extra added as an additional support for extinguishing fire at initial stage.
 - p.. Total Fire Hydrant Points-95 Nos. Fire Alarm & Smoke detector System- (PI-4, Acheson Rec#1&2-Heat detector)(Old extrusion-26 No.MCC Room,Adm Building, New Ext.MCC,PCC & Control Room-LWg4&5- control and Breaker Room, Tunnel kiln-PCC Room,Rh#section-2&3MCC-PCC room,Fin#4,MCC & Power pack Room.)
 - q. Multiple Fire Nozzle with Foam making Branch Available in Baking Department, Modular Fire Extinguishers are incorporate in Extrusion, Baking and Graphite department.
 - r. Four no's of Water monitor system has been placed in our plant.

s. Four no's area covered with water Sprinkler system.

t. Automated CO2 purging system have been placed in Record room with smoke detector & fire alarm.



ANNEXURE 'F'**EXISTING STOCK OF PPE's AT THE CUSTODY OF EMERGENCY PREPAREDNESS AND RESPONSE CENTRE FOR READY AVAILABILITY TO MEET UP EMERGENCY SITUATION**

<u>ITEM</u>	<u>NOS.</u>
Safety Helmet	50
Safety Goggles	100
Asbestos Gloves	02
Rubber Gloves	05
Eye Wash Fountain	08
Gum Boots	10
Safety Belt	05
Nose mask	150
Foam Making Branch	01
Electrical hand Gloves (33KV)	02
Face Shield	02
Ear plug	100
Hand Gloves	150
Breathing Apparatus set	01

ANNEXURE 'G'

EXISTING OVERALL STOCK OF PPEs AT VARIOUS DEPARTMENTAL LEVELS WITHIN THE PLANT PREMISES FOR READY AVAILABILITY TO MEET UP EMERGENCY SITUATION

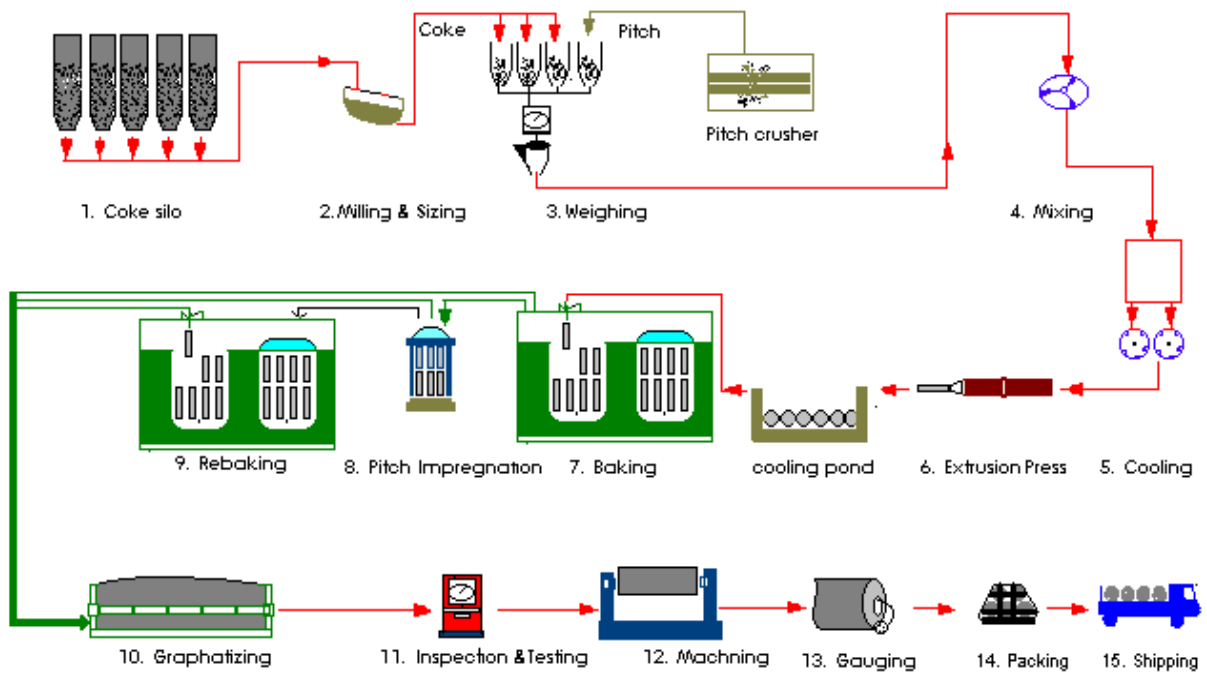
ITEM	NOS.
Safety Helmet	50
Safety Goggles	200(Minimum stock level)
Safety Shoes	(Provide to all contractor's employees)
Asbestos Gloves	20
Hand Gloves	3500(Minimum Stock level)
Rubber Gloves	40
Eye Wash Fountain	07(separate sheet attached for location)
Gum Boots	20(Minimum stock level)
Safety Belt	10
Electrical hand Gloves (33KV)	02
Nose Mask	800(Minimum stock level)
Fire proximity suit	02

ANNEXURE 'H'

FIRST AID MEDICAL FACILITIES.

- A. FULLY EQUIPED OCCUPATIONAL HEALTH CENTRE.
1. Doctor and Health attendant available.
- B. The company has provided "First –AID" boxes at security office, and all departments. Following are the contents of First aid Box.
1. Tincture iodine/ Lotion Merbromin
 2. Eye wash solution/Ciplox eye drop
 3. Burnol
 4. Soframycin (Ointment)/Betadine
 5. Sterilized cotton wool.
 6. Antiseptic Solution (Dettol)/Savlon
 7. Bandage.
 8. Paracetamol tablets.
 9. Leukoplast
 10. Pair of scissor.
- C. FIRST AIDER AT OHC - 1. S. A. Koshy, 2. S. Dolai
3. Shyamal Biswas
- D. List of First Aider available at respective department.
- E. The company has got its own transport facilities to take the injured to the hospital. The nearest hospitals are –
- 1) ESI HOSPITAL,
 - 2) BIDHANNAGAR S D HOSPITAL,
 - 3) VIVEKANANDA HOSPITAL
 - 4) MISSION HOSPITAL.
 - 5) GOURI DEVI HOSPITAL.

ANNEXURE I PROCESS FLOW CHART

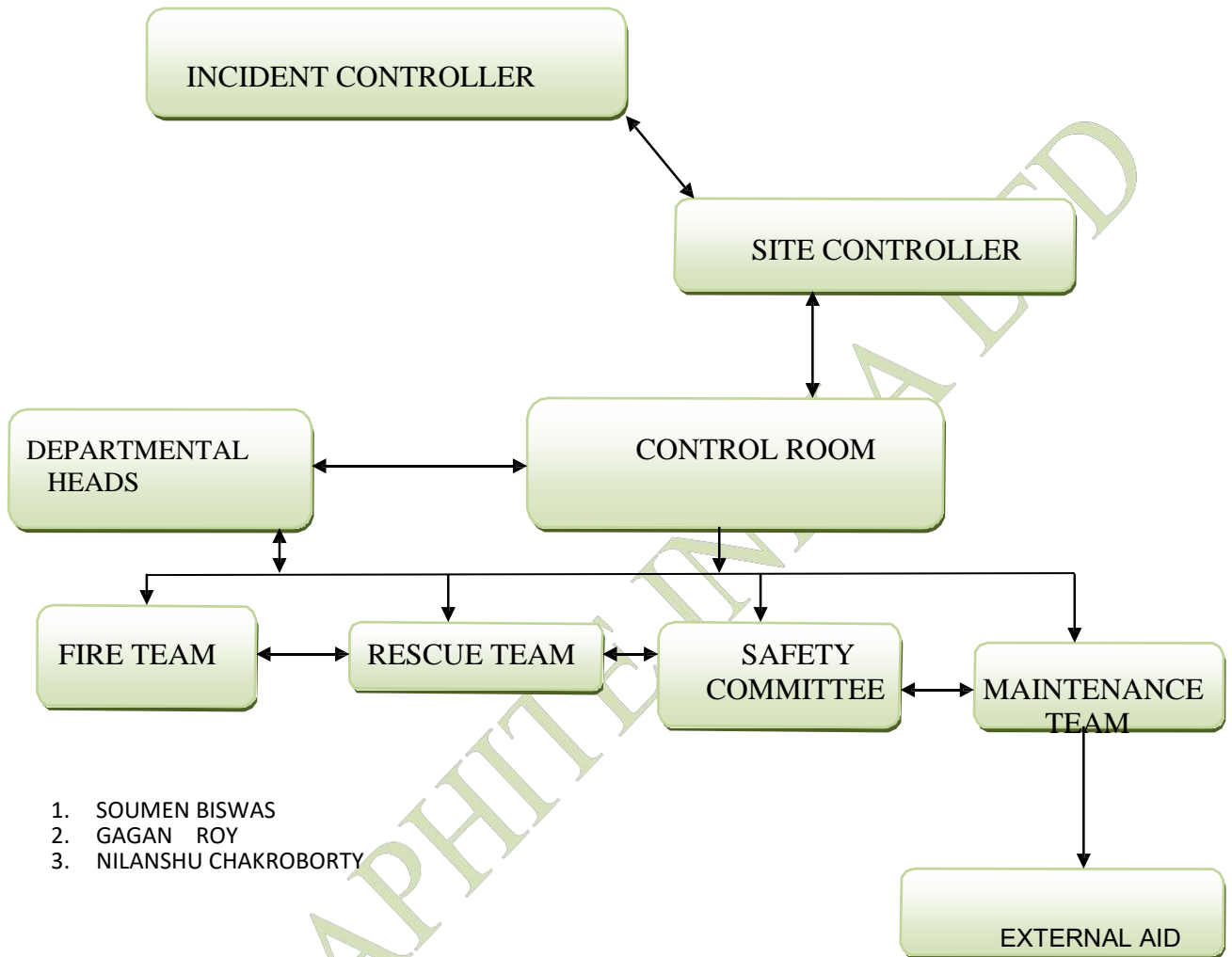


ANNEXURE J

LAYOUT OF SITE CIRCULATION PLAN WITH EMERGENCY PLAN.

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ANNEXURE K EMERGENCY ORGANIZATION CHART



Fire Co-ordinator : 1) PRADIP ROY PRATIHAR 2. SUDEV MOHANTA

ANNEXURE 'L' FIRE EXTINGUISHER List of Fire Extinguishers with Location

The company has trained personnel for fire fighting and its intends to improve the fire fighting skills of their employee by conducting training on Fire fighting. There are 355 portable fire extinguishers and Modular Fire Extinguishers the break-up of which is as under: -

Fire Extinguishers – Total - 355 nos.

THE DETAILS OF FIRE FIGHTING FACILITIES AVAILABLE IN GRAPHITE INDIA LIMITED ARE AS FOLLOWS:

Area		Security & CBM gas line S LPG Shed	Project office & New Project	Personnel & ADM	Ext (old)	Ext (New)	Baking	Graphite	Finishing & shipping	Main t .& store	New RH# 24	Fire Store	Total
Type of ext.	Capacity												
DCP	1KG			2									
DCP/ABC	5kG	6		1	7	18	24	3					
ABC	10/9-KG	1	5	1	8	25	36	23	9	2	18	4	
DCP	25KG						1	1					
DCP	50KG		1			1	5	1		1			
FOAM	9LITER		1		4	10	6	4	2		5	2	
FOAM	50LITER		1		2	3	5	1		1	2		
W/CO2	9LITER	1	2	2						3			
CO2	2KG	1		3			2	3				3	
CO2	3KG		1			1	1	2					
CO2	4.5KG		3			2	30	3	4		13	3	
CO2	6.5KG				2	2	3	2		1		1	
CO2	22.5KG						5	1					
DCP	150KG						2						
	TOTAL	9	14	9	23	62	120	44	15	8	38	13	355

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Annexure-M

FIRE FIGHTER LIST

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	<u>EXTRUSION</u>		<u>BAKING</u>		<u>FINISHING</u>		<u>PERSONNEL</u>
1	Manik Mondal	48	Risav Pandey	94	Partha Pratim Ghosh	134	Tarak Nath Banerjee
2	Kartick Samanta	49	Sk Aktar	95	Arunavo Mondal	135	Sudiptyo Banerjee
3	Dilip Shit	50	Santanu Pal	96	Arindom Sarkar	136	Kamal Chaudhary
4	Dineshwar Rai	51	Sudipto kanti Roy	97	Abihijit Chatterjee	137	Sadananda Mukherjee
5	Mahendra Das	52	Abijit Agasti		<u>SHIPPING</u>	138	Ayoan Banerjee
6	Hadish Ansari	53	Raju Ram.	98	Santanu Guha		<u>PLANNING</u>
7	Swapn Das	54	Samir Das	99	Niloy Sen	139	Subrato kumar Routh
8	Prabodh kurmi	55	Snehasis Sarkar	100	Soumen Roy	140	Souvik Banerjee
9	Binod das	56	Rajkishore Roy	101	Tatar Chakroborty	141	Biswajit Ghosh
10	Md. Inamul	57	Balaram Chakroborty	102	Bikash upadhyay	142	Deb Dulal Choubey
11	Joydev Dhibor	58	Saikat Mishra	103	Anuj Sarkar		<u>PROCESS</u>
12	Gopal Ghosh	59	Pritam Paul		<u>INSPECTION</u>	143	Hemnath halder
13	Paran Roy	60	Indrajit Nandi	104	Prasenjit Nandi	144	Dibyendu Das
14	Pritish Nandi	61	Anindya Mukhejee	105	Joydeep Mazumder	145	Swapn Satra
						146	Madhumoy Das
15	Chandrasekhar singh	62	Ranjit Singh	106	Soumen Mukherjee		<u>BY-PRODUCT</u>
16	Arko banerjee	63	Rajdip Debnath	107	Anup Maity	147	Shyamal Mazumder
							<u>CENTRALPLANNING</u>
						148	<u>Silchan Sarkar</u>
17	Sk Akthar Ali	64	Rajat banerjee	108	Tushar kr. Singha Roy		<u>MAINTENANCE</u>
18	Prabakar Saha	65	Anindhya sundar bera	109	Saikat Das	149	Ashwini Shit
19	L.D. Prasad	66	Biprajit Ghosh	110	Soham Chattaraj	150	Lakshmipada Das
20	Chunchun Rajak	67	Priyak Saha	111	Anjan Sarkar	151	Arun Routh
21	Parichoy Mistry	68	Babaruddin shek	112	Ratan Dutta	152	Manoj Sahani
22	Pravakar Saha	69	Anupam Muhkerjee	113	Biren Singh	153	Sukanta Ghosh
23	Arjun Mondal	70	Rajesh Palit	114	Anupam Mukhopadhyay	154	Kajal Kundu
24	Janak Das	71	Biswajit Dey	115	Rajib Saha	155	Tapan Mallick
	<u>BAKING</u>	72	Mainak Sarkar	116	Chittabrata Sinha	156	Anirban Chatterjee
25	Joyanta Konar		<u>GRAPHITE</u>	117	Amit Mitra		

FIRE FIGHTER LIST

	<u>BAKING</u>		<u>GRAPHITE</u>		<u>INSPECTION</u>		<u>MAINTENANCE</u>
26	Sandip Jadav	73	Subhas Dhibar	118	Nirmalya Banerjee	157	Jackie Kumar
27	Dinesh Thakur	74	Sk.Amzad	119	Sourav Maji	158	Pranab Satra
28	Gopal Ram	75	Udai Bauri	120	Nilkamal De	159	Anil kumar Sit
29	Sisir Patra	76	Bistu Bauri	121	Prasanta Das	160	Pradip Singha
30	Subhodeep Mondal	77	Mustak Ahemed Mondal	122	Saikat Das	161	Sagar kumar Niogi
31	Ujjal Mal	78	Sudipta Das		<u>LABORATORY</u>	162	Abijit Konar
32	Tanmoy Saha	79	Dipendu Mistri	123	Debayan Dey	163	Mohanlal Saha Roy
33	Sk. Mustafa	80	Manoj kumar Bharti		<u>STORE</u>	164	Proloy Sarkar
34	Ashok Tanti	81	Chatu Mahato	124	Sheetal Rajak	165	Sukanta Pal
35	Haradhon Akuli	82	Mitunjoy Ghosh	125	Nilandri Banerjee	166	Manoj Singh
36	Rakesh Pandey	83	Jagannath Debnath		<u>PROJECT</u>	167	Mihir Kumar Dey
37	Amit kr. Roy	84	Subhankar Bhattacharjee	126	Jhantu kumar Mondal		<u>SECURITY</u>
38	Bablu Das	85	Bachan Akure	127	Ram Baran Sharma	168	Lambunath Dey
39	Dilip Bayen	86	Sk. Rabiul	128	Rajib Sengupta	169	Dilip Sarkar
40	Sk.Nausad		<u>FINISHING</u>	129	<u>Purchase</u> -Sourav Singha	170	S. Biswas
41	Dibas Chatterjee	87	Ashim Bakshi	130	Joshep Mondal	171	Aditya Banerjee
42	Swapn Roy	88	Dinesh Pramanik	131	Piyush Trivedi	172	Bijoy Ghosh
43	Ashoke Dhara	89	Arunava Mondal	132	Sandip Nandi Roy		Accounts
44	Rabin Panda	90	Amit Kumar Hazra			173	Somnath Mitra
45	Sk.Paswan	91	Prasenjit Dey			174	Asish Kumar Bhandawat
46	Nukul Akure	92	Manas Samanta		<u>CSD</u>	175	Prabir Singha
47	Swapn Nandi	93	Soumendu Dasgupta	133	Nilanjan Das		
						TOTAL	175

Work permit system exists in our organization and a copy of the same is attached below as Annexure–N in the "ON SITE EMERGENCY PLAN".



PLANT: GRAPHITE INDIA LIMITED

Permit No. (Maintained by Department Head, Working site & Safety Dept.)

GID-SAF-F006 R2 W.E.F. 10.12.2022

PERMIT TO WORK

(Ensure Work Permit are fully filled & completely understood.)

Work Activity (tick applicable)	Hot Work	Working at Height	Confined Spaces	Excavations	Lifting Activity	Electrical	Scaffolding Erection & Dismantling
A. Application (to be completed by Contractor/ GIL Maintenance personnel or Operators)							
Requesting Company:		Request by:		Date:			
Location of Work:		Description of Work:					
Permit is required		Time	Date	To:	Time	Date	
From:							
B. General Precautions/ Checklist prior to commencement and during the work							
Safety Equipment to be used:							
Helmet <input type="checkbox"/>	Safety Shoe <input type="checkbox"/>	Safety Goggles <input type="checkbox"/>	Ear Plugs/ Muffs <input type="checkbox"/>	Hand Glove <input type="checkbox"/>			
Apron <input type="checkbox"/>	Safety Net <input type="checkbox"/>	Dust/ Gas Musk <input type="checkbox"/>	Safety Belt/ Harness <input type="checkbox"/>	Gum Boots <input type="checkbox"/>			
C. Other Precautions / Special Instruction:							
(4) State of Isolation (Electrical, Solid, Gas, Vapor, Fuel, Solid, Air, Nitrogen)	No. of lines	Depressurized & Drained	Positive Isolation	Tagged Off	Valve Only	Initials as applicable	Not Isolated
(b) All Motive Power has been isolated and any logic control interrupted (LOCK/ TAG)	YES , Lock # Tag #		NO		N/A		
(c) Electrical fuses have been withdrawn & all circuits are dead, Sign .....(Electrical Engg) Date.....Time.....							
(5) (a) CONFINED SPACE ENTRY (Cancelled if not required) O2 % ; System Isolated :(Y/N/NA) ; Rescue System .....(Y/N/NA) CS Attendant .....(Y/N/NA) Name, Register for entry & exists.....(Y/N/NA) Any other gas .....ppm And is therefore safe to enter from .....Hrs to Hrs on dt..... Sign..... (Approved Signatory)							
D. Permit Authorisation							
Permission is given for the work to proceed subject to the conditions specified above.							
Name Issuer :	Date/ Time :		Signature :				
Dept. Head : (Dept. Head where work is done.)	Date/ Time :		Signature :				
Safety Officer :	Date/ Time :		Signature :				



(Cross Check By)							
E. Permit Acceptance (to be completed by contractor)							
I certify that have read and understood this permit and that work will be carried out in accordance with its requirements. Persons whose names are recorded on the permit shall be working under me.							
Name of Contractor/ Supervisor :		Signature :			Date/ Time :		
F. Name of Employee on the Job with ESI No. & Signature:							
Name of Employee	ESI No.	Signature	Name of Employee	ESI No.	Signature		
1.			6.				
2.			7.				
3.			8.				
4.			9.				
5.			10.				
G. Extension of Permit:							
PTW Authorization	Weekly Extension Permit						
	Day 1/Shift	Day 2/Shift	Day 3/Shift	Day 4/Shift	Day 5/Shift	Day 6/Shift	Day 7/Shift
Supervisor Name							
Signature.							
Engineer Name							
Signature							
H. Completion of work (to be completed by contractor)							
I hereby declare that all work for which this permit was issued has been completed, all personnel under my control have been withdrawn and the work is and any associated equipment have been kept in a safe condition.							
Name of Contractor/ Supervisor :		Signature :			Date/ Time :		
Name of Engg./ Officer :		Signature :			Date/ Time :		



<p>1. Hot Work (Welding, Grinding, Cutting)</p> <p><u>Precautions Taken</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Flammables / Combustibles (paper, rags, wood, etc.) protected <input type="checkbox"/> Fire Watch Established Welding & Cutting equipment positioned properly <input type="checkbox"/> Cables / Hoses routed over the ground and do not pose a tripping hazard <input type="checkbox"/> Area hazards reviewed <input type="checkbox"/> Electrical connections through ELCB of 30 mA sensitivity <input type="checkbox"/> Electrical equipment's are free from damage and earthed properly <input type="checkbox"/> Performer/s are competent and equipped with appropriate PPEs i.e. including face shield With adequate shade number /welding goggles/ apron, safety shoes etc. <input type="checkbox"/> No tampering / manipulation attempted in safety device of the equipment's <input type="checkbox"/> Only industrial type electrical appliances are in use <input type="checkbox"/> Cables / fuses are of adequate size & capacity fit with the requirement <input type="checkbox"/> Hoses are free from damage and connected with Jubilee clamp. <input type="checkbox"/> No cable joint within 1 Mtr. from the holder / grinding machine and completely insulated from with M/C body <input type="checkbox"/> Gas cylinders used: Oxygen / Industrial LPG / Dissolved Acetylene <input type="checkbox"/> Gas cutting torch of reputed make, ISI marked, installed with NRV / 3 way torch and / or Flash back arrestors are in use. <input type="checkbox"/> Regulator pressure gauges in working condition, visible and not damaged. <input type="checkbox"/> Welding cable and earthing cable are crimped with proper size lugs. <p>Fire Protection</p> <p><u>Precautions Taken</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Combustible gas or liquid containers removed <input type="checkbox"/> Area wet down <input type="checkbox"/> Spark / Spatters shields / Ceramic Cloth installed / used. <input type="checkbox"/> Other (explain) _____ <p>Equipment's Provided</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fire extinguishers Type: <input type="checkbox"/> CO2 <input type="checkbox"/> Dry Chemical Powder <input type="checkbox"/> Other _____ Size _____ Quantity _____ <p>2. Excavations Exceeding 1 m (3 ft.)</p> <p><u>Precautions Taken</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Contractor has a competent person assigned to inspect & control condition of excavation on site <input type="checkbox"/> Underground utilities identified <input type="checkbox"/> Power equipment grounded <input type="checkbox"/> Electrical or mechanical overhead clearances checked <input type="checkbox"/> Hard / Soft Barricades, area warning placed <input type="checkbox"/> Means of egress (ladder or steps) placed <input type="checkbox"/> Side walls shored or laid back <input type="checkbox"/> Area adequately lighted <input type="checkbox"/> Material or soil removed from excavation edge <input type="checkbox"/> Excavator is fit for the job <input type="checkbox"/> Banksman provided to guide the operator <input type="checkbox"/> Method of dewatering is established and ensured the stoppage of water return <input type="checkbox"/> Excavated pit edges free from heavy over-burden, stack of materials <input type="checkbox"/> People are prevented from working inside pits if heavy vehicle movement in the vicinity due to which soil collapse may take place. <p>3. Height Work (More Than 1.8 M High) Contractor procedure in place: Y / N</p> <p><u>Precautions Taken</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Only medically fit personnel engaged in work and list is available. <input type="checkbox"/> Ladder(s)/ Approach way inspected prior to use <input type="checkbox"/> Ladder properly supported and leveled <ul style="list-style-type: none"> <input type="checkbox"/> Tied Top <input type="checkbox"/> Tied Bottom <input type="checkbox"/> Distance between the ladder support and the ladder base is at least ¼ the total length of the ladder <input type="checkbox"/> Ladder been provided with skid resistant feet <input type="checkbox"/> Scaffolds/platforms inspected for good repair and proper construction (secured flooring and guardrails) <input type="checkbox"/> Ladder been provided with skid resistant feet <input type="checkbox"/> Work area roped off and warning signs in place <input type="checkbox"/> Proper Housekeeping is done <input type="checkbox"/> Personnel assigned to warn of floor opening or other hazardous exposure/opening covered. <input type="checkbox"/> Tools and other equipment stored in safe manner <input type="checkbox"/> Area cleared below prior to starting work <p><u>Equipment Provided</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Full body Safety Harness with double lanyard and anchored to independent rigid object <input type="checkbox"/> Lifeline with rope grab shock absorber/fall arrestor <input type="checkbox"/> Safety net is provided but not less than 5 M from the work area / NA. <input type="checkbox"/> Reflective safety jacket to be used while working on height 	<p>4. Lifting Activity & Critical Rigging.</p> <p><u>Precautions Taken</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Safety devices of the lifting appliances are inspected before use <input type="checkbox"/> Operator qualified and medically fit including eye sight examined by authority <input type="checkbox"/> Lifting appliances are certified by competent authority and labeled properly. <input type="checkbox"/> Hoist chain or hoist rope free of kinks or twists and not wrapped around the load. <input type="checkbox"/> Lifting Hook has a Safety Hook Latch that will prevent the rope from slipping out. <input type="checkbox"/> Lifting gears operator been instructed not to leave the load suspended <input type="checkbox"/> Electrical power line clearance (12ft) checked <input type="checkbox"/> Signal man identified <input type="checkbox"/> Outriggers supported, Crane leveled <input type="checkbox"/> Load chart available in the crane <input type="checkbox"/> Barrier Installed <input type="checkbox"/> Riggers are competent <input type="checkbox"/> Slings are inspected for free from cut marks, pressing, denting, bird caging, twist, kinks or core protrusion prior to use. <input type="checkbox"/> Slings mechanically spliced (Hand spliced slings may not be allowed) <input type="checkbox"/> D / Bow shackles are free from any crack, dent, distortion or weld mark, wear / tear <input type="checkbox"/> Special lift as per erection / lift plan <input type="checkbox"/> Job Hazards is explained to all concern thru tool box talk meeting <input type="checkbox"/> Guide rope is provided while shifting / lifting the load. <p>5. Electrical Work</p> <p><u>Precautions Taken</u></p> <p>LIVE ELECTRICAL WORK CAN BE PERFORMED BY LICENCED ELECTRICIAN ONLY</p> <ul style="list-style-type: none"> <input type="checkbox"/> Power supply locked and tagged <input type="checkbox"/> Circuit checked for zero voltage <input type="checkbox"/> Portable cords and electric tools inspected <input type="checkbox"/> Safety back-up man appointed <input type="checkbox"/> Physical isolation is ensured If yes, State the method <input type="checkbox"/> In case of lock applied, ensure the safe custody of the key by putting it in group lock. <input type="checkbox"/> If physical isolation is not possible state the alternative method of precaution/isolation. <input type="checkbox"/> Stored energy discharged through discharge rod. <input type="checkbox"/> 3 way power tester is available for testing live system, <input type="checkbox"/> Electrical shut down to follow LOTO. <p><u>Equipment Provided</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Approved rubber and leather gloves <input type="checkbox"/> Insulating mat <input type="checkbox"/> Fuse puller <input type="checkbox"/> Disconnect pole or safety rope <input type="checkbox"/> Non-conductive hard hat <input type="checkbox"/> Earth Leakage Circuit Breaker (ELCB) <input type="checkbox"/> Cool Coat , suitable power resistant shoes, gloves <p>6. Scaffolding Erection & Dismantling:</p> <p><u>Precautions Taken</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Presence of competent person assigned to ensure safe erection, maintenance, or modification of scaffolds. <input type="checkbox"/> Scaffolds inspected for proper access, egress by competent persons. <input type="checkbox"/> All pipes, clamps, H-frames, couplers, boards checked before assembly <input type="checkbox"/> Standard guardrail (1050mm top rail, 500 mm mid-rail, and 150 mm toe board) been used whenever possible. <input type="checkbox"/> Platforms, walkways on scaffolds are wide of minimum of 600 mm wherever possible <input type="checkbox"/> Precautions taken to ensure scaffolds are not overloaded <input type="checkbox"/> Overhead protection provided where there is exposure <input type="checkbox"/> No opening / Gap in the platform / walkway. <input type="checkbox"/> All component of the scaffold more than 12' away from any exposed power lines <p>7. Confined Space & maintenance work at refractory wall</p> <ul style="list-style-type: none"> <input type="checkbox"/> The written confined-space entry program is firmly implemented and being enforced. <input type="checkbox"/> Is there a qualified stand-by man deputed? <input type="checkbox"/> Does he maintain a list of personnel entries with sign and date/time of entry? <input type="checkbox"/> Gas / Oxygen deficiency test done. <input type="checkbox"/> Are only 24V hand lamps used inside the vessel? <input type="checkbox"/> Proper means of exit provided. <input type="checkbox"/> Proper ventilation and lighting provided <input type="checkbox"/> Fall arrester used in case of maintenance work at height <input type="checkbox"/> Confined space is adequately cleaned, ventilated and lightened. <input type="checkbox"/> Confined space has been isolated from all energy & connected Pipelines.
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Emergency Cell no.: Mr..... (), Mr. (), Mr. ()
 Safety officer Contractor Dept. Head



ANNEXURE P

First Aiders Name List

R7

Sl. No.	Name	Designation	Department
1	Mr. Somenath Mitra	Sr. Officer	Accounts
2	Mr. Vikash Jha	Dy. Engineer	Baking
3	Mr. Biswanath Datta	Engineer	Baking
4	Mr. Tanmay Saha	Engineer	Baking
5	Mr. Monojit Mukerjee	Asst. Engineer	Baking
6	Mr. Anupam Mukherjee	Engineer	Baking
7	Mr. Sumit Koner	Asst. Engineer	Baking
8	Mr. Subhagata Das	Engineer	Baking
9	Mr. Nayan Mondal	Asst. Engineer	Baking
10	Mr. Balaram Chakraborty	Dy. Engineer	Baking
11	Mr. RUDRANATH ROY	Dy. Engineer	Baking
12	Mr. Tapas Pal	Asst. Engineer	Baking
13	Mr. PRASANTA GOPE	Loader	Baking
14	Mr. U.K.BAHAL	Helper	Baking
15	Mr. DAYAMOY DUTTA	Loader/Helper	Baking
16	Mr. TANMOY SARKAR	Macber Operator	Baking
17	SEKH RAJESH	FT Driver	Baking
18	Mr. SHYAMAPADA BOURI	Loader	Baking
19	Mr. SUSANTA ROY	loader helper	Baking
20	Mr. KUNTAL SARKAR	Loader/Crane Operator	Baking
21	Mr. Manoj Bhui	Helper	Baking
22	Mr. RISUV KUMAR PANDEY	FT Driver	Baking
23	Mr. SUMAN JOSH	PI Loader	Baking
24	Mr. JOGEN BAURI	PI Loader	Baking
25	Mr. BIKASH KUMAR BARIK	PI OPERATOR	Baking
26	Mr. BISWAJIT GUPTA	PI Loader	Baking
27	Mr. SWARUP MITRA	Loader	Baking
28	MD. KALAM	Helper	Baking
29	MD. Dilawar	FL Helper	Baking
30	Mr. ARUP KUMAR BHOUMIK	Charge Operator	Baking

31	Mr. Dilip Sikdar	Helper	Baking
32	Mr. Tapan Bhui	FL Helper	Baking
33	Mr. NAREN ROY	Loader	Baking
34	Mr. Bishnupada Ankure	Helper	Baking
35	Mr. Deep Roy	Helper	Baking
36	Mr. RANA GHOSH	Loader/Crane Operator	Baking
37	Mr. Indrajit Nandi	Engineer	Baking
38	Mr. Partha Lodh	Dy. Engineer	Baking
39	Mr. Somnath Bera	Dy. Engineer	Baking
40	Mr. Rajkumar Dutta	Asst. Engineer	Baking
41	Mr. Subhradeep Mondal	Engineer	Baking
42	Miss. Sharmistha Dey	Helper	Balaji Foods
43	Miss. Sounami Chatterjee	Dy. Officer	ESG
44	Mr. ANANDAMOY PATRA	Press Operator	EXTRUSION
45	SK. SAMSUL HUDA	Miller Operator	EXTRUSION
46	Mr. PRABHAKAR SAHA	Crane Operator	EXTRUSION
47	SK. AKHTAR ALI	Floorman	EXTRUSION
48	Mr. SAMRAT CHATTOPADHYAY	Asst. Engineer	EXTRUSION
49	Mr. BAPPA ROY	Press Operator	EXTRUSION
50	Mr. GOPAL GHOSH	Press Operator	EXTRUSION
51	Mr. CHUNCHUN RAJAK	Tank Man	EXTRUSION
52	Mr. Dilip Shit	Miller Operator	EXTRUSION
53	Mr. Arka Bikash Banerjee	Engineer	EXTRUSION
54	Mr. Sanjib Nandi	Dy. Engineer	EXTRUSION
55	Mr. Sudin Chakraborty	Dy. Manager	Finishing
56	Mr. Manas Samanta	Dy. Manager	Finishing
57	Mr. Arindam Sarkar	Sr. Engineer	Finishing
58	Mr. Amish Paul	Dy. Engineer	Finishing
59	Mr. Sanjoy Mondal	MC operator	Finishing
60	Mr. Pradeep Paul	Machine Operator	Finishing
61	Mr. Joy Singh	Machine Operator	Finishing
62	Mr. Subham Banerjee	Asst. Engineer	Finishing
63	Mr. Arindam Sana	Machine Operator	Finishing
64	Mr. Prasenjit De	Sr. Engineer	Finishing
65	Mr. Dinesh Pramanik	Sr. Engineer	Finishing
66	Mr. PARIMAL BOSE	Engineer	Graphite
67	SK TASLIM AKHTER	Dy. Engineer	Graphite
68	Mr. ANIMESH PURKAIT	Dy. Engineer	Graphite

69	Mr. SHAHID ALI	Engineer	Graphite
70	Mr. SANJIB GHOSH	Asst. Engineer	Graphite
71	Mr. SUMANTA KONAR	Asst. Engineer	Graphite
72	Mr. DIBYAYAN CHAKRAVORTY	Asst. Engineer	Graphite
73	Mr. SOURAV RUDRA	Asst. Engineer	Graphite
74	Mr. KOUSHIK JOSH	Dy. Engineer	Graphite
75	Mr. SAIKAT MONDAL	Asst. Engineer	Graphite
76	Mr. RAJIB BANERJEE	Asst. Engineer	Graphite
77	Mr. RAJEEB MAHATO	Asst. Engineer	Graphite
78	Mr. BIKRAM DAS	Asst. Engineer Trainee	Graphite
79	Mr. AJOY DHAR	Asst. Engineer Trainee	Graphite
80	Mr. PALLAB DAS	Fitter Helper	Graphite
81	Mr. PROMOD KR. ROY	FT Driver	Graphite
82	Mr. SURESH PROSAD	FT Driver	Graphite
83	Mr. MIHIR SAMAL	FT Driver	Graphite
84	Mr. CHATU MAHATO	Loader/Crane Operator	Graphite
85	Mr. Sk. Julfikar	F.T Helper	Graphite
86	Mr. Priya Ranjan Acharya	Asst. Manager	Graphite
87	Mr. Alok Maji	Sr. Engineer	Graphite
88	Mr. Monoranjan Jash	Inspector	Inspection
89	Mr. Sudip Ghosh	Inspector	Inspection
90	Mr. Ramkrishna Jha	Dy. Engineer	Inspection
91	Mr. Anjan Sarkar	Sr. Engineer	Inspection
92	Mr. Arup Saha	Inspector	Inspection
93	Mr. SANTOSH BANERJEE	Inspector	Inspection
94	Mr. AVIJIT CHAKRABORTY	Helper	Inspection
95	Mr. SHYAMAL PAL	Engineer	Inspection
96	Mr. SAURAV MAJI	Sr. Engineer	Inspection
97	Mr. AJAY CHAKRABORTY	Inspector	Inspection
98	Mr. MANAS SUTRADHAR	Inspector	Inspection
99	Mr. TUSHAR SINHA ROY	Dy. Engineer	Inspection
100	Mr. BIREN SINGHA	Dy. Engineer	Inspection
101	Mr. PRASENJIT NANDI	Sr. Engineer	Inspection
102	Mr. Milan Kanti Ghosh	Inspector	Inspection
103	Mr. Saikat Das	Dy. Engineer	Inspection
104	Mr. Ram Narayan Mahanta	Helper	Inspection

105	Mr. Azhar Khan	Helper	Inspection
106	Mr. Uttam Ankuli	Lab	Lab
107	Mr. Debayan Dey	Dy. Officer	Laboratory
108	Mr. Sujay banerjee	Asst Manager	Maintenance
109	Mr. Sourv Mukherjee	Manager	Maintenance
110	Mr. Surojit Das	Engineer	Maintenance
111	Mr. Indronil Dey	Sr. Engineer	Maintenance
112	Mr. Nupur Mondal	Sr. Engineer	Maintenance
113	Mr. Pallab Mukherjee	Asst. Manager	Maintenance
114	Mr. Sayan Chatterjee	Dy. Engineer	Maintenance
115	Mr. Sagar Neogi	Dy. Engineer	Maintenance
116	Mr. Sudipta Banerjee	Boiler operator	Maintenance
117	Mr. Partha Mukherjee	Electrician	Maintenance
118	Mr. Mansoon katre	Asst. Manager	Maintenance
119	Mr.Sudutta chatterjee	Manager	Maintenance
120	Mr. Amitava Nandi	Asst. Manager	Maintenance
121	Mr. Aritra Nandi	Asst. Manager	Maintenance
122	Mr. Subhra kanti hazra	Dy. Manager	Maintenance
123	Mr.Debmalya Mitra	Dy. Engineer	Maintenance
124	Mr. Tapan Mallick	Fitter	Maintenance
125	Mr.Tapan Roy	Electri Helper	Maintenance
126	Mr. Ujjwal Ankure	Asst. Engineer	Maintenance
127	Mr. Sudip Mitra	Dy. Engineer	Maintenance
128	Mr. Sukanta Pal	Engineer	Maintenance
129	Mr. Pradip Kr. Singha	Engineer	Maintenance
130	Sk. Ashif	Engineer	Maintenance
131	Mrs. Tinku Banerjee	General Asst.	Medical
132	Mrs. Dola Roy	Clerk	Medical
133	Mrs. Madhumita Munshi	Clerk	Medical
134	Mr. Sovan Dolai	Compounder	Medical
135	Mr. Shyamal Kr. Biswas	Compounder	Medical
136	Mr. Shibu Andrews Koshy	Compounder	Medical
137	Mr. Tarak Nath Banerjee	Officer	Personnel
138	Mr. Sanat Adhikary	Sr. Officer	Planning
139	Mr. Biswajit Ghosh	Officer	Planning
140	Mr. Shankar Kotal	Dy. Engineer	Process

141	Mr. Rajib Sengupta	Officer	Projects
142	Mr. Sourav Sinha	Engineer	Purchase
143	Mr. Pradip Roy Pratihar	Sr. Officer	Safety
144	Mr. Sudev Mohanta	Manager	Safety
145	Mr. BEJOY GHOSH	Asst. Security Officer	SECURITY
146	Mr. LAMBU NATH DEY	Asst. Security Officer	SECURITY
147	Mr. Protim Das	Asst. Officer	SECURITY
148	Mr. Anuj Sarkar	Sr. Engineer	Shipping & Yard
149	Mr. Tatar Chakraborty	Engineer	Shipping & Yard
150	Mr. Niloy Sen	Officer	Shipping & Yard
151	Mr. Sib Shankar Bit	Loader/ Packer	Shipping & Yard
152	Mr. Uttam Bauri	Loader Packer	Shipping & Yard
153	Mr. Hare Ram Singh	Crane Operator	Shipping & Yard
154	Mr. Ramiz Raja Biswas	Helper	Shipping & Yard
155	Mr. Rajesh Palit	Dy. Engineer	Shipping & Yard
156	Mr. Soumen Roy	Dy. Manager	Shipping & Yard
157	Mr. Niladri Sekher Banerjee	Officer	Stores
158	Mr. Nikhil Bandhu Pal	Sr. Officer	Systems

Annexure-Q

Background:

The nation is passing through a pandemic situation. Central Government and Government Of West Bengal have issued various orders to combat COVID-19. During this challenging time Graphite India Ltd has taken up several initiatives which helped in better monitoring and Sustenance of Plant operations as well as COVID-19 containment to ensure wellbeing of its Employees

- 1) **Purpose:** The purpose of these guidelines are to ensure that the chain of **COVID19** spread is eliminated at our workplace and all works can be done safely. These measures are to be ensured at all GRAPHITE INDIA establishments so that employees, associates, customers, suppliers, transporters, visitors feel safe and secure at our work place.

- 2) **Scope:** These guidelines apply to all GRAPHITE INDIA establishments
 - Manufacturing units
 - Guest Houses / Labour Colony

- 3) **Coverage:** This SOP covers all stakeholders working at GRAPHITE INDIA Premises
 - All GRAPHITE INDIA Employees
 - All Associates & Contract Workmen
 - All Trainees
 - All Customers visiting GRAPHITE INDIA premises
 - All Suppliers / Transporters entering GRAPHITE INDIA premises
 - All Visitors to GRAPHITE INDIA premises

.Standard Operating Procedure for Social Distancing for Offices and Workplaces in Graphite India Limited, Durgapur as per order of MHA

Dated 15.04.2020 (No 40-3/2020-DM-I (A))

The following measures shall be implemented:

1. Ensure that masks are used by every individual in plant.
2. Follow social distancing by maintaining at least 1 mtr distance between 2 person.
3. Ensure that no employee from the containment zone is permitted in premises.
4. All areas in the premises including the following shall be disinfected completely using user friendly disinfectant mediums –
 - Entrance gate of old plant and new plant
 - Canteen
 - Meeting room, conference room, open areas available
 - Equipment and New Extrusion Lift
 - Washroom, toilet, sink, water points
 - Walls / all other surfaces
5. All workers coming from outside to use own vehicle (not in public transport)
6. All vehicles and machinery entering the premises should be disinfected by spray mandatorily
7. Mandatory thermal scanning of everyone entering and exiting the workplace to be done
8. Medical insurance of the workers to be made mandatory
9. Provision for hand wash & sanitizer preferably with touch free mechanism will be made at all entry and exit points and common areas. Sufficient quantities of all the items should be available
10. Workplace shall have a gap of one hour between shifts and will stagger the lunch breaks of staff to ensure social distancing.
11. Large gathering or meeting of 10 or more people to be discouraged. Seating at least 6 feet away from others on job sites , in gatherings, meeting and training session
12. Not more than 2 persons will be allowed to travel in New Ext lift
13. Use of staircase in New Ext for climbing should be encouraged
14. There should be strict ban of gutka, tobacco etc and spitting should be strictly prohibited
15. There should be total ban of non-essential visitors at site
16. Hospitals / clinics in the nearby areas which are authorized to treat COVID-19 patients , should be identified and list should be available at work place at all the times
17. Issue identity cards to employee attending plant duty.
18. Inform Coke oven police station about names of person attending duty.

- Incoming shift personnel should report for work 30 mins before the start of shift to avoid crowding at the entry / exit points during shift change.
- At least 6 feet distance must be maintained between individuals at the entry and exit points.

Standard Operating Procedure for

ESSENTIAL VISITOR/SERVICE ENGINEER FROM OTHER DISTRICT/STATE.

Respective Department intimate in advance to Personnel Department regarding the visit of Essential Visitor/Service Engineers.

The Essential Visitor/Service Engineers will arrive Graphite India Ltd, he will be taken to sanitizing Counters for Initial Thermal Screening & hand sanitizing, where only asymptomatic visitors would be allowed and moved to the Personnel Department for filling the SDF (Self-Declaration Form) as per the existing SOP.

Note: Personnel Department officers will ensure that the visitors have filled their SDFs properly.

If any essential visitors comes from other district / state, only asymptomatic persons shall be allowed In factory premises. Wearing of mask is mandatory for all.

If any risky visitors identified would be sent to Govt. Hospital and subsequently will have to follow instruction of Hospital.

In the workplace he should wear mask and maintain social distancing.

In case any meeting with outside person is planned by any employee same should be carried out in a designated room.

4) **Protocols:**

A. Hygiene & Sanitation of Workplace:(vide check list GID/SAF-F011&SOP-MHA Dated 15.04.2020-No.40-3/2020-DM-1(A)

All areas in the office and manufacturing premises including the following shall be disinfected completely using user friendly disinfectant mediums.

- Entrance Gate of Building, Office etc.
- Meeting room, Conference halls
- Central air-conditioning vents
- Open areas
- Corridors
- Entrance Gate of Site, Building etc.
- Equipment which are operated manually by employees / associates

- Washroom, Toilet, Sink etc.
- Open drains, Walls

vide check list No: GID-SAF-F011.

- Frequently touched surfaces such as switches, door handles, restroom taps, All other surfaces where there is a probability of human contact including frequently touched surfaces such as entrance gate / doors, turnstile handles, door handles etc. to be sanitized at short intervals.
- A fixed frequency of cleaning and the disinfectant medium must be maintained for offices.

Every Entry & Exit Point / Shop floors / Offices / Canteens / Loading / Unloading / Parking area should be provided with the following facilities:

- Hand washing kiosks with liquid soap and water.
- Alcohol based Hand Sanitizers (with minimum 70% alcohol content)
- Foot press type door opener – closer to avoid direct hand contact.
- Chewing of gutka, tobacco etc. inside the premises is strictly prohibited.
- Spitting in open area inside the plant premises is strictly prohibited.
- All the sanitizers are being kept in a designated place of personnel Department.

The area has been marked with “**Fire Prone Tag**”.



**SAFEST BET:
WASH HANDS**

Washing hands frequently removes or kills disease-causing germs one may have picked up through the day

Global Advisory
WHO | World Health Organisation says hand hygiene is the most important prevention tool against coronavirus (Covid-19)
CDC | As per Centers for Disease Control & Prevention, US, washing hands with soap & water is the best prevention method

SOAP & WATER OR SANITIZER?
Soap & Water The Best

- > Soap-and-water is superior to sanitizers as the latter fail to eliminate all types of germs
- > Also, people use hand sanitizers incorrectly. They may not use enough

sanitizer drops or wipe the liquid off before it dries

- > Sanitizers may not be effective on dirty and greasy hands

Alcohol A Substitute

- > When soap isn't available, an alcohol-based hand sanitizer can be used

60% should be such a sanitizer's minimum alcohol content

B.Screening at Entry & Exit Points:(vide check list **GID-SAF-F011&SOP-MHA dated 15.04.2020-No.40-3/2020-DM-1(A)**)

- Contactless thermal scanning for body temperature of each individual at all Plant Locations / Offices shall continue.
- Persons with temperatures above 37.5 degree Celsius and those with flu like symptoms should be politely denied entry into our premises and advised to consult doctor / health officials for further screening.
- Installation of Sanitization tunnels – Walk-thru sanitization tunnels are to be placed at all entry points for disinfecting everyone who enters our premises.
- Overlapping of shift entry and shift exit should be avoided. Separate entry / exit points should be provided for so that people maintain safe distance from each other.
- Incoming shift personnel should report for work 30 mins before the start of shift to avoid crowding at the entry / exit points during shift change.
- At least 6 feet distance must be maintained between individuals at the entry and exit points.
- All employees, associates, customers, suppliers, visitors etc. should use face mask while they are inside the Plant Locations / Offices in order to

mitigate the transmission of COVID19.

- All vehicles and machinery entering the premise should be disinfected by spray mandatorily.



B. Attendance Recording:

- In Bio-metric punching system thumb press has been deactivated.
- Only face recognition punching are been used in plant.
- While recording attendance at least 3 feet distance must be maintained between individuals.



C. Internal Business Meetings

- Internal business meetings should as far as feasible be conducted through productivity tools like videoconference, voice calls etc.
- In extreme case requirement of face to face meeting, assembling of more than **10** persons in a conference / meeting room is not allowed. In such cases, it should be ensured that the chairs are appropriately spaced to maintain a minimum 6 feet distance between participants. The additional participants can join through videoconference / voice calls from their respective work locations.
- Agenda based meetings should be encouraged.

D. Shop floors

- All operating panels handle to be compulsorily sanitized after completion of every shift using user friendly disinfectant medium.
- Cleaning and Sanitization of shop floor should be carried out using user friendly disinfectant medium at regular intervals.
- Individuals should maintain a minimum safe distance of 6 feet while working at shop-floor.
- Physical meetings to be avoided to the extent possible. If essential, appropriate distancing to be maintained.
- Tool Box Meeting shall contain the awareness about COVID 19 and measures to prevent spread.
- Periodic checks of compliance shall be carried out by Safety Officer and team. vide check list No: GID-SAF-F011.
- Frequently touched surfaces such as switches, door handles, restroom taps, flush mechanisms etc. to be sanitized at short intervals.
- Sharing of PPEs should be strictly restricted.
- Every Emergency Assembly Points must be ensured with adequate space availability to stand / gather for crowd maintaining social distancing. Proper marking of standing position to be demarcated.



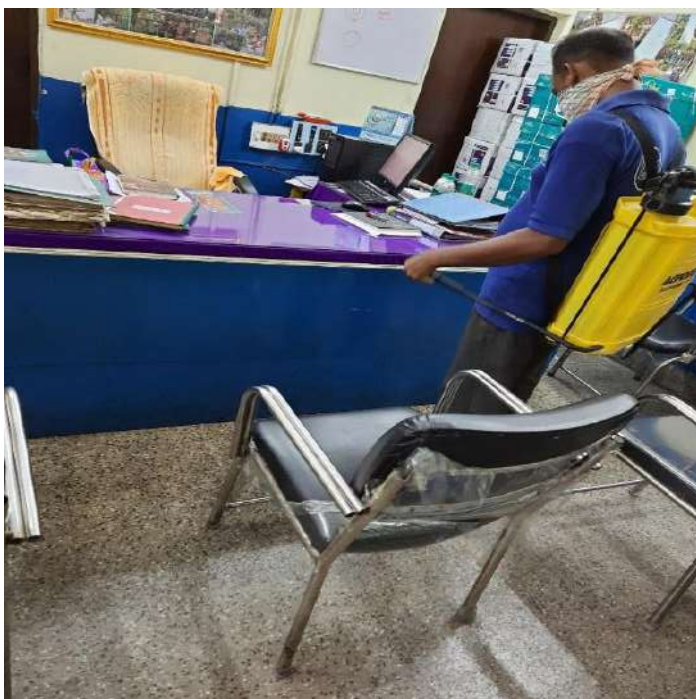
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A. Norms for offices

- Employees sitting plans should ensure a minimum distance of 6 feet between individuals.
- Employees shall work from their desk and avoid going to other's desk as far as possible.
- If required, offices can operate in staggered shifts like A Shift (6 am to 2 pm), B Shift (2 pm to 10 pm), C Shift(10 pm to 6 am) & General Shift (8.00 am to 5:00 pm)

- Hard copies of documents (unless mandatory) should be avoided and use of emails / digital mode to be fully leveraged.
- To ensure that all doors are in open condition always during office hours.
- As far as possible, air-conditioning shall be avoided and natural ventilation shall be used.
- Frequently touched surfaces such as switches, door handles, restroom taps, flush mechanisms etc. to be sanitized at short intervals.



B. Canteens

- At manufacturing locations, canteens can be operated with the following restrictions:
 - i. At any point in time not more than 50% of the canteen seating capacity should be utilized, while making sure that a minimum of 6 feet distance is maintained between individual seating.
 - ii. Self-Service should be discontinued at the counters and only canteen staff should serve on the plates so as to avoid multiple handling of servicing spoons.

- iii. There should be a safe distance of at least 3 feet between each individual who stand in the food counter queue. Appropriate demarcation should be made on the floor.
 - iv. Canteen service should be staggered into 3 to 4 turnaround cycles of 30 mins per cycle for each meal (Breakfast / Lunch / Dinner / Snacks). Departments / Sections should be communicated the specific stagger timing applicable to them, during which their employees can avail the canteen facility to avoid overcrowding.
- Employees should be encouraged to bring home cooked food.





A. Common access places

- Hand sanitizers shall be kept in common places always.
- Gathering of people in common passage, parking etc must be avoided.

B. Company Transport

- The company vehicle driver must be screened every day for symptoms related to COVID-19 including thermal scanning of body temperature. He must use mask and sanitizer while in duty.
- Hand sanitizer should be made available in vehicle, so that person boarding, mandatorily sanitize their hands.
- Only three persons will be allowed to share the vehicle excluding driver.
- Make sure that there is a minimum distance of 3 feet between each person boarding and alighting from the vehicle
- All passengers to wear mask while travelling.
- Windows to be kept open for fresh air to flow (avoid AC as much as possible in transport)
- Pillion rider shall not be allowed on two wheelers.



Disinfection of Material Vehicle with 1% Sodium Hypochlorite

A. Visitor Management

- It is encouraged to use digital modes like videoconference, voice calls etc to conduct meeting with visitors rather than inviting them to GRAPHITE INDIA premises.
- In case of any exception (only Location Head can approve exceptions), visitor shall be given access only till Visitor Meeting Area, under no circumstances visitors should be allowed to visit the employee work desk / Cabins.
- Every visitor shall have to give a self-declaration regarding travel history of the past 30 days and whether they have any flu like symptoms. They shall also be screened for body temperature through thermal scanner.
- Screening protocol as mentioned at point B above shall be applicable to all visitors at our premises.

B. Incoming materials in plants & offices

- Incoming materials and packets should be appropriately disinfected by user friendly disinfectant medium before they are unpacked for use.

C. Domestic & International Business Travels

- All business-related travel, both domestic and overseas must be restricted.
- Only business critical domestic travel may be undertaken in extreme

urgency, employees to use own discretion regarding the same.

- Use of telephone services, videoconferencing, voice calls and other teleconferencing facilities to be maximized for all business interactions.

D. Disclosure on Personal trips

- All non-essential personal travel within India and overseas should be avoided
- Every employee must give voluntary declaration of their personal travel history outside base location.

E. Guest House

- Guest houses to remain operative keeping all General Safety norms of COVID 19 .
- All Guests staying in guest house should be screened for body temperature through thermal scanner and flu like symptom and also sanitization.
- Every Guest to give a self-declaration on travel history for past one month.

F. Residential Areas

- Employees / Residents including their family members shall avoid unnecessary movements outside and adopt stay at home concept.
- Use nose mask whenever going outside home
- Restrict the children inside the home itself.
- Try to avoid entertaining guests / vendors / others to their homes.
- Try to manage household works and avoid engaging maids / outsiders.
- Entry of e-commerce delivery agents like Amazon, Flipkart, Big Basket, etc to be avoided and collection to be done at main gate or designated collection points.

G. Work from Home

- Those who are permitted to work from home, shall not leave their base location.
- In order to be productive while working from home, employees should ensure that they have access to internet connectivity, laptop and company approved videoconferencing softwares. In that case confidentiality should be maintained.

C. Labour colonies of project sites

Contractors should ensure the following for their respective labour camps / labourers:

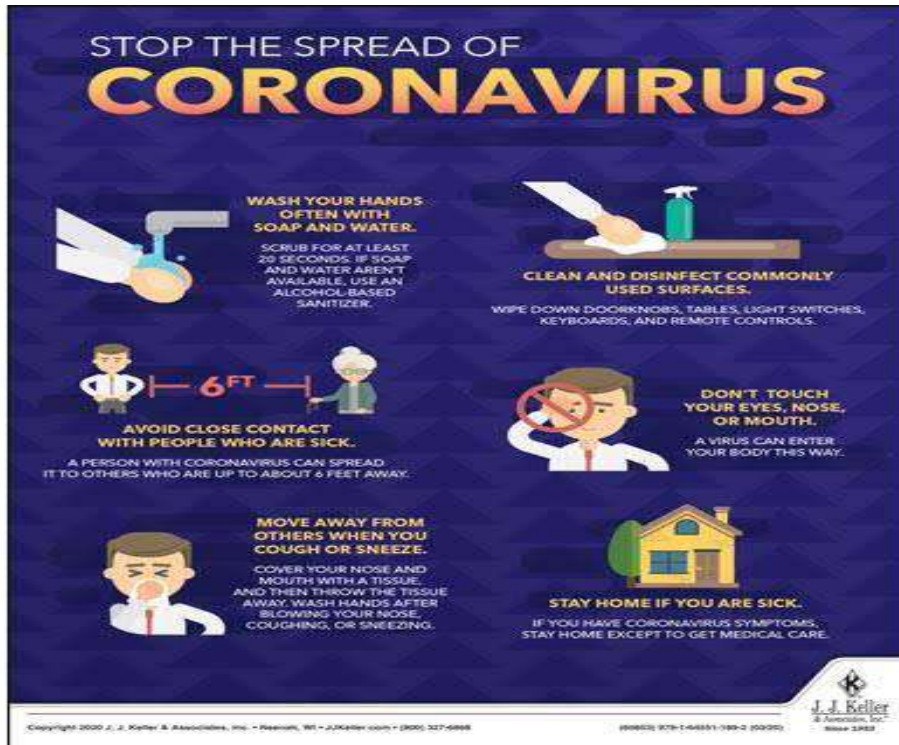
- All areas outside quarters, utility areas, drainages, waste bins, etc are to be cleaned and sanitized on daily basis.
- Special attention be given to wash rooms / toilets by periodical cleaning and disinfecting.
- Soap solutions / hand sanitizers shall be placed in all quarters / wash rooms places where ever required and replenished periodically.
- Appropriate masks shall be distributed to all labourers.
- Everyone should wear mask always while at colony, movement outside and during duty timings.
- Social distancing shall be ensured in keeping occupants in a single room.
- Disinfectant spraying should be done at all the areas of colony after workers leave for work daily.
- Arrangements to be made to supply all essential items like rice, wheat, groceries, water, etc. at colony itself so as to restrict movements of labourers.

D. Medical staff

- All medical staff including Doctors, Medical attendants should wear necessary PPEs as applicable while attending to patients with flu like symptoms:
 - Goggles
 - Face shield,
 - Mask,
 - Gloves,
 - Coverall / gowns (with or without aprons),
 - Head cover and
 - Shoe covers
 -

E. Display of important information

Hospitals/clinics in the nearby areas, which are authorized to treat COVID-19 patients, should be identified and list should be displayed at prominent places at work place all the times.



A. Registration in the Aarogya Setu App

Every employee/ associates including contractor must download and register their details in the Aarogya Setu App. They should also encourage their family members to get registered on this app.



Guidelines for COVID- 19 Infection/ Symptoms found in any Employee.

1. If any employee shows any symptoms of disease like HIGH TEMPERATURE, BODY ACHE, COMING FROM COVID POSITIVE AREA, he should be immediately sent to SD Hospital for detection and further action.
2. Only asymptomatic persons those who will submit certificate from Department of Health & Family Welfare Govt, of West Bengal shall be allowed in the building premises to attend the office.
3. If symptoms persists and COVID 19 found positive in any employee then the department where the employee works should be closed for doing proper sanitization with barricade so that no other employees come closer.
4. Sanitization must be done, wearing full PPE KIT so that the person doing sanitization work not get effected in any case.
5. The crew in which the infected persons' is working also be have quarantined for fourteen days.
6. After completing the quarantine period in good health, the co-employees can join after taking clearance from Medical officer/ as per guidelines of the company.
7. The Covid 19 infected person can resume his duty after completing treatment and on getting Covid negative certificate from the treating hospital/ Doctor.
8. Finally before joining duty he has to take clearance from P & A department.

9. Name and phone Number of Hospital for COVID-19 treatment has been displayed at Occupational Health Centre.

COVID Safety precaution for Outdoor Inspection & visits to customer

At Graphite India Ltd, Our goal is to protect our employees' health and safety, whether at the work Site or while travelling.

During COVID-19 pandemic outbreak period, we encourage travel for business-essential reasons Only with required approval from Plant head.

Travel Requirement Notifications:

At the planning phases of a trip, consider the cost and alternative ways to get the same result Without a trip.

Take note of any changes in travel requirement.

All business travel must comply with local government guidelines, including regulations for entry And quarantine. It should be taken into consideration during the planning phase.

Graphite India Ltd adheres to the all local regulatory authorities directive regarding lock down or Stopping all travel in and out of impact cities/countries.

Bring the proper COVID-19 safety protection. This is important for your and other's safety. Some Airlines and public transportation providers are operating with specific mandates regarding face and Hand protection. Before trip, please research travel provider rules, as these change frequently.

Remember and practice the following safety protocols:

- Be mindful of touching surfaces. Carry and use wipes wherever possible.
- Carry personal hand sanitizer if possible.
- Practice physical distancing as much as possible.
- **Return from business trip :**

Follow local quarantine guidelines, where applicable. If you returning home, and your home location requires a mandatory or recommended quarantine, follow those regulations before returning to a Graphite India work or Office site.

Note: Sending and receiving location need to check the risk of our employee being quarantined 14 days upon arrival or departed.

Note:

Refer to following website to understand more about Travel restrictions/requirements during COVID period.

<https://www.india-briefing.com/news/india-international-travel-latest-rules-20683.html/>
www.iatatravelcentre.com

Annexure-R

The spread of communicable diseases is a major health concern in this interconnected world. These are caused by pathogens that can be easily transmitted from one human to another or from animals to humans. Prevention of communicable disease transmission is important to prevent disease outbreaks and pandemics. In this mini-blog, we will explore some practical tips and strategies to prevent the transmission of communicable or contagious diseases.

What are communicable diseases?

A communicable disease is a disease that can be transmitted from one person to another in different ways, such as through contact with body fluids, airborne viruses, or insect bites. As these diseases spread by contact with contaminated people, air, animals, or objects, they are also called contagious diseases. Bacteria, viruses, fungi, and protozoa are some pathogens that are responsible for the spread of communicable diseases. The spread depends on specific diseases and causative organisms. A few modes of disease transmission are:

Physical contact with an infected person, such as touch, sexual intercourse (hepatitis, AIDS), droplets (influenza), or faecal/oral route (hepatitis A).

Through contaminated surfaces or objects, food, blood, or water

Through animal bites, for example, malaria, plague, and yellow fever

Through air droplets, for example, tuberculosis and measles.

How to Prevent Communicable Diseases?

Adoption of healthy habits can be helpful in the prevention of the spread of communicable diseases. Some of these include:

Handling and preparing food safely. Many communicable diseases are water- or food-borne, therefore, washing hands, utensils, vegetables, fruits, and surfaces while preparing food can be an effective way to prevent disease transmission.

Washing hands often and after using the bathroom, eating, cooking, or treating a wound or contact with a sick person can help prevent the spread of the disease.

Disinfecting and cleaning commonly used surfaces

Coughing and sneezing into a tissue, handkerchief, or sleeves

Not sharing personal-use items with others

Getting vaccination

Avoiding contact with wild animals

Staying home when having a communicable disease

Conclusion

Communicable diseases are a persistent concern due to their easy transmission. These can lead to widespread outbreaks if their chain of spread is not stopped. The risk of transmission can be reduced by taking simple yet effective measures to control the disease. Preventive measures are a great method for safeguarding both personal and public health. Following these steps is crucial in our ongoing battle against communicable diseases. Comprehensive health insurance plans often include wellness programs and health education, promoting awareness about effective disease prevention strategies.

Communicable Disease Prevention and Control in a Factory

To prevent and control communicable diseases in a factory, consider the following measures:

Vaccination and Health Checks

1. Encourage employees to get vaccinated against seasonal flu and other relevant diseases.
2. Conduct regular health checks and monitoring.

Hygiene Practices

1. Provide hand sanitizers and soap for handwashing.
2. Ensure proper cleaning and disinfection of surfaces, equipment, and common areas.
3. Promote good respiratory hygiene (covering mouth and nose when coughing/sneezing).

Social Distancing

1. Implement physical distancing measures (e.g., staggered breaks, remote work options).
2. Limit close contact between employees.

Personal Protective Equipment (PPE)

1. Provide PPE (masks, gloves) when necessary.
2. Ensure proper use, disposal, and replacement.

Sick Leave Policy

1. Encourage employees to stay home when sick.
2. Provide paid sick leave to prevent employees from coming to work while ill.

Education and Awareness

1. Educate employees on disease prevention and control measures.
2. Display posters and reminders.

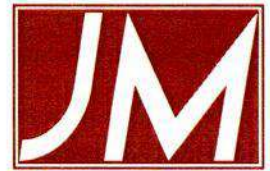
Collaboration with Health Authorities

1. Report outbreaks or suspected cases to local health authorities.
2. Follow guidance from health authorities.

By implementing these measures, factories can reduce the risk of communicable disease transmission and maintain a healthy work environment.

J.M. ENVIROLAB PVT. LTD.

Recognized by CPCB under EP Act-1986, Certified by ISO-9001:2015, 14001:2015 & 45001:2018



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Reg. Office & Lab. : 424, Ground Floor, Udyog Vihar Phase-IV, Gurugram 122015, Haryana, India

E-mail: jmenvirolab@hotmail.com www.jmenvirolab.com

TEST REPORT

Sample Number: **JME/GHIL/AN/01** Report No.: **JME/AN/260327090**
 Name & Address of Unit: **M/s. Graphite India Limited** Format No.: **7.8 F-04**
Proposed Expansion of Capacity from 67 KTPA to 80 KTPA at JL No. 85 & 92, Village Sagarbhangra, Durgapur, District Paschim Bardhaman, West Bengal. Party Ref. No.: **Nil**
 Reporting Date: **30/03/2026**

Sample Description: **AMBIENT NOISE LEVEL MONITORING** Receipt Date: **27/03/2026**

General Information

Client Representative (Name & Designation) **Mr. C.P. Dhanuka (Sr. Manager)**
 Sample collected by **JMELPL Team**
 Sampling Location **Plant Site (Near Main Gate)**
 Date of Monitoring **23/03/2026 to 24/03/2026**
 Time of Monitoring **06:00 AM to 06:00 AM**
 Latitude **23°29'29" N**
 Longitude **87°20'04" E**
 Instrument used **Sound Level Meter**
 Instrument code **JME/SLM/01/08**
 Instrument calibration status **Calibrated**
 Meteorological condition during monitoring **Clear Sky**
 Ambient Temperature (°C) **Max 29°C, Min 19°C**
 Surrounding activity **Transportation activities.**
 Scope of Monitoring **Regulatory Requirement**
 Control measure if any **--**
 Sampling Protocol **JMELPL/STOP/04**
 Parameter Required **As per work order**

TEST RESULTS

S. No.	Test Parameter	Test Method	Result		Unit
			Day Time (06:00 AM to 10:00 PM)	Night Time (10:00 PM to 06:00 AM)	
1.	Leq	IS 9989	61.2	50.9	dB(A)

CPCB NOISE STANDARDS

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

1. Day Time is from 6.00 AM to 10.00 PM.
 2. Night Time is reckoned between 10.00 PM to 6.00 AM.
 3. Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.
 Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

Page 1 of 1

Checked by

Deepak Singh

Reviewed & Authorized by

Sita Ram Yadav

Note:

1. This test report pertains solely to the tested sample as received.
2. This report shall not be reproduced without in full.
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4. The sample will be destroyed after the specified retention period unless prior instructions are received.
5. All disputes are subject to the exclusive jurisdiction of Gurugram only.

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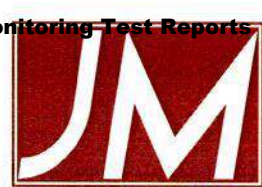
End of Report

J.M. ENVIROLAB PVT. LTD.

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E-mail: jmenvirolab@hotmail.com www.jmenvirolab.com



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TEST REPORT

Sample Number: **JME/GHIL/AN/02** Report No.: **JME/AN/260327091**
 Name & Address of Unit: **M/s. Graphite India Limited** Format No.: **7.8 F-04**
Proposed Expansion of Capacity from 67 KTPA to 80 KTPA at JL No. 85 & 92, Village Sagarbhanga, Durgapur, District Paschim Bardhaman, West Bengal. Party Ref. No.: **Nil**
 Reporting Date: **30/03/2026**

Sample Description: **AMBIENT NOISE LEVEL MONITORING** Receipt Date: **27/03/2026**

General Information

Client Representative (Name & Designation) **Mr. C.P. Dhanuka (Sr. Manager)**
 Sample collected by **JMELPL Team**
 Sampling Location **Plant Boundary (North)**
 Date of Monitoring **23/03/2026 to 24/03/2026**
 Time of Monitoring **06:00 AM to 06:00 AM**
 Latitude **23°29'30" N**
 Longitude **87°20'16" E**
 Instrument used **Sound Level Meter**
 Instrument code **JME/SLM/01/06**
 Instrument calibration status **Calibrated**
 Meteorological condition during monitoring **Clear Sky**
 Ambient Temperature (°C) **Max 29°C, Min 19°C**
 Surrounding activity **Plant operation.**
 Scope of Monitoring **Regulatory Requirement**
 Control measure if any **--**
 Sampling Protocol **JMELPL/STOP/04**
 Parameter Required **As per work order**

TEST RESULTS

S. No.	Test Parameter	Test Method	Result		Unit
			Day Time (06:00 AM to 10:00 PM)	Night Time (10:00 PM to 06:00 AM)	
1.	Leq	IS 9989	63.9	53.4	dB(A)

CPCB NOISE STANDARDS

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

- Day Time is from 6.00 AM to 10.00 PM.
 - Night Time is reckoned between 10.00 PM to 6.00 AM.
 - Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.

Page 1 of 1


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Deebak Singh


 Reviewed & Authorized by
Sita Ram Yadav

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End of Report

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E-mail: jmenvirolab@hotmail.com www.jmenvirolab.com

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TEST REPORT

Sample Number: **JME/GHIL/AN/03** Report No.: **JME/AN/260327092**
 Name & Address of Unit: **M/s. Graphite India Limited** Format No.: **7.8 F-04**
Proposed Expansion of Capacity from 67 KTPA to 80 KTPA at JL No. 85 & 92, Village Sagarbhanga, Durgapur, District Paschim Bardhaman, West Bengal. Party Ref. No.: **Nil**
 Reporting Date: **30/03/2026**

Sample Description: **AMBIENT NOISE LEVEL MONITORING** Receipt Date: **27/03/2026**

General Information

Client Representative (Name & Designation)	Mr. C.P. Dhanuka (Sr. Manager)
Sample collected by	JMELPL Team
Sampling Location	Plant Boundary (West)
Date of Monitoring	25/03/2026 to 26/03/2026
Time of Monitoring	06:00 AM to 06:00 AM
Latitude	23°29'21" N
Longitude	87°20'27" E
Instrument used	Sound Level Meter
Instrument code	JME/SLM/01/08
Instrument calibration status	Calibrated
Meteorological condition during monitoring	Clear Sky
Ambient Temperature (°C)	Max 32°C, Min 17°C
Surrounding activity	Utility Operations.
Scope of Monitoring	Regulatory Requirement
Control measure if any	--
Sampling Protocol	JMELPL/STOP/04
Parameter Required	As per work order

TEST RESULTS

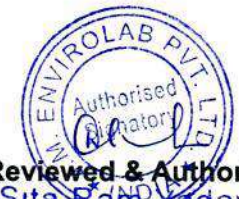
S. No.	Test Parameter	Test Method	Result		Unit
			Day Time (06:00 AM to 10:00 PM)	Night Time (10:00 PM to 06:00 AM)	
1.	Leq	IS 9989	62.7	52.6	dB(A)

CPCB NOISE STANDARDS

Category of Zones	Leq in dB(A)	
	Day	Night
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence Zone	50	40

- Day Time is from 6.00 AM to 10.00 PM.
 - Night Time is reckoned between 10.00 PM to 6.00 AM.
 - Silence Zone is defined as an area up to 100m around premises of Hospitals, Educational Institutions and Courts. Use of vehicle horn, loudspeaker and bursting of crackers is banned in these zones.
- Note: Mixed categories of areas be declared as one of the four above mentioned categories by the competent Authority and the corresponding standards shall apply.


 Checked by
Deepak Singh Yadav


 Reviewed & Authorized by
Sita Ram Yadav

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GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To,
The Office of the Sub-Divisional Officer,
Durgapur Sub-Division,
Paschim Bardhaman,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

Sub: Submission of Environmental Clearance (EC) copy to Head of local bodies / relevant Government offices.

Dear Sir,

This is in reference to above mentioned Environmental clearance, we are submitting the copy of EC as per the attached EC condition in Point 2.6 of page 12 for compliance.

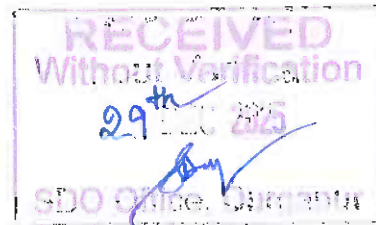
Kindly acknowledge and oblige.

Thanking you,

Yours Faithfully,
For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above





GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To,
The Office of the General Manager,
District Industries Center,
Paschim Bardhaman,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

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Yours Faithfully,

For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above

J.K. Saha
29-12-2025
Received (Contents not Verified)
DIC-Paschim Bardhaman
Durgapur, Govt. of West Bengal



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To,
The Office of the Durgapur Municipal Corporation,
Paschim Bardhaman,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

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Yours Faithfully,

For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above

c.i.d
(GI)
S. Nait
29/12/2025
Received Not Verified
Durgapur Municipal Corporation

Registered Office : 31, Chowringhee Road, Kolkata - 700016
CIN - L10101WB1974PLC094602
PH. : +91-33-40029600 Fax : +91-33-40029676
E-mail id : gllro@graphiteindia.com Website : www.graphiteindia.com



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To,
The Office of Environmental Engineer,
West Bengal Pollution Control Board,
Durgapur Regional Office,
Sahid Khudiram Sarani,
City Center,
Durgapur - 713216.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

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Yours Faithfully,

For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above



Registered Office : 31, Chowringhee Road, Kolkata - 700016
CIN - L10101WB1974PLC094602
PH. : +91-33-40029600 Fax : +91-33-40029676
E-mail id : gllro@graphiteindia.com Website : www.graphiteindia.com



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To,
The Office of the Block Development Officer,
Durgapur -Faridpur Development Block,
Paschim Bardhaman,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

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Kindly acknowledge and oblige.

Thanking you,

Yours Faithfully,

For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above

Received No. 2288

RECEIVED WITHOUT VERIFICATION

Receiving Staff 29/12/25

Block Development Office
Durgapur Faridpur

Registered Office : 31, Chowringhee Road, Kolkata - 700016
CIN - L10101WB1974PLC094602
PH. : +91-33-40029600 Fax : +91-33-40029676
E-mail id : glro@graphiteindia.com Website : www.graphiteindia.com



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To,
The Office of the Sabhadhipati,
Paschim Bardhaman Zilla Parishad,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

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Dear Sir,

This is in reference to above mentioned Environmental clearance, we are submitting the copy of EC as per the attached EC condition in Point 2.6 of page 12 for compliance.

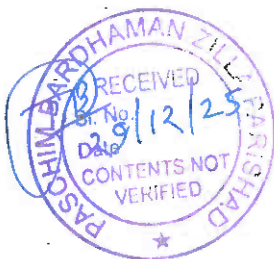
Kindly acknowledge and oblige.

Thanking you,

Yours Faithfully,
For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above



Registered Office : 31, Chowringhee Road, Kolkata - 700016
CIN - L10101WB1974PLC094602

PH. : +91-33-40029600 Fax : +91-33-40029676

E-mail id : gllro@graphiteindia.com Website : www.graphiteindia.com



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

R-7167
29/12/25

Dt: 26.12.2025

To,
The Office of Additional District Magistrate (LR),
Paschim Bardhaman,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

Sub: Submission of Environmental Clearance (EC) copy to Head of local bodies / relevant Government offices.

Dear Sir,

This is in reference to above mentioned Environmental clearance, we are sumitting the copy of EC as per the attached EC condition In Point 2.6 of page 12 for compliance.

Kindly acknowledge and oblige.

Thanking you,

Yours Faithfully,
For Graphite India Limited.

Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above

C.C.S.

Received
but Contents are not verified

CP 29/12/25
Recd:
DL & LRO, Paschim Bardhaman



GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 26.12.2025

To, *The District Magistrate*
The Office of District Magistrate,
Paschim Bardhaman,
Govt. of West Bengal.

Ref: EC Identification no. EC25B2301WB5490851N Dt: 26.12.2025 for Proposed Expansion of Capacity From 67 KTPA to 80 KTPA

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Yours Faithfully,
For Graphite India Limited.

Ranadeep Chakraborty
Ranadeep Chakraborty
Sr. Vice President(Works)

Enclosed - As above





GRAPHITE INDIA LIMITED

DURGAPUR-713211, DIST. - BURDWAN
E-MAIL : general_dgp@graphiteindia.com

Dt: 23.09.2025

To,
The Office of Environmental Engineer,
West Bengal Pollution Control Board,
Durgapur Regional Office,
Sahid Khudiram Sarani,
City Center,
Durgapur - 713216.

Sub: "Environmental Statement" of M/s. Graphite India Limited, Durgapur 713211, W.B., for the financial year, ending 31st March, 2025 in Form V, in compliance with the requirement of "Environment protection Amendment Rule(1993, Rule-2(b))" notified vide G.S.R 3'6(E) dated 22.04.1993

Dear Sir,

On the above stated matter, enclosed please find herewith one set of "ENVIRONMENTAL STATEMENT", in Form - V prepared by our Sr. Manager (Technical) for your kind perusal.

Hope, you will find everything in order.

Thanking you,

Yours Faithfully,
For Graphite India Limited.

Ranadeep Chakraborty
(Sr. Vice President Works)

Encl: Environmental Statement



Form – V
(See rule 14)

Environmental Statement for the financial year ending the 31st March 2025

Part – A

i) Name and address of the owner/ occupier of the industry, operation or process:	GRAPHITE INDIA LIMITED, DURGAPUR – 713211 DISTRICT: BURDWAN (W.B)
ii) Industry Category:	LARGE
iii) Production Capacity-Units:	Graphite Electrodes(includes Nipple) – 5583.33MT/Month
iv) Year of Establishment	1967
v) Date of last Environment Statement submitted.	25/09/2024

Part –B

WATER AND RAW MATERIAL CONSUMPTION

1. WATER CONSUMPTION

PROCESS + COOLING : 239 M³ / DAY
DOMESTIC : 30 M³ / DAY

NAME OF PRODUCTS	PROCESS WATER CONSUMPTION PER UNIT OF PRODUCTS	
	DURING THE PREVIOUS FINANCIAL YEAR (2023-2024)	DURING THE CURRENT FINANCIAL YEAR (2024-2025)
GRAPHITE ELECTRODE AND NIPPLES	1.83M ³ /MT OF PRODUCT	1.55M ³ /MT OF PRODUCT

2. RAW MATERIAL CONSUMPTION

NAME OF RAW MATERIAL	NAME OF PRODUCTS	CONSUMPTION OF RAW MATERIAL PER UNIT OF OUTPUT	
		DURING THE PREVIOUS FINANCIAL YEAR (2023-2024)	DURING THE CURRENT FINANCIAL YEAR (2024-2025)
1. CALCINED PETROLEUM COKE	GRAPHITE ELECTRODE & NIPPLES	0.86MT/MT OF OUTPUT	0.83MT/MT OF OUTPUT
2. COAL TAR PITCH (BINDER)		0.22MT/MT OF OUTPUT	0.21MT/MT OF OUTPUT
3. EXTRUSION OIL (LUBBRICANT)		0.005MT/MT OF OUTPUT	0.005MT/MT OF OUTPUT
4. PI PITCH AND OTHERS		0.16MT/MT OF OUTPUT	0.18MT/MT OF OUTPUT

N.B: Raw material consumption has been quantified based on actual data.

Part – C**Pollution discharged to Environment**
(Parameter as specified in the consent issue)

POLLUTANTS	QUANTITY OF POLLUTANTS DISCHARGED (KG/DAY)	CONCENTRATION OF POLLUTANTS DISCHARGED (mg/lit.)	PERCENTAGE OF VARIATION FROM PRESCRIBED STANDARD WITH REASON
a) WATER*	NA	NA	% LESS THAN STANDARD
I) BOD	-	-	-
II) COD	-	-	-
III) TSS	-	-	-
IV) OIL & GREASE	-	-	-
b) AIR (SPM)	<i>in KG/DAY</i>	<i>in mg/NM³</i>	
I) BOILER	Not in Operation		-
II) CUMULATIVE OTHER THAN BOILER	299.00	875.50	87.58

(Standard – Actual)

$$\% \text{ Variation} = \frac{\text{Standard} - \text{Actual}}{\text{Standard}} \times 100$$

N.B: “ Air Pollution” Load has been calculated based on M/s Envirocheck Report Dt: 20.11.2024

*Discharge from plant out fall is Zero. The discharge water is totally collected, filtered & Re-cycled.

Part – D**HAZARDOUS WASTES**

[As specified under Hazardous wastes / Management and Handling Rules, 1989]

HAZARDOUS WASTES	TOTAL QUANTITY	
	DURING THE PREVIOUS FINANCIAL YEAR (2023-2024)	DURING THE CURRENT FINANCIAL YEAR (2024-2025)
a) From Process	Used oil- 13.116 KL (MT) Waste oil- 11.767KL (MT), Oily Cotton waste- 2.46MT, Discarded Asbestos-3.7MT, Empty Discarded Drum/Container- 0.162MT, ETP Sludge-5.27MT Discarded Thermocole- 0.14MT(Disposed to CHWTSDF)	Used oil- 12.515 KL (MT) Waste oil- 13.150KL (MT), Oily Cotton waste- 2.539MT, Discarded Asbestos- 2.234MT, Empty Discarded Drum/Container- 0.182MT, ETP Sludge-3.6MT Discarded Thermocole-0.0MT
b) From Pollution Control Facilities (coal tar pitch)	301.87MT (sold)	362.16MT (sold)

Part – E**SOLID WASTES**

	**TOTAL QUANTITY	
	DURING THE PREVIOUS FINANCIAL YEAR (2023-2024)	DURING THE CURRENT FINANCIAL YEAR (2024-2025)
A) From Process		
1. Ash	Nil	NIL
2. HDPE Bags	Re-used/Sold to PWR	Re-used/Sold to PWR
B) From Pollution Control Facilities	Graphite fines / CPC fines as per the process chart	Graphite fines / CPC fines as per the process chart
C) Quantity recycled or reutilized within the unit.	NIL	NIL

*ASH (Non Hazardous)

**Refer Annexure 1

PART – F

Please specify the characteristics (in terms of concentration and quantum) of Hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Hazardous Waste & Solid waste: Please refer “Part D” & “Part E” of this Statement.

Hazardous waste is kept separately as per WBPCB norms and disposed to the Authorized vendors.

Solid Waste generate from Air pollution control facility and process is sold as by-product (Refer Annexure -1)

PART – G

Impact of Pollution Control Measures on conservation of natural resources and consequently on the cost of production.

Please refer “ Annexure – 1” enclosed here with.

PART – H

Additional Measures/Investment proposal for Environmental Protection including Abatement of Pollution, Prevention of Pollution.

Responsibilities of protecting the Environment is considered very seriously. We have taken a number of steps to keep the level of pollutants below the permissible limit by using control devices viz. Elevators, Screw Conveyors, Dust Collectors, Fume extractor, chimneys, Electrostatic precipitator, Incinerator, Pack media Retrieval System etc. We are using Clean Fuel CBM. Continuing Data logging system in the RH ESP unit to keep track of any tripping or activated alarm, Sprinkling of water done on the outside roads by dedicated water tanker to suppress the ambient dust pollution Road sweeping machine is used to maintain ambient environment within the plant. Discharge water is filtered & Re-cycled and no liquid is discharged outside. Ambient Monitoring station, Noise monitoring station, Effluent discharge monitoring through Web camera & OCEMS for Baking RH24-3 ESP Stack installed as per EC requirement. We are always trying our best to upgrade the Efficiency of control equipments as required. Regular Medical checkup of our workmen and staffs are being arranged. Plantation of new plants done in current financial year in and around the Plant area. GIL is Certified for ISO 14001: 2015 Environmental Management System, Certified for ISO 45001: 2018, Certified for Occupational Health & Safety Management system, Certified for ISO 50001:2018 Energy management System & SA 8000:2014– Social Accountability Management System as well as ISO 9001:2015 Quality Management System.

PART – I

Any other particulars for improving the quality of the Environment.

Activity for the improvement of the Environment:

1. Use of Road dust sweeping Machine for maintaining the internal roads.
2. Use of Water Effluent treatment plant.
3. Maintenance of old plants and additional Plantation in and around our factory premises.
4. Celebrated 5th June as World Environment Day and Bonomohatsav.
5. Installed Cooling water Recycling & Filtration unit for utilizing outfall water. There is no Discharge from the Plant Effluent Outfall.
6. Rain Water Harvesting
7. Registered as Importer & Brandowner for EPR Plastic waste.

Enclosed:

1. Xerox copy of the valid “Consent to Operate” for plant.
2. Copy of HW Authorization to operate a facility for Hazardous waste sale and storage categories from W.B.P.C. Board along with the revised Quantity Authorisation.
3. EC six monthly compliance submission letter copy;
4. Copy of CTE for 8000MT storage of CPC (Raw Material) Silos

Compiled By:



C.P.DHANUKA

SR. MANAGER (TECHNICAL)



LIFE
Lifestyle for
Environment

WEST BENGAL POLLUTION CONTROL BOARD
(Department of Environment, Government of West Bengal)
Paribesh Bhawan, 10A, Block – LA, Sector III, Bidhannagar
Kolkata – 700 106, Ph.: (033) 2202-3000, Fax : (033)2202-3099
Website: www.wbpcb.gov.in, Email: net.wbpcb-wb@bangla.gov.in

Memo No. **49** -2N-08/2020(E)

Date: **21**/01/2026

To

M/s. Graphite India Limited
PO. Sagarbhanga Durgapur,
Dist-Paschim Bardhaman, West Bengal, Pin-713211.

Sub: Your application for Consent to Establish (CTE) for Proposed Expansion of Capacity from 67 KTPA to 80 KTPA Graphite Electrodes at JL No. 85 & 92, Village: Sagarbhanga, Durgapur, District: Paschim Bardhaman, West Bengal.

Ref: EC identification no. EC25B2301WB5490851N, File No. IA-J-11011/250/2025-IA-II dated 26.12.2025.

Sir,

In reference to your Consent to Establish application for project mentioned above, this is to inform you that the West Bengal Pollution Control Board has scrutinized and processed your WBOCMMS application no. **7939400** having project cost of **Rs. 31500.0 lakhs** for which payment of necessary fees duly received.

Since, above mentioned project obtained Environmental Clearance (EC) from **Ministry of Environment, Forest and Climate Change, IA Division**; no CTE is required to be obtained from the West Bengal Pollution Control Board as per the provision of Gazette Notification issued by MoEF & CC vide no. GSR 702 and GSR 703 dated 12-11-2024.

All the conditions as stipulated in the abovementioned Environmental Clearance should be strictly complied with. You are required to obtain all necessary permission/clearances from various Government Authorities, as applicable for the project.

You are also required to obtain Consent to Operate (CTO) from the State Board as per the provision of the sub-section (1) of Section 25 of the Water (Prevention & Control of Pollution) Act, 1974 and sub-section (1) of Section 21 of the Air (Prevention & Control of Pollution) Act, 1981.

M. Kumar
21/01/2026

Chief Engineer (EIM Cell)