

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO.400/2019

In The Matter of:

Social Action for Forest & Environment (SAFE)

Applicant (s)

Versus

Union of India & Ors.

Respondent (s)

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23/10/2021

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DATE: 23.10.2021

PLACE: DELHI

Study on Adequacy of Tyre Pyrolysis Plants to Meet Environmental Concerns

(Advance Batch Automated Plants and Existing Batch Plants
vis-a-vis Continuous Plants)

**In Compliance of
Hon'ble NGT, Principal Bench, New Delhi's order dated 06-01-2020
in the matter of Original Application No. 400/2019
(Social Action for Forest and Environment (SAFE) vs. Union of India and Others.)**

**CENTRAL POLLUTION CONTROL BOARD
DELHI
October 2021**

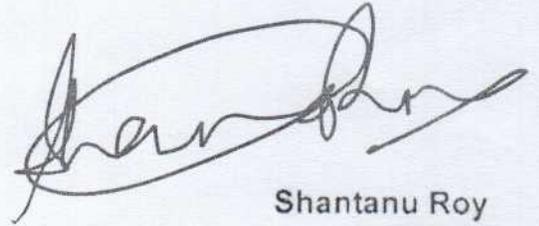
Anand Kumar

**REPORT
ON
STUDY ON ADEQUACY OF TYRE PYROLYSIS PLANTS TO
MEET ENVIRONMENTAL CONCERNS**

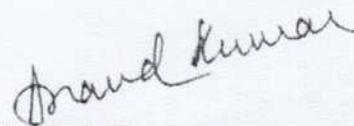
In compliance of Hon'ble NGT, Principal Bench order dated 06.01.2020, CPCB in association with expert from IIT Delhi and NEERI Nagpur has carried out study on Adequacy of tyre pyrolysis plants to meet environmental concerns. The study has been carried out as per protocol finalized by us and we have made effort to complete the study as per protocol. The report is being placed before the Hon'ble NGT (PB).


14/10/21

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Report on Adequacy Study of the Advance Batch Automated Tyre Pyrolysis Plants and Existing Batch Tyre Pyrolysis Plants vis-a-vis Continuous Tyre Pyrolysis Plant in the matter of O.A. No. 400/2019 before Hon'ble NGT (Principal Bench) New Delhi

1.0 BACKGROUND

- i. In the matter of Original Application (OA) No. 400/2019 (Social Action for Forest & Environment (SAFE) vs. Union of India & Others) where issue of management of waste tyres/end of life tyres (ELTs) by tyre pyrolysis industries was raised & deliberated. The Hon'ble NGT (PB), New Delhi vide its order dated 25-04-2019, directed Central Pollution Control Board (CPCB) to submit a report on 'Status of compliance of rules in the tyre pyrolysis industries and remedial measures required'.
- ii. In compliance of the order dated 25.04.2019, CPCB submitted its report on 31.07.2019 where compliance status of the rules, remedial measures and commonly observed environmental issues/concerns in operation of Tyre Pyrolysis Plants were detailed.
- iii. The Hon'ble NGT vide its order dated 19.09.2019 directed CPCB to issue appropriate directions on the subject after due consideration of the issue. The order emphasized that the directions should deal with the restrictions on import of waste tyres, regulate locations of such plants in the light of carrying capacity of the area, safeguarding health of workers and remedial actions for noncomplying plants.
- iv. In compliance of the order dated 19-09-2019, CPCB issued two directions under section 5 of the E (P) Act 1986 dated 04.12.2019 and 30.12.2019 respectively.
- v. Subsequent to Hon'ble NGT (PB) Order dated 19-09-2019, CPCB received representation from "All India Rubber & Tyre Recycler Association, Mumbai (AIRTRA)" informing that Advance Batch Automated Tyre Pyrolysis Plant are able to meet environmental issues/concerns as raised by CPCB and all the existing batch process plants be upgraded to Advanced Batch Automated Tyre Pyrolysis Plant instead of switching over to Continuous tyre pyrolysis plants. Another representation was received from 'Pyrolysis Industries Welfare Association, Punjab' informing that existing Batch Pyrolysis Plants are able to meet MoEF & CC SOPs, instead actions should be taken against the non-complying plants.
- vi. CPCB vide its status and compliance report submitted before Hon'ble NGT on 18-12-2019 requested that it intends to carry out study of advance batch automated tyre pyrolysis plants as well as existing batch tyre pyrolysis plants vis-à-vis continuous tyre pyrolysis plant to ascertain whether existing batch tyre pyrolysis plants would be able to meet environmental concerns or advance batch automated tyre pyrolysis plants are required to address the environmental concerns. It further stated that based on the outcome of the study it can be determined that whether existing batch /or advance batch automated tyre pyrolysis plant is required or only continuous tyre pyrolysis plants be allowed.
- vii. Hon'ble NGT (PB) vide its order dated 06-01-2020 directed that let the study be carried out with the involvement of NEERI and IIT, Delhi. (Copy of the order is at Annexure -I)

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**2.0 ACTIONS TAKEN BY CPCB IN COMPLIANCE WITH HON'BLE NGT (PB)
ORDER DATED 06.01.2020**

- i. In compliance of above order, CPCB requested IIT, Delhi and NEERI, Nagpur to nominate their representatives for carrying out the above stated study. Accordingly, the following nominations were received:
 - a) Dr. Shantanu Roy, Professor, Department of Chemical Engineering, IIT Delhi; and
 - b) Dr. K.V. George, Senior Principal Scientist & Head, CSIR - NEERI, Nagpur
- ii. Shri Anand Kumar, Scientist 'E' & Divisional Head WM- III Division represented CPCB in deciding the framework and protocol of the study. He also coordinated for carrying out the studies with NEERI, IIT Delhi and Regional Directorates (RDs) of CPCB.
- iii. Due to unprecedented COVID 19 pandemic and resulting lockdowns the study could not be taken up as per proposed timeline. A meeting was convened through video conference (**VC**) on 19-06-2020 on the approach to be adopted, frame work and scope of the study. Dr. K.V. George, Sr. Principal Scientist, CSIR – NEERI, Prof. Shantanu Roy, Chemical Engineering Department, IIT Delhi and Shri Anand Kumar, Scientist 'E' & Divisional Head, WM – III Division, CPCB participated in the VC.
- iv. Due to COVID-19 Pandemic, CPCB along with experts from IIT Delhi and NEERI Nagpur initially carried out virtual tours through video conference of four tyre pyrolysis plants (3 advance batch automated tyre pyrolysis plants and 01 continuous tyre pyrolysis plant). Accordingly, virtual tours were organised in respect of the following advance batch automated tyre pyrolysis plants and continuous tyre pyrolysis plant as mentioned below:
 - a) M/s Pairan Pyrolysis Pvt. Ltd., Plot No. S-20, SIPCOT Industrial Complex, Ingur Village, Perundurai Taluk, Erode District, Tamil Nadu (carried out on 30.09.2020);
 - b) M/s. Narmada Industries, Manurethi Road, Siltara Phase-2, Raipur, Chhattisgarh (carried out on 05.10.2020);
 - c) M/s Excel Industries (Unit-2), Phase-1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, Kolhapur, Maharashtra (carried out on 08.10.2020);
 - a) M/s Royal Carbon Black Pvt. Ltd., M/s Royal Carbon Black Pvt. Ltd., Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Village-Vanivali, Tal-Khalapur, Dist-Raigad, Maharashtra (carried out on 30.11.2020).
- v. CPCB again convened a video conference (**VC**) with representatives of NEERI & IIT Delhi on 25.11.2020 to decide on protocol, parameters and any other actions required for carrying out the study. During the VC it was decided to carry out actual monitoring at 04 plants where virtual tours were carried out earlier. Accordingly, in consultation with experts from IIT- Delhi and NEERI Nagpur protocol for carrying out field monitoring was finalized. The study protocol is detailed in subsequent section.

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- vi. CPCB, HO-Delhi requested its RDs namely RD-Chennai, RD Pune & RD Bhopal for coordination of studies at four plants finalized during the VC meeting held previously.
- vii. Study at M/s Pairan Pyrolysis Pvt. Ltd, Erode Tamil Nadu which is an Advance Batch Automated Tyre Pyrolysis Plant was carried out through CPCB RD Chennai during 06 -07 January 2021.
- viii. Study at M/s Excel Industries (Unit-2), Kolhapur, Maharashtra which is also an Advance Batch Automated Tyre Pyrolysis Plant was carried out through CPCB-RD Pune during 07-08 February, 2021.
- ix. Study at M/s Narmada Industries, Raipur, Chhattisgarh which is an Advance Batch Automated Plant was carried out through CPCB-RD Bhopal during 09-11 February, 2021.
- x. Study at M/s S.G Petrotech, Rohtak Haryana which is an Existing Batch Tyre Pyrolysis Plant was carried out by CPCB-HO Delhi during 04-06 August 2021.
- xi. Study at M/s Royal Carbon Black Private Limited, Raigad, Maharashtra, which is a Continuous Tyre Pyrolysis Plant was carried out through CPCB-RD Pune during August 11-12, 2021.
- xii. Study at M/s Tirath Ram, Ludhiana, Punjab, which is an Existing Batch Tyre Pyrolysis Plant was carried out by CPCB-HO Delhi during August 13-15, 2021.
- xiii. Study at M/s Mahie Green Earth Product, Muzaffarnagar, UP which is an Existing Batch Tyre Pyrolysis Plant was carried out by CPCB-HO Delhi during September 23-24, 2021.
- xiv. A video conference (**VC**) was convened on 24-09-2021 with expert members from IIT-Delhi and NEERI Nagpur where the outcomes of different studies were discussed and on the basis of which draft report was prepared and circulated to expert members for providing their comments.
- xv. The report has been finalised based on the comments of the expert members.
- xvi. The final report of the study is submitted by CPCB before Hon'ble NGT for kind consideration of its findings, conclusions and recommendations.

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3.0 TYRE PYROLYSIS PROCESS, ENVIRONMENTAL CONCERNS AND SOP

The tyre pyrolysis process is used for recovery of pyrolysis oil, carbon black and steel from waste tyres /end of life tyres (ELTs). A typical waste tyre /end of life tyre (ELT) consists of about 60 % volatile organics, 30 % fixed carbon and 10 % ash by weight. Elemental analysis shows that tyre rubber contains approximately 80 % C, 7 % H, 0.4 % N, 1.5 % S, 3% O and 8 % of ash by weight.

Pyrolysis is a chemical reaction that involves molecular breakdown of larger molecules into smaller molecules by heating in absence of air. Pyrolysis is also known as thermal cracking, thermolysis, depolymerization, etc. Pyrolysis of tyres & rubber products results into Pyrolysis Oil, Pyrolysis Gas (Pyro Gas), Carbon Black & Steel. The quantity and quality of each product depend on type of waste tyre including process variables, temperature, pressure, and residence time.

Typically, the process of tyre pyrolysis includes feeding of scrap tyres into reactor where they are heated in the absence of oxygen for the breakdown of long chain hydrocarbons (polymers). The reactors are generally of 2.1 meter to 2.8-meter diameter and length of 6 meter to 6.5 meter. Heating of the reactor is carried out through burners which uses liquid or gaseous fuel or wood for initial heating. The reactor is rotated slowly during the heating process. The pyro gas starts generating at around 120°C -150°C. Top of outer jacket of the reactor is connected to air pollution control device (APCD), ID Fan and stack of height of about 30 meter from the ground for flue gas emissions. The reactor is maintained at 200°C for 1.5-2.0 hours and then increased to 250°C to 300°C where it is maintained for 3 to 4 hours. The operating temperature varies from unit to unit and in some cases it goes even up to 500°C. Reactor is further connected with series of condensers where condensation of gases produces Pyrolysis Oil. The lighter fraction of the gases (uncondensed pyro gas) produced in the process are used as fuel for heating of reactor. The excess uncondensed pyro gas is either flared up or re-circulated for reactor heating or in some cases stored for subsequent usage. After the completion of process, the carbon black & steel wire left inside reactor are taken out. These products are unloaded from the reactor after purging the reactor with Nitrogen (N₂) gas.

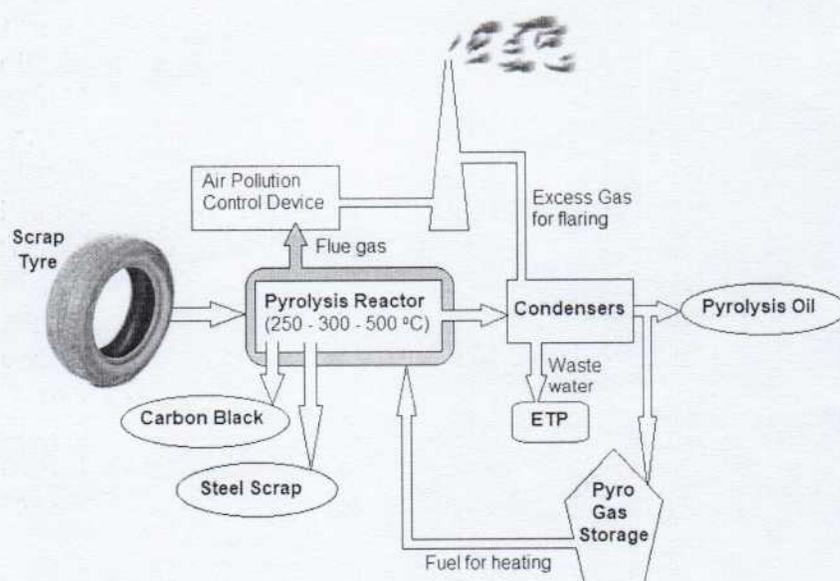


Fig: Schematic Representation of Tyre Pyrolysis process.

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A. Type of Tyre Pyrolysis Process

Batch Process: In the batch process feeding is done in a batch of few tons of waste tyres based on reactor's capacity. The feeding & unloading of reactors in batch process is carried out manually. In these plants the tyres are fed to the reactor manually and at the end of process the steel wire and carbon are taken out manually. A typical batch process functions as follows:

- i. Scrap Tyres whole and/or cut are packed densely into the reactor's chamber.
- ii. The reactor is heated up to 300°C to 500°C.
- iii. The generation of oil laden gas starts at 120°C to 150°C. The temperature of the reactor is maintained at 200°C for 2 to 2.5 hours. Then the temperature is further increased up to 250°C to 300°C and maintained for another 4-5 hours. In some cases, the operating temperature goes up to 500°C.
- iv. The bullet shaped reactor is rotated slowly at 0.5 – 2.0 revolution per minutes (RPM) during the process.
- v. The oil laden gases (C4 to C30) are passed through multiple condensers and the oil gets collected in receiver tanks under the condensers. After completion of process, the oil is taken to the final collection tank.
- vi. The uncondensed gas is fed to the reactor shell for continuous heating of the reactor. Excess uncondensed gas is either flared or re-circulated for reactor heating or stored.
- vii. Flaring system is provided for preventing leakage of unburnt gas in the environment.
- viii. Once the heating of reactor for conversion from solid to gas is over, the reactor is cooled down to 50°C, followed by reactor's purging using Nitrogen gas. carbon black is collected from the reactor by connecting the carbon chute tied with collection bag this operation starts after purging the reactor by nitrogen gas. Due to internal spiral arrangement, the carbon flows into the collection bag.
- ix. After removal of carbon black, the reactor door is opened for removal of steel scrap.
- x. The entire process takes around 24 to 36 hours.

Continuous Process: In the continuous tyre pyrolysis plant the feeding into reactor is continuous and at a uniform rate. A typical continuous plant functions as follows:

- i. In the continuous process, feeding is mechanical and continuous at the rate of approximately 300 to 450 kg per hour.
- ii. The feed is in the form of crumb of the size 20 to 25 mm and devoid of steel.
- iii. The length of reactor is 5 to 8 m and its diameter is 0.7 to 1.5 m.
- iv. The temperature of reactor varies from 350°C to 400°C. The oil is collected in tanks after condensing. Maximum generation of oil is reported during this temperature range only.
- v. The carbon black generated is continuously moved out of the reactor through a closed system screw conveyor.

B. Environmental Issues/Concerns at Tyre Pyrolysis Plants

- i. Spillage of carbon in the working area, when the door of reactor is opened;
- ii. Exposure of workers to fine carbon particles during opening of the reactor door;
- iii. Process emission due to escape of pyro gas which remains entrapped inside reactor vessel after completion of the process and their release into atmosphere with the opening of the main door of the reactor vessel;
- iv. Escape of pyro gas directly into atmosphere through emergency release valve due to increase of pressure in the reactor vessel;
- v. Not having flaring system for release of excess pyro gas or uncondensed gases;
- vi. Odor problem in plant and in the neighborhood due to leak from reactor, storage vessel;
- vii. Fugitive emission of charcoal/ fine carbon particle while removing from reactor vessel and its packing into the bags;

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- viii. Purged water from the water seal (oil –water separator) provided to separate the water vapour from the pyro gas containing oil traces; and
- ix. Spillage and floor washing containing charcoal particle and oil

C. Standard Operating Procedure (SoP) for Tyre Pyrolysis Plants

MoEF & CC vide its OM dated November 24, 2015 has notified standard operating procedures (SoPs) for tyre pyrolysis plants using scrap tyres. The SoPs have clearly specified on requisite facilities and standard operating procedures for the production of Tyre Pyrolysis Oil (TPO) from plants based on batch process and continuous process. Plants producing TPO using scrap tyres are required to comply with SoP. SoP needs revision in view of the findings of this study.

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4.0 STUDY PROTOCOL DESIGNED FOR CARRYING OUT FIELD MONITORING AND NUMBER & TYPE OF PLANTS TO BE STUDIED

A. Study Protocol

The study protocol to be followed for carrying out the studies at Tyre Pyrolysis Plants was finalized in consultation with IIT Delhi and NEERI Nagpur. The study protocol for carrying out the studies is given below:

- i. The monitoring of air quality will be carried out at work zone as well as in ambient air for the following parameters:
 - a) Work Zone Monitoring (to cover entire production cycle of Tyre Pyrolysis Plants i.e. feeding of reactor, pyrolysis of rubber, cooling period and unloading of reactor i.e. removal of carbon & steel) for PM₁₀, PM_{2.5}, CO, VOCs, B(α)P;
 - b) Ambient Air Quality Monitoring (24 hour monitoring) for PM₁₀, PM_{2.5}, B(α)P, VOCs.
- ii. For existing batch tyre pyrolysis plants monitoring to be carried out at work zone at the time of feeding waste tyre in the reactors and during opening of reactor for removal of carbon black powder & steel for comparison purpose.
- iii. Work Zone monitoring to be carried at two to four locations and should cover entire manufacturing process of Tyre Pyrolysis Plants i.e. feeding of reactor, pyrolysis of rubber, cooling period and unloading of reactor.
- iv. For ambient air quality, monitoring to be carried out for 24-hour time weighted average during operation of the plant at two to four locations.
- v. Detailed analysis of tyre pyrolysis oil (as per Schedule-V Part B of Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016) in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium+chromium+ nickel, PAH, Total halogens, PCBs, and water content.
- vi. Detailed compositional Analysis of Tyre Pyrolysis Oil w.r.t carbon number, specific gravity /density, acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson Carbon Residue), ash content, pour point, PONA (Paraffin, Olefins, Naphtha, Aromatics).
- vii. Assessment of temperature and pressure (mean as well as profiles), design parameters of the plants, incoming feed rate and product rate data from typical plants will also be analysed.
- viii. Locations and numbers of sensors /alarms.
- ix. Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire (questionnaire attached)
- x. Health assessment of workers through questionnaire (questionnaire attached).
- xi. Any other parameter of interest if found to be useful during the study may also be included.

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B. Type and Number of Plants Studied

- i. The studies were carried out at seven tyre pyrolysis plants. Out of which three plants were Existing Batch Tyre Pyrolysis Plants, three plants were Advance Batch Automated Tyre Pyrolysis Plants and one plant was Continuous Tyre Pyrolysis Plant. The details of plants are given in the table below

No.	Tyre Pyrolysis Plant	Type
1	M/s Pairan Pyrolysis Pvt. Ltd., Plot No. S-20, SIPCOT Industrial Complex, Ingur Village, Perundurai Taluk, Erode District, Tamil Nadu	Advance Batch Automated Tyre Pyrolysis Plants
2	M/s Excel Industries (Unit-2), Phase-1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, Kolhapur, Maharashtra.	
3	M/s. Narmada Industries, Manurethi Road, Siltara Phase-2, Raipur, Chhattisgarh.	
4	M/s S.G. Petrotech, Khewat No. 305, Ismaila 11-B, Ismaila Road, Tehsil Sampla, Rohtak, Haryana 124501	Existing Batch Tyre Pyrolysis Plants
5	M/s Tirath Ram & Co, (Unit – II), Kum Khurd Road, Sub. Tehsil – Kum Kalan, Ludhiana, Punjab.	
6	M/s Mahie Green Earth Product, Khasra No.194 Vill, Nara, 9 km, Meerut Road, Muzaffarnagar, UP - 251001,	
7	M/s Royal Carbon Black Pvt. Ltd., M/s Royal Carbon Black Pvt. Ltd., Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Village-Vanivali, Tal-Khalapur, Dist-Raigad, Maharashtra.	Continuous Tyre Pyrolysis Plant

- ii. The studies were coordinated by CPCB, HO, Delhi in consultation with expert members from IIT Delhi & NEERI Nagpur along with its Regional Directorates (Chennai, Pune & Bhopal).
- iii. Environmental issues prevailing in the plants during operations (loading of tyres, processing, condensation and unloading of carbon black and steel scrap). The studies also comprised of Work Zone Air Quality Monitoring, Ambient Air Quality Monitoring including detailed analysis of Tyre Pyrolysis Oil and Health & Odour surveys.

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5.0 FINDINGS IN TERMS OF STATUS OF ENVIRONMENTAL CONCERNS, HEALTH & ODOUR, WORK ZONE & AMBIENT AIR QUALITY AND COMMON PREVALENT PRACTICES & OBSERVATIONS DURING FIELD STUDIES CARRIED OUT AT SEVEN TYRE PYROLYSIS PLANTS:

Studies were carried out at seven (7) Tyre Pyrolysis Plants as per the protocol. Following are the findings of the study.

A. Status of Environmental Concerns at Tyre Pyrolysis Plants

1. Advance Batch Automated Tyre Pyrolysis Plants

- i. No significant visual fugitive emissions were observed while unloading of carbon black powder from the reactor in all the three advance batch automated tyre pyrolysis plants.
- ii. Nitrogen gas purging facility is provided to purge the pyrolysis gases trapped inside the reactor whenever reactor is shut down in all three advance batch automated tyre pyrolysis plants.
- iii. VOC meter and gas sensors have been provided to check the presence of any gas in the reactor.
- iv. PLC based bypass arrangement for bypassing the pyro gas was observed in the advance batch automated tyre pyrolysis plant at M/s. Excel Industries (Unit 2), Hatkanangale, Kolhapur.
- v. Arrangement for flaring of entire gas in case of emergency were provided in these plants.
- vi. Arrangement for storing of excess pyro gas in rubber balloon is provided at M/s Narmada Industries, Raipur, Chhattisgarh.
- vii. Arrangement has been made to prevent spillage and fugitive emission during removal of steel from reactors in terms of suction hood, dust collectors, industrial vacuum cleaners, side barriers and water sprinkler system.
- viii. The purged water has been collected and carried to ETP where it is treated in a multi-step process to remove oil and carbon from the water. The treated water is reused in plant.
- ix. All three advance batch automated tyre pyrolysis plants have been provided with closed loop system for oil, so that chances of oil spillage is minimal.
- x. No major odour issues were identified during the study in all three advance batch automated tyre pyrolysis plants. Maximum odor observed was 4 in scale of 1 to 10 at plant shed area in M/s Excel Industries (Unit 2), Hatkanangale, Kolhapur.
- xi. Workers have been provided proper Personnel Protective Equipment (PPE) such as helmet, mask, gloves, boots in all three advance batch automated tyre pyrolysis plants.

From the above it is observed that the Advance Batch Automated Tyre pyrolysis plants are able to address the environmental concerns.

2. Existing Batch Tyre Pyrolysis Plants

- i. Fugitive emission was observed from hatch door in existing batch tyre pyrolysis plants at M/s S.G. Petrotech, Dist. Rohtak Haryana and M/s Mahie Green Earth Product, Muzaffarnagar, Uttar Pradesh. Also the carbon storage room was not properly sealed resulting into carbon spillage around the area in these two plants.
- ii. Fugitive emissions (from combustion of fuel) from outer jacket of the reactor was observed at M/s Mahie Green Earth Product, Muzaffarnagar, Uttar Pradesh. No

visible fugitive emission was observed at M/s Tirath Ram & Co (Unit-II), Kum Khurd Road, Ludhiana, Punjab.

- iii. No arrangement for Nitrogen purging in the reactor was found at all three existing batch tyre pyrolysis plants which will lead to escape of pyro gas entrapped inside reactor vessel during opening of the main door of the reactor vessel after completion of process.
- iv. Fugitive emission of carbon in an around the reactor area were observed at existing batch tyre pyrolysis plants in Haryana and Uttar Pradesh.
- v. Spillage of carbon and fugitive emission observed during unloading of carbon black powder from reactor as well as from the carbon storage room/ tank area at existing batch tyre pyrolysis plants in Haryana and Uttar Pradesh.
- vi. Bagging was done manually at existing batch tyre pyrolysis plants in Haryana and Uttar Pradesh. However, at tyre pyrolysis plant in Punjab, unloading of carbon black powder from storage tank to the bags was through screw conveyor but bagging was manual. Spillage of carbon black powder was noticed during bagging.
- vii. Arrangement for flaring of excess pyro gas and flaring entire gas in case of emergency were provided at existing batch tyre pyrolysis plants in Haryana and Punjab. However, no such facility was provided by M/s Mahie Green Earth Product, Muzaffarnagar, Uttar Pradesh.
- viii. Purge water treatment was not observed at the existing batch tyre pyrolysis plants. An ETP was installed at existing batch Tyre Pyrolysis Plants unit in Haryana for treatment of process waste water generated from scrubbers and condensers. The water from floor cleaning is also treated in the ETP. However, no ETP was installed at existing batch Tyre Pyrolysis Plants at Punjab and Uttar Pradesh.
- ix. All three existing batch Tyre Pyrolysis Plants have been provided with closed loop system for oil, so that chances of oil spillage is reduced.
- x. During the inspection, odour in the scale of 5 was observed when rated in the scale of 1 to 10 in plant shed area at tyre pyrolysis unit at Uttar Pradesh and in scale of 4 at tyre pyrolysis unit at Haryana. However, no odor has been felt at Tyre Pyrolysis Plant at Punjab. In case of Punjab the reactor was cooled for nearly 16 hours which may have resulted into no odour.
- xi. Workers are provided proper Personnel Protective Equipment (PPE) such as Helmet, mask, gloves, and boots at existing batch Tyre Pyrolysis Plants in Haryana and Punjab. However, at M/s Mahie Green Earth Product, Muzaffarnagar, Uttar Pradesh only mask and boots were provided to workers.

From the above it is observed that the Existing Batch Tyre Pyrolysis Plants need modifications and improvements in operation for addressing the environmental concerns.

3. Continuous Tyre Pyrolysis Plant

- i. No visual fugitive emission was observed while unloading of carbon black powder from the reactor in continuous pyrolysis plant.
- ii. The workers of the unit were observed using PPE such as safety shoes, helmets, and ear plugs.
- iii. Nitrogen gas purging facility is provided to purge the pyrolysis gases trapped inside the reactor whenever reactor is shut down. Nitrogen gas is supplied from the in-house PSA based Nitrogen plant (capacity - 25 Nm³/h).
- iv. A bypass pipeline arrangement has been made from the pipeline of Heavy Oil fraction in the vertical separator to facilitate the oil/uncondensed gases from the

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- Reactor to directly enter into the heavy oil condensation tank in the event of choking/blockage in the condensers.
- v. There are 12 nos. of Methane gas detection sensors have been installed inside the pyrolysis shed. These sensors are connected to Light Alarm System in the control panel of each Tyre Pyrolysis Reactor (TPR).
 - vi. During the study period, the CPCB and NEERI officials did not observe any impact on the health (like eye irritation, nausea, headache, etc.) while working in the plant. However, odor was felt in the pyrolysis shed to the scale of 1-2 (when rated at scale of 10) and scale of 0-1 at various other locations of the plant premises.
 - vii. The carbon generated in the reactors is conveyed to a dispenser through an inclined enclosed screw conveyor. Carbon powder from dispenser is filled in the jumbo bags, fastened and moved to the storage area with the help of trolley. Each fully filled jumbo bag weighs about 550 kg. The common enclosed air tight screw conveyor is connected to a dust collection system outside the pyrolysis shed and there is vent of 12 m height. The dust collection system consists of 64 bag filters.
 - viii. The unit has installed an Effluent Treatment Plant (ETP) of capacity 0.5 KLD. It has a Chemical Dosing Tank /Neutralization Tank, Settling Tank, Sludge collection tank, Carbon Filter and treated water collection tank. The treated water is used for gardening within the plant premises.
 - ix. The water from packed bed scrubber, caustic tank and other sources are treated in the ETP.
 - x. Some spillage of carbon powder on the roads within the premise and on the floor of pyrolysis shed during collection of carbon powder in the jumbo bags was observed. Also some spillage of leachate containing carbon powder from tyre crumbs storage yard were observed surfacing on roads.

From the above it is observed that the Continuous Tyre Pyrolysis Plant is able to address the environmental concerns.

B. Status of Health & Odour Issues

- i. Odour issues have not been reported majorly. However, CPCB team has felt odour issues in some of the locations in both advance batch automated tyre pyrolysis plants and existing batch tyre pyrolysis plants and have given them rating from 1 to 5 when rated in the scale of 1 to 10.
- ii. No health issues have been reported either by workers or by nearby residents except odor and health issues reported by some of the residents nearby M/s Mahie Green Earth Products, Muzaffarnagar, Uttar Pradesh.
- iii. CPCB & NEERI team also did not observe any short term health issues while carrying out studies at different plants.

C. Status of Work Zone and Ambient Air Quality

In addition to the environmental concerns and health & odour survey, air quality monitoring for work zone as well as ambient air were also carried out during the studies of seven tyre pyrolysis plants as per the study protocol.

The main findings of monitoring of work zone air quality are given below:

- i. In the advance automated tyre pyrolysis plants the values of CO, B(α)P and TVOCs/BTX are BDL/BLQ or within permissible exposure limits (PEL) of OSHA or Indian Factory Act 1948.

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- ii. In the existing batch tyre pyrolysis plants the values of CO & B(α)P are BDL/BLQ. The values of TVOCs (BTX) are generally exceeding PEL of OSHA or Indian Factory Act 1948.
- iii. The work zone air quality at advance automated tyre pyrolysis plants and continuous plants are within PEL OSHA or Indian Factory Act 1948 for TVOCs/(BTX), whereas work zone air quality at existing batch tyre pyrolysis plants are exceeding PEL for BTX.

The main findings of monitoring of ambient air quality are given below:

- i. In the advance automated tyre pyrolysis plants the values for PM₁₀ and PM_{2.5} were within NAAQS and values of CO and B(α)P were BDL/BLQ. .
- ii. In case of advance automated tyre pyrolysis plant for M/s Narmada Industries the values of PM₁₀ and PM_{2.5} are exceeding the limits but it was observed that this unit is surrounded by sponge iron plants and power plants, which might have contributed in increased result.
- iii. In the existing batch tyre pyrolysis plants, the values of PM₁₀ were exceeding NAAQS in most of the plants and values of PM_{2.5} was exceeding at two plants. Values of B(α)P were BDL/BLQ in all the plants. The values of Benzene were on higher side.
- iv. In the continuous tyre pyrolysis plant the parameters monitored for ambient air quality were within NAAQS.
- v. The ambient air quality at continuous and advance automated tyre pyrolysis plants are within NAAQS where at existing batch plants the values mostly exceeding the NAAQS.

The detailed monitoring results in reference of work zone and ambient air quality is at Appendix-I.

D. Common Prevalent Practices in the Tyre Pyrolysis Plants

- i. Whole or cut tyre in two pieces are used in the reactor as raw material. It was informed that when smaller pieces/or crumb of waste tyres, devoid of steel are fed into the existing batch reactor, the rate of reaction increases, resulting in excessive generation of gas which is risky.
- ii. It was also informed that steel devoid small tyre pieces also result in choking /blocking of existing batch reactor gas exit point. Presence of steel in the tyre helps retain the large size of tyre in elongated shape till the last stage of pyrolysis. Small pieces of tyre can move while rotation of reactor drum and enter the exit pathway. Steel helps in scrapping the sticky material in the inner side of the reactor and is very useful in the process.
- iii. In the existing batch tyre pyrolysis plants, the feeding of raw material into the reactor is mostly manual.
- iv. In tyre pyrolysis plants purge water (oil mix water) gets generated which is used for initial heating as it has a calorific value around 2500 Kcal/Kg. In some plant this purge water is mixed with carbon black powder and the pallets so made are sold.

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E. Observations

1. It is observed that **the so-called advance batch automated tyre pyrolysis plants are plants with advance features for safety, operation controls and pollution control in comparison to existing batch tyre pyrolysis plants.** The advance batch automated plants have following features:
 - i. Programme Logic Controller (PLC) based auto activation for cutting of gas supply to the burner and for switching off the burners in case of increase of pressure and temperature inside the reactor.
 - ii. PLC based auto activation of bypass arrangements for bypassing the pyro gas from reactor to primary oil tank connected to various condensers, uncondensed gas collection tank and flaring system in case of blocking/chocking of outlet vent inside the reactor or direct bypass for flaring
 - iii. PLC based system for control of temperature and pressure inside the reactor
 - iv. PLC based gas sensors connected with sirens (hooters) in case of release of gases (Methane and Carbon monoxide)
 - v. Unloading and bagging of carbon black powder jointly through mechanical and manual means with minimal spillage and fugitive emission
 - vi. Suction hood over the gate of reactor and water sprinkling system for prevention of fugitive emission during unloading of carbon black, opening of the gate, and unloading of steel scrap.
 - vii. Closed chamber with suction hood and underground storage before the gate of reactor for unloading of carbon black and arrangement for transfer of carbon black through screw conveyor for bagging
 - viii. Arrangement of Nitrogen purging of the reactor
 - ix. Arrangement for storage of Pyro gas
 - x. These plants can handle all type waste tyres.
2. M/s Pairan Pyrolysis Pvt. Ltd., Erode, Tamil Nadu, M/s Excel Industries (Unit-2), Kolhapur, Maharashtra and M/s Narmada Industries, Raipur, Chhattisgarh are the Tyre Pyrolysis Plants having features of advance batch automated plants and meet the environmental concerns.
3. Each of the above advance batch automated tyre pyrolysis plants are having some unique feature in comparison to each other. These plants are able to address environmental concerns.
4. The existing batch tyre pyrolysis plants are first generation pyrolysis plants and have only basic operational controls which led to many of the environmental concerns.
5. M/s S.G. Petrotech Rohtak, Haryana, M/s Tirath Ram and Co (Unit-II), Ludhiana, Punjab and M/s Mahie Green Earth Product, Muzaffarnagar, Uttar Pradesh do not have the above features like PLC based operation, bypass arrangement for pyro gas, gas sensors, sirens, and mechanical means of carbon black unloading. Due to absence of these features, these plants are called existing batch tyre pyrolysis plants.

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6. The existing batch tyre pyrolysis plants need to have the features of advance batch automated tyre pyrolysis plants to meet the environmental concerns. These plants require modifications and improvement in operation control mechanism.
7. The existing batch tyre pyrolysis plants have issues with regard to fugitive emission, spillage of carbon black powder, spillage and fugitive emission during unloading of carbon black and steel scrap and release of pyro gas into the atmosphere.
8. M/s Royal Carbon Black Pvt. Ltd., Raigad, Maharashtra is a continuous tyre Pyrolysis Plant and meet the environmental concerns.
9. It is observed that the advance batch automated tyre pyrolysis plant at Raipur; Chhattisgarh has higher levels of PM₁₀ and PM_{2.5}. However, the reason for high levels cannot be attributed to one-day operation of Tyre Pyrolysis Plant as the area is surrounded by several sponge iron plants, which are known to cause particulate matter (PM) pollution. Other parameters such as VOCs, CO and B(α)P are within limits.
10. It is observed that in existing batch tyre pyrolysis plants namely M/s S.G. Petrotec, Rohtak, Haryana and M/s Mahie Green Earth Product, Muzaffarnagar, Uttar Pradesh, the value of PM₁₀ and PM_{2.5} and VOCs are on higher side in ambient air and in the work zone.
11. The existing batch tyre pyrolysis plants do not have safety features and have issues of fugitive emission, spillage and escaping of pyro gas, etc. The existing tyre pyrolysis plants do not have gas sensors and do not carry out Nitrogen (N₂) purging before opening of the reactor's gate in most of the cases.
12. The issue of fugitive emissions & spillage of black carbon are prominent in existing batch tyre pyrolysis plants.
13. For initial heating purpose different fuels are being used. M/s Pairan Pyrolysis Pvt. Ltd. and M/s Excel Industries were using oil emulsion. M/s Narmada Industries is using pyro gas stored in rubber balloon, M/s Royal Carbon Black Pvt. was using light oil fraction of Tyre Pyrolysis Oil (TPO), M/s S.G. Petrotech was using natural gas (LPG) and M/s Tirath Ram and Co (Unit-II) and M/s Mahie Green Earth Product were using wood.
14. The yield of Tyre Pyrolysis Oil (TPO) is more or less same in continuous, advance & existing batch processes. The calorific value of TPO is very high. The calorific values observed in advance batch automated plants are 6347 Kcal/kg, 9100 Kcal/kg and 10265 Kcal/kg. The calorific value observed in existing batch Tyre Pyrolysis Plants are 9120 Kcal/kg, 9926.38 Kcal/Kg and 7003 Kcal/Kg. In the continuous Tyre Pyrolysis plant the calorific values observed are 7560 kcal/kg for heavy fraction and 7610 kcal/kg for light fraction.
15. Tyre Pyrolysis Oil (TPO) has low sulphur content in the range of 0.87% to 1.28%, Ash content 0.087% wt., total halogen in the range of 146.27 ppm to 287.4 ppm. The carbon number varies from C₄ – C₃₀, flash point 52°C to 54°C, boiling range from 66.4°C to 312°C, sediment ranges from 0.002% to 0.0063% wt., PONA ranges from 69.53% to 70.87% v/v, pour points varies from – 30°C to -6°C, Conradson carbon residue ranges from 0.62% to 3.41% and kinematic viscosity at 40°C ranges from 3.67 to 6.12.

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6.0 CONCLUSIONS OF THE STUDY ON ADEQUACY OF TYRE PYROLYSIS PLANTS TO MEET ENVIRONMENTAL CONCERNS

- i. Advance batch automated tyre pyrolysis plants are plants with advance features for safety, operation controls and pollution control in comparison to existing batch tyre pyrolysis plants and are upgraded version of existing batch tyre pyrolysis plants.
- ii. Advance batch automated tyre pyrolysis plants are found to meet environmental issues/concerns identified in the earlier report submitted by CPCB to the Hon'ble NGT (PB) in the matter of OA No. 400 of 2019.
- iii. The advanced batch automated plants are able to meet environmental concerns, as the plants were run under continuous supervision and by strictly adhering to SoPs.
- iv. The existing batch tyre pyrolysis plants are first generation pyrolysis plants and have only basic operational controls which led to many of the environmental issues / concerns.
- v. The advance batch tyre pyrolysis process and continuous tyre pyrolysis process had demonstrated compliance with regard to work zone limits and no significant impact on ambient air quality.
- vi. Existing Batch Tyre Pyrolysis Plants need additional features like PLC based control arrangement, by pass arrangement for pyro gas, installation of gas sensors, pressure, temperature gauges at reactor & storage tank, alarm system, facility for flaring of entire pyro gas during emergency, arrangement for re-circulation of pyro gas for reactor's heating, suction hoods over the gate of reactor, sprinkler system for control of fugitives and mechanized arrangement for unloading of carbon black powder and arrangement of nitrogen purging etc. to meet the environmental concerns.
- vii. Odour in the tyre pyrolysis plants are due to leakage from the pipe lines of oil & gas and due to storage of purge water (oil mixed water).
- viii. The yield and calorific values of Tyre Pyrolysis Oil is more or less same in continuous, advance & existing batch process.
- ix. Tyre Pyrolysis Oil (TPO) has high calorific value in the range of 6300 Kcal/kg to 10200 Kcal/kg and low sulphur content in the range of 0.87% to 1.28%, Ash content 0.087% wt., total halogen in the range of 146.27 ppm to 287.4 ppm. The carbon number varies from C4 – C30, flash point 52°C to 54°C, boiling range from 66.4°C to 312°C, sediment ranges from 0.002% to 0.0063% wt., PONA ranges from 69.53% to 70.87% v/v, pour points varies from – 30°C to -6°C, Conradson carbon residue ranges from 0.62% to 3.41% and kinematic viscosity at 40°C ranges from 3.67 to 6.12.
- x. The value of sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content in the TPO is well within the limits specified for fuel oil obtained from the recycling of waste oil and mentioned in the schedule V Part B of Hazardous & Other waste (M&TM) Rules 2016)
- xi. Health issues have not been reported during the study except at the unit M/s Mahie Green Earth Product, Muzaffarnagar, UP.

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7.0 RECOMMENDATIONS OF THE STUDY ON ADEQUACY OF TYRE PYROLYSIS PLANTS TO MEET ENVIRONMENTAL CONCERNS

- i. All the existing batch Tyre Pyrolysis Plants to install additional features like PLC based control arrangement, bypass arrangement for pyro gas from reactor door to primary condenser, installation of gas sensors, pressure, temperature gauges at reactor & storage tank, alarm system, flaring of entire pyro gas during emergency, arrangement for re-circulation of pyro gas for reactor's heating, provision for flaring of pyro gas, suction hoods over the gate of reactor and carbon black powder bagging area, water sprinkler system and mechanized arrangement for removal of carbon black powder and steel scrap and arrangement of Nitrogen(N₂) purging.
- ii. Initial firing of reactor and heating of the reactor to be done either by using pyro gas generated by the plant itself or by use of purge water (oil mix water)/oil water emulsion, or by tyre pyrolysis oil or any other fuel approved by concerned SPCBs /PCCs. After generation of pyro gas, the same is to be used for the purpose of heating reactor. Plants to install adequate APCD for controlling flue gas emissions.
- iii. Feed to tyre pyrolysis plants has to be full waste tyre or two piece cut waste tyre with steel for better operational control in existing batch tyre pyrolysis plant.
- iv. It has been observed that unloading of steel scrap from the reactor results into spillage of carbon black around the reactor area and generates fugitive emission. Plants to ensure no such spillage occurs by using suitable trays with wheels for transporting the steel scrap within the premise from generation points to storage points. This operation can be made cleaner by use of vacuum cleaner after each batch operation.
- v. Unloading of carbon black powder from the reactor should be done under controlled conditions through a pneumatic /screw conveyor system in such a manner that the contents of the reactor are not open to the atmosphere at any point of time. The end of the conveyor system shall be attached to a bagging plant where all the carbon black powder will be bagged in the HDPE bags with proper sealing.
- vi. Suction hood to be installed above door of the reactor. Suction hood also to be installed at the transfer points across the work zone such as at carbon black powder bagging area etc. to control fugitive emissions. All suction hood to be connected to centralized bag filters /wet scrubber attached with stack of 30 m height (installed for control of flue gas emissions).
- vii. Water sprinklers to be installed at the transfer points for arresting fugitives.
- viii. Tyre Pyrolysis Plants to install ETP for proper treatment of waste water generated. Also plants to ensure that treated water be re-used in unit itself & there is zero effluent discharge in all the Tyre Pyrolysis Plants.
- ix. The transportation of Carbon Black and Tyre Pyrolysis Oil (TPO) should strictly be done in closed vehicles to ensure that there is no spillage of carbon black or TPO during their transportation.
- x. All Tyre Pyrolysis Plants to carry out annual health check-up of all the employees working in the unit & submit its report to concerned SPCBs /PCCs on annual basis.

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- xi. SPCBs /PCCS to carry out vigilance & randomly inspect Tyre Pyrolysis Plants @ 25% of total Tyre Pyrolysis Plants per annum in their respective States /UTs and submit their compliance reports quarterly and annually to CPCB.
- xii. SPCBs /PCCs while granting consent to establish & operate a new Tyre Pyrolysis Plants only after assessing the area of the plant premises where unit is proposed. The area of the plant premises carry more weightage as the emission from tyre pyrolysis unit does not affect far away community, instead it is the immediate neighborhood that is affected. Black carbon, being large size particle is accidentally spilled over in the plant premises during its handling and therefore cannot travel to larger distance under the influence of wind. Odor remains a nuisance to the nearby residential and industrial area. In case of existing plants seeking expansion of processing capacity, the same may also be granted only after plant area is found sufficient. CPCB will issue guidelines on area of the plant premises accordingly within ten months.
- xiii. CPCB to revise SoP and prepare guidelines for both existing batch and continuous tyre pyrolysis plant and its process within ten months.

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Detailed Findings – Work Zone and Ambient Air Quality**A. Work Zone Air Quality:**

Sampling and analysis of parameters were carried out for PM₁₀, PM_{2.5}, CO, VOCs, B(α)P. For work zone, the measured parameters were compared against the **permissible exposure limits (PEL)** as under the Factories Act of 1948 or OSHA exposure limits. For work zone permissible exposure limits are available for CO, benzene, toluene and xylene (BTX) and B(α)P (under OSHA) only. For PM₁₀ and PM_{2.5} there is no PEL under Factories Act 1948 or under OSHA. The plant wise monitoring results are given below:

1. Advance Batch Automated Tyre Pyrolysis Plants – Work Zone Air Quality

The value of CO and B(α)P for all the three plants are either BDL or BLQ or within PEL. The value of Benzene, Toluene and Xylene is within PEL in case of M/s Pairan Pyrolysis Pvt. Ltd. In case of M/s Excel Industries (Unit-2) and M/s Narmada Industries only Total Volatile Organic Compounds (TVOCs) was monitored and found to be in the range of 0.00002 to 1.0 ppm. Values of PM₁₀ and PM_{2.5} were on lower side in case of M/s Pairan Pyrolysis Pvt. Ltd and M/s Excel Industries (Unit-2). However, in case of M/s Narmada Industries the values were on higher side. The detailed results are given in the Table 1 below:

Table 1

No.	Name of the Industry	Location	Parameters (8 hours monitoring)						
			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	CO mg/m ³	VOCs (ppm)			B(α)P ng/m ³
						Benzene	Toluene	Xylene (o,p,m)	
1	M/s Pairan Pyrolysis Pvt. Ltd., Erode, Tamil Nadu	Location1	39.99	17.3	BDL	0.0007	0.1313	0.0018	-
		Location2	30.11	12.99	BDL	0.0000	0.0042	0.0007	BLQ
		Location3	17.2	8.33	BDL	0.0000	0.0056	0.0011	-
		Location4	25.2	16.3	BDL	0.0000	0.0205	0.0076	BLQ
		Location5	-	-	BDL	0.0000	0.0052	0.0022	-
		Location6	-	-	BDL	0.0005	0.0886	0.0024	-
2	M/s Excel Industries (Unit-2), Kolhapur	Location1	56.3	22.6	<1	TVOCs :0.1 to 0.5			<2
		Location2	58.1	22.9	<1	TVOCs: 0.4 to 1.0			<2
		Location3	55.4	22.1	<1	TVOCs: 0.2 to 0.5			<2
3	M/s Narmada Industries, Raipur	Location1	168	57	0.572	TVOCs: 0.00002			BDL
		Location2	232	69	0.634	TVOCs:0.00003			BDL
		Location3	191	62	0.59	TVOCs:0.00002			BDL
Standard OSHA			NA	NA	50	1	200	100	0.2
Indian Factory Act 1948			NA	NA	40	10	100	100	NA

2. Existing Batch Tyre Pyrolysis Plants – Work Zone Air Quality

The value of CO for all the three plants are either BDL or within PEL. The value of Toluene is within PEL for M/s. Tirath Ram and Co. (Unit-II) and M/s. Mahie Green Earth Product and exceeding at one location for M/s. S.G. Petrotec. The value of Benzene is within PEL for M/s. Tirath Ram and Co. (Unit-II) and exceeding at one location each for M/s S.G. Petrotec and M/s Mahie Green Earth Product. The value of Xylene is within PEL in case of M/s Tirath Ram and Co. (Unit-II) and exceeding for M/s S.G. Petrotec and M/s Mahie Green Earth Product.

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Table -2

No.	Name of the Industry	Location	Parameters (24 hour monitoring)						
			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	CO mg/m ³	VOCs (ppm)			B(α)P ng/m ³
						Benzene	Toluene	Xylene (o,p,m)	
1	M/s S.G. Petrotec, Rohtak, Haryana	Location1	166.4	95.54	10.82	2.88	36.74	167.73	0.098
		Location2	237.21	196.9	13.58	4.23	53.12	197.33	0.92
		Location3	291.08	241.47	26.10	16.82	286.98	421.51	1.14
		Location4	261.94	208.24	9.18	3.28	68.99	191.29	0.96
2	M/s Tirath Ram and Co. (Unit-II), Ludhiana, Punjab	Location1	136.82	89.55	3.66	0.74	8.10	22.13	0.088
		Location2	110.12	79.84	3.45	0.68	6.42	39	BDL
		Location3	92.14	42.23	4.86	0.65	15.10	57.9	BDL
		Location4	172.94	110.05	6.44	0.84	20.14	52.22	0.089
3	M/s Mahie Green Earth Product, Muzaffargarh Nagar, UP	Location1	111.88	87.06	6.2	9.11	67.09	180.64	BDL
		Location2	191.28	120.97	6.2	12.04	84.1	226.68	BDL
		Location3	133.33	62.43	6.13	8.25	88.94	155.39	BDL
		Location4	167.07	92	5.93	8.66	74.92	119.26	BDL
Standard OSHA			NA	NA	50	1	200	100	0.2
Indian Factory Act 1948			NA	NA	40	10	100	100	NA

3. Continuous Tyre Pyrolysis Plants – Work Zone Air Quality

The value of CO is less than 2.0 mg/m³ and B (α) P is less than 1.0 ng/m³. Only Total Volatile Organic Compounds (TVOCs) was monitored and found to be in the range of 0.1 to 0.4 ppm. The values of PM₁₀ and PM_{2.5} obtained during monitoring are on lower side. The detailed results are given in the table -3 below:

Table -3

No.	Name of the Industry	Locations	Parameters (8 hours monitoring)						
			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	CO mg/m ³	TVOCs (ppm)			B(α)P ng/m ³
						Benzene	Toluene	Xylene	
1	M/s Royal Carbon Black Pvt. Ltd., Raigad, MH	Location1	63.6	26.1	<2.0	0.1 to 0.4 (Avg. value 0.24)			<1.0
		Location2	61.4	24.7	<2.0	0.1 to 0.2 (Avg. value 0.13)			<1.0
Standard OSHA			NA	NA	50	NA			0.2
Indian Factory Act 1948			NA	NA	40	NA			NA

B. Ambient Air Quality

Sampling and analysis of parameters were carried out as per the protocol and compared with NAAQS.

1. Advance Batch Automated Tyre Pyrolysis Plants - Ambient Air Quality

- The ambient air quality monitored around the Advance Batch Automated Tyre Pyrolysis Plants namely M/s Pairan Pyrolysis Pvt. Ltd., Erode, Tamil Nadu and M/s Excel Industries (Unit-2), Kolhapur, Maharashtra is within permissible limits as prescribed under national ambient air quality standard for PM₁₀, PM_{2.5} & CO.
- However, at M/s Narmada Industries, Siltara, Raipur, Chhattisgarh the PM₁₀ values are exceeding the limits at both the monitored locations and PM_{2.5} value is exceeding at one location. As per the study report, there are several sponge Iron plant in the vicinity. Industries namely M/s. Indra Metal Works, two Sponge Iron plant namely M/s. SKS Ispat, and M/s. Gagan Ispat, Sponge Iron Plant and a power plant namely M/s. Jagdamba Power are very close to M/s Narmada Industries and they might have contributed in increase in the monitored value.

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iii. Monitoring for VOCs and B(α)P were also carried out at above three plants. Values of benzene were found to be less than value of annual prescribed standard. Values of B(α)P were BDL /BLQ. The detailed results are given in the Table 4 below:

Table 4:

No.	Name of the Industry	Locations	Parameters (24 hourly monitoring) <small>(24 hourly monitoring)</small>						
			PM ₁₀ $\mu\text{g}/\text{m}^3$	PM _{2.5} $\mu\text{g}/\text{m}^3$	CO mg/m^3	VOCs ($\mu\text{g}/\text{m}^3$)			B(α)P ng/m^3
						Benzene	Toluene	Xylene	
1	M/s Pairan Pyrolysis Pvt. Ltd., Erode, Tamil Nadu	Location1	56.4	22.8	BDL	0.000	105.5	11.65	BLQ
		Location2	55.5	20.4	BDL	0.000	16.24	28	BLQ
2	M/s Excel Industries (Unit-2), Kolhapur, Maharashtra	Location1	52.6	20.46	BLQ	TVOCs: 229.4 to 458.8			BLQ
		Location2	57.1	24.3	BLQ	TVOCs: 229.4 to 688.3			BLQ
		Location3	54.5	21.8	BLQ	TVOCs: 229.4 to 458.8			BLQ
3	M/s Narmada Industries, Raipur, Chhattisgarh	Location1	169.38	54.02	-	TVOCs: 0.111			BDL
		Location2	310.67	72.15	-	TVOCs: 0.132			BDL
NAAQS Standard			100	60	4 (8 hr)	5 (Annual)	NA	NA	1 (Annual)

2. Existing Batch Tyre Pyrolysis Plants - Ambient Air Quality

- i. In M/s S.G. Petrotec, Rohtak, Haryana, the values of PM₁₀ is 124.21 $\mu\text{g}/\text{m}^3$, 113.64 $\mu\text{g}/\text{m}^3$, 96.7 $\mu\text{g}/\text{m}^3$ and 173.66 $\mu\text{g}/\text{m}^3$ respectively and is exceeding the NAAQS at three out of four locations. The values of PM_{2.5} is 58.04 $\mu\text{g}/\text{m}^3$, 53.9 $\mu\text{g}/\text{m}^3$, 58.61 $\mu\text{g}/\text{m}^3$ and 104.72 $\mu\text{g}/\text{m}^3$ respectively and is exceeding the NAAQS at one location.
- ii. In the plant of M/s Tirath Ram and Co. Ludhiana, Punjab, the values of PM₁₀ is 94.14 $\mu\text{g}/\text{m}^3$, 121.41 $\mu\text{g}/\text{m}^3$, 115.05 $\mu\text{g}/\text{m}^3$ and 126.44 $\mu\text{g}/\text{m}^3$ respectively and is exceeding the NAAQS at three locations. The values of PM_{2.5} is 52.88 $\mu\text{g}/\text{m}^3$, 84.34 $\mu\text{g}/\text{m}^3$, 67.29 $\mu\text{g}/\text{m}^3$ and 98.88 $\mu\text{g}/\text{m}^3$ respectively and is exceeding the NAAQS at three locations.
- iii. In the plant of M/s Mahie Green Earth Product, Muzaffarnagar, U.P., the values of PM₁₀ is 152.31 $\mu\text{g}/\text{m}^3$, 107.33 $\mu\text{g}/\text{m}^3$, 108.70 $\mu\text{g}/\text{m}^3$ and 96.66 $\mu\text{g}/\text{m}^3$ respectively and is exceeding the NAAQS at three locations. The values of PM_{2.5} is 33.16 $\mu\text{g}/\text{m}^3$, 50.03 $\mu\text{g}/\text{m}^3$, 53.99 $\mu\text{g}/\text{m}^3$ and 45.80 $\mu\text{g}/\text{m}^3$ respectively and is within the NAAQS at all the locations.
- iv. In all three existing batch Tyre Pyrolysis Plants, VOCs have been analyzed in the terms of BTX i.e. Benzene, Toluene & Xylene. The values of Benzene appear to be on higher side at all the location at M/s S.G. Petrotec, Rohtak, Haryana. For M/s Tirath Ram and Co. Ludhiana, Punjab, levels of Benzene is on higher side at one location. For M/s Mahie Green Earth Product, Muzaffarnagar, U.P., the levels of Benzene is on higher side at two locations. The benzene levels ranged between 1.88 $\mu\text{g}/\text{m}^3$ to 13.56 $\mu\text{g}/\text{m}^3$. These values are 24 hour values where as standard is annual average.
- v. The levels of Benzo (a) Pyrene were below detection limit at all three existing batch Tyre Pyrolysis Plants. The detailed results are given in the Table 5 below:

Anand Kumar

Table 5:

No.	Name of the Industry	Locations	Parameters (24 hour monitoring)					B(α)P ng/m ³
			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	VOCs (µg/m ³)			
					Benzene	Toluene	Xylene	
1	M/s S.G. Petrotec, Rohtak, Haryana	Location1	124.21	58.04	7.27	24.68	5.31	BDL
		Location2	113.64	53.9	5.88	11.13	10.1	BDL
		Location3	96.57	58.61	8.11	68.19	152.2	BDL
		Location4	173.66	104.72	13.56	24.92	95.75	BDL
2	M/s Tirath Ram and Co. (Unit-II), Ludhiana, Punjab	Location1	94.14	52.88	1.88	2.92	2.38	BDL
		Location2	121.41	84.34	3.89	5.54	3.6	BDL
		Location3	115.05	67.29	4.92	19.85	47.31	BDL
		Location4	126.44	98.88	8.44	18.52	71.77	BDL
3	M/s Mahie Green Earth Product, Muzaffargarh Nagar, UP	Location1	152.31	33.16	6.99	44.12	61.99	BDL
		Location2	107.33	50.03	8.24	39.82	95.29	BDL
		Location3	108.70	53.99	3.91	13.06	21.92	BDL
		Location4	96.66	45.8	4.22	15.69	8.27	BDL
NAAQS Standard			100	60	5 (Annual)	NA	NA	1 (Annual)

3. Continuous Tyre Pyrolysis Plants-Ambient Air Quality

- i. The value of PM₁₀ and PM_{2.5} were within permissible limits of NAAQS in case of the Continuous Tyre Pyrolysis Plant namely M/s Royal Carbon Black Pvt. Ltd., Raigad, Maharashtra.
- ii. The value of CO was less than 2.0 mg/m³ and B(α)P was less than 1.0 ng/m³. TVOCs was in the range of 0.1 to 0.3 ppm. The detailed results are given in the Table -6 below:

Table 6:

No.	Name of the Industry	Location	Parameters (24 Hour Monitoring)					B(α)P ng/m ³	
			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	CO mg/m ³	TVOCs (ppm)			
						Benzene	Toluene		Xylene
1	M/s Royal Carbon Black Pvt. Ltd., Raigad, Maharashtra	Location1	56.3	20.8	<2.0	0.1 to 0.2 (Avg. value 0.11)			<1.0
		Location2	59.1	23.5	<2.0	0.1 to 0.3 (Avg. value 0.18)			<1.0
		Location3	60.7	24.2	<2.0	0.1 to 0.3 (Avg. value 0.14)			<1.0
NAAQS Standard			100	60	5 (Annual)	NA			1 (Annual)

Anand Kumar

Item No. 05

Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI**

Original Application No. 400/2019
(I.A. No. 403/2019, I.A. No. 611/2019, I.A. No. 615/2019 & I.A. No.
08/2020)

(With reports dated 18.12.2019 & 03.01.2020)

Social Action for Forest & Environment (SAFE)

Applicant(s)

Versus

Union of India & Ors.

Respondent(s)

Date of hearing: 06.01.2020

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P WANGDI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER
HON'BLE MR. SIDDHANTA DAS, EXPERT MEMBER

For Applicant(s): Mr. Sanjay Upadhyay and Mr. Salik Shafique,
Advocates
Mr. Raj Panjwani, Senior Advocate for I.A. No.
403/2019
Mr. Ankit Lodaya, Advocate for I.A. No. 08/2019

For Respondent(s): Mr. Daleep Dhyani, Advocate for UPPCB
Mr. Divya Prakash Pande, Advocate for CPCB and
MoEF&CC

ORDER

1. The issue for consideration is the absence of proper management of End-of-Life Tyres/Waste Tyres (ELTs) in accordance with the Environment (Protection) Act, 1986, Environment (Protection) Rules, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, CPCB Guidelines for Environmentally Sound Management of End of Life Vehicles, 2016 and Standard Operating Procedure (SOP) issued by the MoEF&CC.

it was observed that the reason of non-compliance is not meeting the criteria of SOP of MoEF & CC and the consent conditions issued by the SPCBs/PCCs. In case of non-compliances actions have been initiated in the form of closure directions or time specific directions for improvement or notices for compliance. The remedial measures suggested are as follows:

“Remedial Measures:

The following remedial measures are suggested for addressing the environmental concerns in the tyre pyrolysis units:

- 1) Only continuous tyre pyrolysis units be allowed and all the units having batch process be asked to switch over to continuous process within a given time frame of one year and till the time of conversion their operation be stopped;
- 2) The feed to the continuous reactors should be in the form of tyre chips and mechanical feeding system with air lock arrangements so that no air enters in the reactors.
- 3) The unit should install packed bed scrubber for control of gaseous emission and reduction of odour;
- 4) The tyre pyrolysis units should strictly follow the Standard Operating Procedures (SOPs) issued by MoEF& CC for continuous process and the consent conditions issued by SPCBs/PCCs.”

5. The report has also annexed Standard Operating Procedure (SOP) issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC) dated 24.11.2015 to the effect that ‘batch process’ leads to carbon spillage and exposure of workers. Some explosions have also been reported. Such process has major shortcomings. The recommendation is that the batch process should be switched over to ‘continuous process’ within one year. We are informed that that CPCB is going to issue a direction under Section 5 of the Environment (Protection) Act, 1986 directing switchover to ‘continuous process’ within one year.

6. Our attention has also been drawn to SOP on ‘import and recycling of waste pneumatic tyres’ to the effect that said tyres fall in Hazardous Waste Rules. Import thereof needs to be restricted to the actual users having requisite consent. It is also pointed out during the hearing that the State of Punjab issued order dated 15.11.2014 for the Location and Siting for Waste-tyre based Pyrolysis Plants and Pollution Prevention/Safety measures to be adopted by such units.

7. In view of above, it is clear that Pyrolysis process involves high level of pollution and also adversely affects

the health of the workers involved in the process. The matter being covered by the Hazardous Waste Management Rules, there is need for restrictions on import and to regulate location of such units in the light of the carrying capacity of the area.

8. Accordingly, CPCB may issue appropriate directions on the subject after due consideration of the issue. The directions should also deal with the restrictions on import so as to ensure that India does not become a dump yard for highly polluting hazardous waste material from other countries and also to ensure that health of the workers involved in the process is duly safeguarded.

9. The States wherein such 270 non-complying units are located need to take remedial action including levy of Environmental Compensation to ensure that such units comply with air, water and hazardous waste pollution norms within a reasonable time span. Let CPCB monitor the compliance and file the status and compliance report on or before 30.11.2019 by e-mail at judicial-ngt@gov.in.”

4. Accordingly, CPCB has filed status and compliance report on 18.12.2019 and additional supplementary status and compliance report on 03.01.2020. As per report dated 18.12.2019, information furnished by the 19 SPCBs and PCCs has been compiled which has been updated in the additional supplementary report dated 03.01.2020. The State wise status of compliance has been mentioned as follows:-

S. No.	States	Total number of units	Number of complying units	Non-complying units	Number of closed units	Remarks
1	Andhra Pradesh	39	06	15	18	The Board has issued closure order on 21.12.2019 to 15 number of non-complying Tyre pyrolysis units.
2.	Assam	08	05	0	03	-
3.	Bihar	18	0	2	18	All the 18 tyre pyrolysis units in the state are closed.
4.	Chhattisgarh	27	24	03	00	03 units disconnected

5. The statistics has been summed up as follows:-

“As per the action taken report as received from the SPCBs in compliance with the direction dated 04-12-2019, there are now 678 tyre pyrolysis units in 19 states of the country, an increase of 06 units over the last reported figure of 672. Out of 678 tyre pyrolysis units, 270 units are complying, 250 units are not complying and 155 units are closed/not in operation. CTO of 02 units are under renewal. Out of these two units one unit is operational and another unit is closed. 01 unit has applied for on line consent and the case is under process.

The increase in number of compliance units is mainly due to monitoring by CPCB and SPCBs. SPCBs based on direction of CPCB has started process of closing the non-compliance units. Maharashtra Pollution Control Board (MPCB) has recovered environmental compensation of Rs. 77,500/- from 3 units.”

6. Copies of directions issued by CPCB on 04.12.2019 and 30.12.2019 have been annexed which are as follows:-

04.12.2019

*“Now, THEREFORE, in exercise of the powers vested under the Section 5 of the Environment (Protection) Act, 1986, **directions are hereby issued to you to close down all such pyrolysis units in your State/UT which are not complying as on date with consent conditions and SOP of the MoEF&CC.** You are also directed to carry out strict vigilance and monitoring in complying industries to ensure continued compliance of consent conditions and SOP of MoEF&CC. You are further directed that import of polluting hazardous waste material shall be strictly regulated as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and amendment thereof.*

Action Taken Report (ATR) shall be submitted to the Central Pollution Control Board by 25.12.2019. Failing to comply with these directions, shall attract appropriate action under law.”

30.12.2019

“Now, THEREFORE, in exercise of the powers vested under the Section 5 of the Environment (Protection) Act, 1986, directions are hereby issued for regulating location of tyre pyrolysis industries in light of the carrying capacity of the area. Henceforth, any new/expansion of existing tyre pyrolysis industry be granted consent to establish or amendment in consent to establish only after assessing the carrying capacity of the area. You are also directed to ensure that health of workers involved in the tyre pyrolysis industries is safeguarded.

Action Taken Report (ATR) shall be submitted to the Central Pollution Control Board by 15.01.2020. Failing to comply with these directions, shall attract appropriate action under law.”

7. The CPCB has sought four months time to carry out further studies as follows:-

“In view of the representations from the All India Rubber & Tyre Recyclers Association, Mumbai (AIRTRA), where they have claimed that Advance Automated Plants addresses all the environmental concerns as raised by the CPCB and in view of the claim of Pyrolysis Industries Association, Punjab where they have claimed that existing batch plants are meeting the norms and SOPs, it has been decided that CPCB will carry out study of the advance batch automated plants as well as existing batch plants vis-a-vis continuous plant to ascertain whether existing would be able to meet environmental concerns or advance batch automated plants are required to address the environmental concerns. As per outcome of the study, further decision would be taken that whether existing batch/or advance batch automated plant is required or only continuous plants be allowed. CPCB has

planned to complete the said study within a period of four months starting from January 2020.”

8. Let the above study be carried out with the involvement of NEERI and IIT, Delhi. Compliance of directions already issued be overseen by the CPCB.

A further report in the matter be filed on or before 30.06.2020 by e-mail at judicial-ngt@gov.in. The report may also indicate the details of the environmental compensation assessed and recovered.

List for further consideration on 14.07.2020.

Adarsh Kumar Goel, CP

S.P Wangdi, JM

Dr. Nagin Nanda, EM

Siddhanta Das, EM

January 06, 2020
Original Application No. 400/2019
A



CENTRAL POLLUTION CONTROL BOARD
Regional Directorate (Chennai)

**STUDY ON BATCH PYROLYSIS PROCESS AT M/s. PAIRAN PYROLYSIS
PVT. LTD., SIPCOT, PERUNDURAI**

1.0 Background:

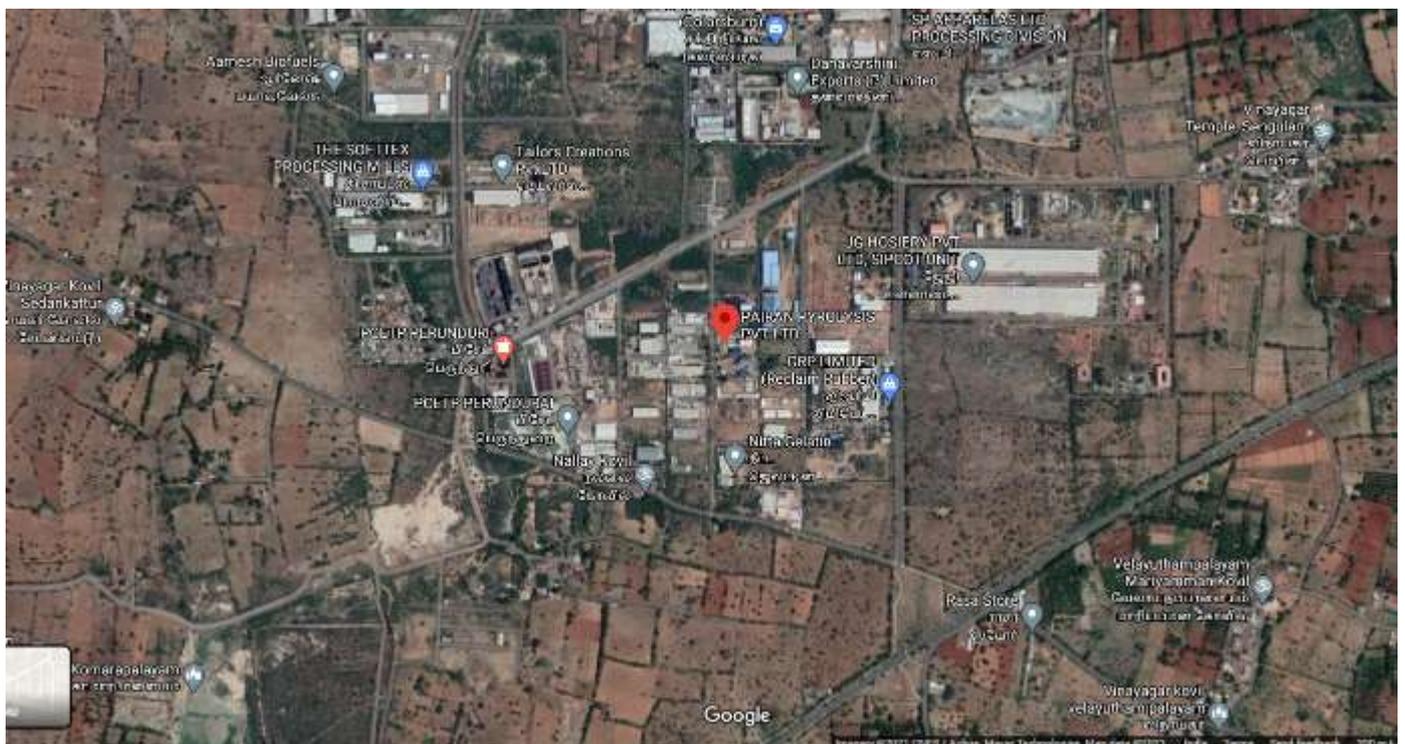
Central Pollution Control Board, Regional Directorate Chennai was directed to carry out the study at M/s Pairan Pyrolysis Pvt. Ltd., (Advanced Batch Process) with the following study protocol as suggested by the committee;

- *The monitoring will be carried out at both work place as well as ambient air quality with following parameters:*
 - *Work Place Monitoring: Respirable dust (PM₁₀, PM_{2.5}) (8 hr time weighted Avg), CO, VOCs, B□P.*
 - *Ambient Air Quality Monitoring: PM₁₀, PM_{2.5}, B□P, VOCs.*
- *In case of batch process monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of charcoal /fine carbon for comparison purpose.*
- *For ambient air quality, monitoring to be carried out for 8 hours during operation of the plant at two locations.*
- *Detailed analysis of tyre pyrolysis oil in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content (as per schedule V Part B of HoM rules 2016).*
- *Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analysed.*
- *Locations and numbers of sensors/alarms.*
- *Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire (draft questionnaire attached)*
- *Health assessment of workers through questionnaire (draft questionnaire attached).*
- *Any other parameter of interest if found to be useful during the study may also be included.*

Accordingly, monitoring was carried out during 06 – 07 January, 2021 and sampling was carried out through the NABL Accredited Lab M/s G Lens Innovation Labs Pvt. Ltd., Chennai.

2.0 About the industry:

M/s Pairan Pyrolysis Pvt. Ltd., is located in plot no. S-20, SIPCOT Industrial Complex, Ingur Village, Perundurai Taluk, Erode District. The nearby village Sengulam & Kuttapalayam village from the unit having aerial distance 1.25 KM & 603 m respectively.



The reactor capacity is 14 Tons of used tyre feeding per batch, whereas the unit is restricted to operate at 12 Tons capacity as per TNPCB consent. The consented quantity of production of various products are as follows;

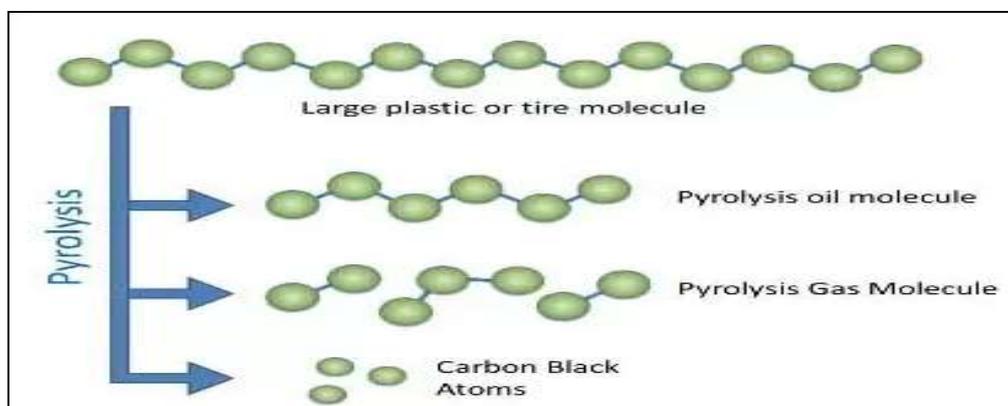
Sl. No	Description	Quantity	Unit
Product Details			
1	Fuel Oil	190	T/M
By- Product Details			
1	Carbon black	143	T/M
2	Steel Wire Scarp	58	T/M
Intermediate Product Details			
3	Gaseous Fuel	44	T/M

The consented quantity of trade effluent (scrubber bleed off) discharge through solar evaporation pond is 0.03 KLD.

The unit consists of batch pyrolysis reactor (horizontal circular air tight chamber of 2.6 m dia and 7.5 m length provided with internal spiral system), followed by Primary condenser 2 nos, Secondary condenser 4 nos., gas holding tank 1 no, Excess pyro gas firing chamber, scrubber and stack of 30 m height with flaring system.

3.0 Process Description:

Pyrolysis is a chemical reaction that involves molecular breakdown of larger molecules into smaller molecules in presence of heat. Pyrolysis is also known as thermal cracking, cracking, thermolysis, depolymerization, etc. Tyre pyrolysis is the process of converting waste tyres into products/intermediates like Pyrolysis Oil, Carbon Black, Steel Wire and Hydrocarbon Gas.



Typical Pyrolysis process

Scrap Tires are cut and are packed densely into the reactor chamber. The reactor is heated to 300 - 400 C through fuels. Initially pyrolysis oil emulsion is used for firing. After starting of process, the generated gas is condensed and oil is recovered. The uncondensed gas is further taken for firing, after cutoff of oil firing. The reactor is rotated slowly 0.5 – 2 RPM during the process. The condensed oil collected in the storage tanks connected to the individual condensers. After completion of process, the oil is taken to the final collection tank. The excess uncondensed gas is fired in a rectangular firing chamber. The exhaust from the firing chamber is connected to the scrubber followed by the stack. Flaring system is provided in the stack in case of firing the unburnt gas escape from the firing chamber.

After completion of the process, the reactor chamber is left for cooling until it reaches below 50°C. Then, the carbon is collected from the reactor by connecting the carbon chute tied with collection bag. Due to internal spiral arrangement, the carbon flows into the collection bag. To control the fugitive emission during the collection of carbon, suction hood with sprinkler is provided in the front of reactor. The suction hood is connected to the particulate collection bag.

Process timings for one batch process;

- Loading – 4 hours
- Process - 8 to 10 hours
- Cooling- 8 to 10 hours
- Carbon black and steel discharge (unloading) – 4 hours

4.0 Operation Status during inspection:

During the inspection, 10 Tons of waste cut tyres was fed to the reactor through Crane. The batch started at 11.30 AM (Day 1) and completed on Day 2 @ 4.00 PM, the total time of operation per batch 28.5 hrs. Time wise break of activities carried out is as follows;

- 11.30 AM – 01.30 PM - Waste Tyre loaded
- 2 PM – 10.40 PM - Process period
- Around 5.30 PM oil firing of reactor shifted to gas firing
- 11 PM – 12 noon – Cooling period
- 12 noon – After achieving the temperature below 50 C, unloading of carbon particles carried out till 4 PM

Temperature and pressure was noted through analog system, whereas during the operation the digital temperature & pressure sensor was not working. It was noticed that this digital system found working at initial operation & after cooling of condenser. The temperature & pressure values recorded manually is given in below table.

Time	Temperature C	Pressure Kg/cm3	Gas Tank Pressure Kg/cm3
02.50 PM	46	1 bar	-
03.10 PM	51.1	1 bar	-
03.30 PM	57.7	1 bar	-
03.50 PM	76.4	1 bar	-
04.10 PM	120.7	1 bar	-
04.30 PM	177.5	1 bar	-
04.50 PM	220	1 bar	-
05.10 PM	200	1 bar	-
05.30 PM	190	1 bar	-
05.50 PM	200	1 bar	-
06.10 PM	200	1 bar	-
06.30 PM	200	0.2	0.22
06.50 PM	200	0.2	0.22
07.00 PM	250	0.2	0.1
07.20 PM	270	0.23	0.2
07.40 PM	271	0.3	0.2
08.00 PM	280	0.2	0.15
08.20 PM	290	0.2	0.1
08.40 PM	281	0.2	0.2
09.00 PM	285	0.3	0.2
09.20 PM	295	0.2	0.2
09.40 PM	295	0.2	0.3
10.00 PM	290	0.2	0.2
10.20 PM	295	0.3	0.2
10.40 PM	300	0.3	0.2
11.00 PM	280	0.2	0.15
11.20 PM	270	0.29	0.21
11.40 PM	240	0.2	0.18
12.00 AM	210	0.15	0.09
12.30 AM	170	0.1	0.02
09.30 AM	110	-	-
12.00 noon	50	-	-

10 tons of tyre fed in the pyrolysis reactor, produces around 4200 lits of oil, approx. 3500 Kg (7 bags x 500 kg) of Carbon and approx.1.8 tons of steel.

After cooling, the external chute is connected to the carbon collection point and collection bag is tied in the chute. While opening the collection point carbon particle spillage is collected through bin. After fixing the reactor is rotated slowly, the internal spiral provided in the reactor

flows the carbon through the chute and collected in bag. During this process to control fugitive emission, the suction hood is operated and in the front two sides barrier is placed. Before opening the reactor nitrogen gas is purged.

6.0 Details of Monitoring & Analysis Report:

Based upon the batch process activity time, work place monitoring was carried out at time of loading, process, cooling & unloading and also VOC is monitored near condenser & storage tank.

Ambient Air Quality Monitoring was carried out at two locations in upward & downward wind directions for 24 hrs. The predominated wind direction is NE to SW, whereas the direction changes to SW to NE also. During the monitoring it was raining for 3.5 hrs between 02.30 AM to 06.00 AM. The sampling locations are shown in the below map.



The analysis result of ambient air quality monitoring results is given in the Table 1, 2 & 3. Toluene in the upwind found more comparatively to downwind direction. The value ranges from 12.73 $\mu\text{g}/\text{m}^3$ to 209.09 $\mu\text{g}/\text{m}^3$ and contribution is observed during night time & early

morning due to less dispersion. The contribution of toluene observed, since the station is placed near to the oil storage shed.

VOCs monitored in the work place are within the limit of OSHA PEL standard. The analysis result of work place monitoring is shown in the Table 4.

The PM10 concentration observed in the work place area during loading, process, cooling & unloading is 39.99, 30.11, 17.2 & 25.2 $\mu\text{g}/\text{m}^3$ respectively. The PM2.5 concentration observed in the work place area during loading, process, cooling & unloading is 17.31, 12.99, 8.33 & 16.3 $\mu\text{g}/\text{m}^3$ respectively. The PM concentration is observed slightly increases during loading & unloading as compared with the process & cooling time.

Table 1: Ambient Air Quality

SI.No	Parameters	Near Security Office (Downwind)	Near Steel Storage Yard (Upwind)	Standard
1	Particulate Matter (PM 10) - $\mu\text{g}/\text{m}^3$	56.4	55.5	100
2	Particulate Matter (PM 2.5)- $\mu\text{g}/\text{m}^3$	22.8	20.4	60
3	Carbon Monoxide as CO (1 hour) - mg/m^3	BDL (DL:1.14)	BDL (DL:1.14)	04
4	Benzo (a)Pyrene - ng/m^3	BLQ (LOQ:0.03)	BLQ (LOQ:0.03)	01

Table 2: VOCs in Ambient Air Monitoring (Upwind) ($\mu\text{g}/\text{m}^3$)

Sample Location	sample-1	sample-2	sample-3	24 Hrs Average
DICHLOROMETHANE	0.91	1.09	1.04	1.01
TOLUENE	12.73	94.36	209.09	105.40
BENZENE	0.00	0.00	0.00	0.00
m-XYLENE	10.61	6.40	0.56	5.86
o-XYLENE	10.62	6.34	0.42	5.79
ETHYLBENZENE	3.65	2.28	0.45	2.12
STYRENE	0.82	0.56	0.00	0.46
ISOPROPYLBENZENE	1.46	0.89	0.00	0.78
1,2,4-TRIMETHYLBENZENE	25.56	15.02	0.59	13.73
1,4-DICHLOROBENZENE	15.41	10.64	3.94	9.99
1,3,5-TRIMETHYLBENZENE	7.22	4.30	0.00	3.84
NAPHTHALENE	2.05	1.59	0.88	1.51

Table 3: VOCs in Ambient Air Monitoring (Downwind) ($\mu\text{g}/\text{m}^3$)

Sample Location	sample-1	sample-2	sample-3	24 Hrs Average
Dichloromethane	0.70	1.23	1.06	1.00
Toluene	13.34	20.15	15.24	16.24
Benzene	0.00	0.00	0.00	0
M-XYLENE	14.69	18.05	8.97	13.90
O-XYLENE	15.33	18.55	8.41	14.10
Ethylbenzene	4.52	7.61	5.39	5.84
Styrene	1.01	1.35	0.70	1.02
Isopropylbenzene	2.06	2.78	1.44	2.09
1,2,4-trimethylbenzene	44.31	48.01	16.70	36.34
1,4-dichlorobenzene	24.66	24.32	6.05	18.34
1,3,5-trimethylbenzene	13.30	14.70	5.10	11.03
Naphthalene	1.65	2.89	2.09	2.21

Table 4: Work Place Monitoring Results ($\mu\text{g}/\text{m}^3$)							$\mu\text{g}/\text{m}^3$	PPM	PPM
Sample Location	Front of reactor (Loading)	Front of reactor (process)	Front of reactor (cooling)	Front of reactor (Unloading)	Near condenser (process)	Near Storage tank (process)	Total		OSHA PEL (8 hrs)
Particulate Matter (PM 10)	39.99	30.11	17.2	25.2	-	-	-	-	-
Particulate Matter (PM 2.5)	17.31	12.99	8.33	16.3	-	-	-	-	-
Carbon Monoxide as CO	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	BDL (DL:1.14)	-	-	-
Benzo (a) Pyrene	-	BLQ (LOQ:0.03)	-	BLQ (LOQ:0.03)	-	-	-	-	-
Dichloromethane	5.18	0.71	0.77	2.58	1.24	1.72	12.2	0.0035	25
Toluene	494.75	15.99	21.12	77.13	19.73	334.04	962.76	0.2553	10
Benzene	2.41	0.00	0.00	0.00	0.00	1.86	4.27	0.0013	1
M-xylene	4.55	1.85	2.71	22.02	6.52	7.39	45.04	0.0103	100
O-xylene	3.12	1.38	2.19	10.92	3.22	3.19	24.02	0.0055	100
Ethylbenzene	4.46	1.05	1.99	11.54	2.78	6.66	28.48	0.0065	5
Styrene	2.10	0.00	0.88	3.76	1.77	1.86	10.37	0.0024	50
Isopropylbenzene	0.00	0.56	0.44	1.37	0.65	1.00	4.02	8.7x10⁻⁴	50
1,2,4-trimethylbenzene	3.76	4.33	6.93	7.96	18.34	2.33	43.65	0.0088	25
1,4-dichlorobenzene	25.27	3.01	9.31	8.36	63.08	70.48	179.51	0.0298	10
1,3,5-trimethylbenzene	0.00	1.36	1.92	2.98	4.10	0.96	11.32	0.0023	25
Naphthalene	6.63	1.10	1.23	3.97	22.88	1.11	36.92	0.007	0.1

The characteristics of the oil sample collected is shown in the below table 5. There is no specific standard prescribed for the oil derived from waste tyre. However, the same is compared with the specification of fuel derived from waste oil and all parameters are found within the specification.

Table 5: Oil Sample				
Sl.No	Parameters	unit	Pyrolysis Oil	Specification of fuel derived from waste oil
1	Sediment	%	0.18	0.25
2	Arsenic as As	PPM	BLQ (LOQ:1.0)	5
3	Cadmium as Cd + Chromium as Cr + Nickel as Ni	PPM	3.69	500
4	Lead as Pb	PPM	1.11	100
5	Poly aromatic Hydrocarbons	%	BLQ (LOQ:0.00025)	6
6	Polychlorinated Biphenyl	PPM	BLQ (LOQ:0.2)	< 2
7	Sulphur as S	%	0.0035%	4.5%
8	Total Halogens as Cl	mg/kg	BDL (DL:1.0)	4000
9	Water content	%	0.1	1%
10	Calorific Value	Kcal/kg	6347	

7.0 Steps taken by the unit for control of pollution:

- The unit has provided the suction hood and sprinkler system in the front of the reactor to control the fugitive emission during the operation of carbon unloading. The suction hood is connected to the bag to collect the particulate matter.
- It was informed by the unit that maximum cleaning of floors being carried out manually without using water.
- The emission from the reactor firing is connected to the scrubber followed by the common stack of height 32 m. The stack is provided with flaring system.
- The excess pyro gas is fired in the flaring chamber and connected to the scrubber followed by the common stack.
- The purge out water from the scrubbers is sent to solar evaporation pond.
- The unit has provided one methane sensors at firing chamber.

8.0 Outcome of Survey as per protocol:

- Survey of 10 persons from nearby village was carried out at Sengulam, Kutthampalayam, Kambuliyampatti & Varapalyam as per the provided questionnaire. In which six person said that odor issue was faced 2 years back and currently there is no issue due to operation of industry.
- Health assessment of workers also carried out through the questionnaire provided by the committee. As per the workers statement, they are not having any health issue.

Copy of the questionnaires are enclosed as Annexure 1 & II.

9.0 Steps required for improvement:

- Existing suction hood provided is not engineering designed, so same shall be modified accordingly to enhance appropriate suction.
- At present, the exhaust connected from suction hood is connected to collection bag, to improve efficacy of collection proper APCD shall be provided.
- The steel is removed using the crane and stored in the open storage yard, whereas carbon deposit in the steel leads to spillage during the dragging. The unit has a tray for collecting the steel to avoid spillage of deposited carbon particle, which was not used at time of inspection. The carbon deposit shall be removed mechanically or through water washing. So appropriate measures shall be taken for removal of carbon particles deposited on the steel to avoid spillage.
- Closed shed shall be provided for the storage of collected carbon and steel.

During the entire study, less particulate emission was observed. The unit has taken utmost care for control of particle emission. If such scenario is followed on day to day activity, the particulate emission during carbon unloading shall be controlled effectively.

As per scope/protocol of the work given by the committee, the unit is complying with pollution control norms and suggested to implement the above improvements said in point 9.

Improvement in the control of fugitive emission is observed after installation of APCDs. The comparison is made through google image & present photographs shown below;

Before (Google Image of March 2020)



After APCD Measures (At present)



The photograph & Videography's taken during the entire monitoring period is attached for reference.


(R. Rajkumar)
Scientist D

View of Plant



Loading



Excess Gas Flaring



Carbon Unloading





Suction Hood Exhaust connected to Bag





CENTRAL POLLUTION CONTROL BOARD Regional Directorate (Chennai)

Status of environmental issues in operation of tyres pyrolysis units at M/S. Pairan Pyrolysis Pvt. Ltd., Sipcot, Perundurai

Spillage of carbon in the working area:

After cooling, the external chute is connected to the carbon collection point and collection bag is tied in the chute. While opening the collection point carbon particle spillage is collected through bin. After fixing the chute, the reactor is rotated slowly, the internal spiral provided in the reactor flows the carbon through the chute and collected in bag. During this process to control fugitive emission, the suction hood is operated and in the front two sides barrier is placed.



The steel is removed using the crane and stored in the open storage yard, whereas carbon deposit in the steel leads to spillage during the dragging. The unit has a tray for collecting the steel to avoid spillage of deposited carbon particle, which was not used at time of inspection. The carbon deposit shall be removed mechanically or through water washing. So appropriate measures shall be taken for removal of carbon particles deposited on the steel to avoid spillage.



Exposure of workers to fine carbon particles;

Workers are provided proper Personnel Protective Equipment such as mask, gloves, boots.

Process emission due to escape of pyro gas which remains entrapped inside reactor vessel after completion of the process and their release into atmosphere with the opening of the main door of the reactor vessel;

Before opening the reactor nitrogen gas is purged into the reactor, due to forward feeding the gas is pushed off to the next chamber (condenser & gas holding tank) and VOC meter is used by the industry to check the presence of any gas in the reactor.



VOCs monitored in the work place are within the limit of OSHA PEL standard

Escape of pyro gas directly into atmosphere through emergency release valve due to increase of pressure in the reactor vessel;

During the inspection, it was observed that the pressure and temperature were being monitored and any increase in pressure, the gas is flared. No emergency situation noticed during this monitoring period.

In case of any abnormal emergency, pressure valve is provided to release the gas into atmosphere.

Release of excess pyro gas or uncondensed gases for flaring;

Excess pyro gas is fired in the flaring chamber and the unit has also provided addition flaring system in the stack at height of 32 mts.

Odor problem in plant and in neighborhood;

As per the provided questionnaire survey carried out in nearby villages, six person said that odor issue was faced 2 years back (public informed that odour issue was faced due to rubber reclaim industry situated in that industrial area behind M/s Pairan Pyrolysis Pvt. Ltd., and there

is no issue due to operation of this unit. Whereas during inspection slight odor was observed as like in petrol pumps.

Fugitive emission of charcoal/ fine carbon particle while removing from reactor vessel and its packing into the bags;

In front of the reactor, Suction hood is provided and two sides barrier is placed to control the fugitive emission.

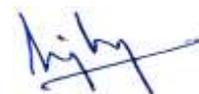
Purged water from the water seal (oil –water separator) provided to separate the water vapour from the pyro gas containing oil traces;

The unit has provided heavy duty macro emulsion fuel burner to fire oil with moisture (water) (in the ratio of 70% oil & 30% water condensate)

Spillage and floor washing containing charcoal particle and oil;

The unit has informed that mechanical/manual cleaning being carried out for removal of carbon particles. The bleed off scrubber water is sent to SEP.

The unit has provided closed loop system for oil, so that chances of oil spillage is reduced.



(R. Rajkumar)
Scientist D

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Sh. Senthil Kumar
2.	Age/ Gender	41/Male
3	Address /Contact number	S/o, Duraisamy 10/65 Sengulam, ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 ½ Years Back not Now.
6.	Specify if the person has any Health issue. Also mention duration	No Health Issue.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Not Applicable
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Sh. Tamilarasu
2.	Age/ Gender	22/Male
3	Address /Contact number	S/o Devaraj 10/65A, Sengulam, Ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years back Not Now.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Gobi
2.	Age/ Gender	24/Male
3	Address /Contact number	10/65 Sengulam, Ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Not Available.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



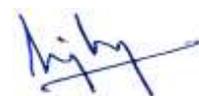
(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Smt. Sivagami Chinnan
2.	Age/ Gender	35/ Female
3	Address /Contact number	W/o Chinnan, 43,Arisana colony, Kutthampalayam, Ingur.
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Not Now. 2Years Back.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Boopathy Raja
2.	Age/ Gender	29/Male
3	Address /Contact number	S/o Palanisamy,Nagappagowndam Palayam, kampaliyampatti.
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years Back not now.
6.	Specify if the person has any Health issue. Also mention duration	No Health Issue
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Not Applicable
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Smt. Kanammal
2.	Age/ Gender	66/Female
3	Address /Contact number	122 sullimettur, kambuliyampatti
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years back not now.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil

(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Chennai Maran
2.	Age/ Gender	79/Male
3	Address /Contact number	s/o Maran, 31Arjuna colony kuttapalayam, Ingur
4.	Proximity of person from unit	1Km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	2 Years back not now.
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Smt. Vasantha mani
2.	Age/ Gender	65/Female
3	Address /Contact number	50, Utthandinayakkanputhur varapalyam, Kambiliyampatti
4.	Proximity of person from unit	3km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Nil
6.	Specify if the person has any Health issue. Also mention duration	Nil
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



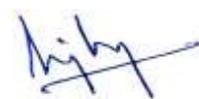
(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Valliyammal
2.	Age/ Gender	69/Female
3	Address /Contact number	17,Sedakattur,varapalyam.
4.	Proximity of person from unit	3km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Nil
6.	Specify if the person has any Health issue. Also mention duration	Winter Season time Cold Problem.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -1 (For persons in adjoining areas (within 1) km radius

No.	Head	Details
1.	Name	Sh. Rajendran
2.	Age/ Gender	58/Male
3	Address /Contact number	East Sanarpalayam varapalayam
4.	Proximity of person from unit	3km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Nil
6.	Specify if the person has any Health issue. Also mention duration	Winter Season time Cold and Sinus Problem.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	Nil
8.	Any feedback	Nil



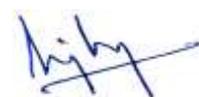
(R. Rajkumar)
Scientist D

Date: 06-01-2021

Place: Sengulam

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Lallbabu Mallick
2.	Age / Gender	31 / M
3.	Address /Contact Number	Gram –Purandarpur,Nabasta, Nanoor,Birbhum - 731215
4.	Designation	Operator
5.	Work profile	To operate the reactor during process (Hot) Time
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	Nil



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

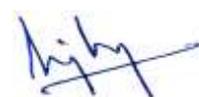
No.	Head	Details
1.	Name	Sh. Thakur Prasad Ram
2.	Age / Gender	55 / M
3.	Address /Contact Number	Shivmuni,Sarayakota,Saraikota,Kotwa, Narayanpur,Ballia,UP-277501
4.	Designation	Loader
5.	Work profile	To load & Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	Nil

(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Siddhnath
2.	Age / Gender	46 Years /M
3.	Address /Contact Number	S/o. Jay Govind, 291/18,Gahmar, Ghajipur,UP -232327
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	Nil

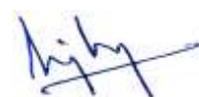


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Santhosh Kumar Yadav
2.	Age / Gender	34 / M
3.	Address /Contact Number	S/o.Mishri yadav,kudhaohwar,Ghazipur, Sammanpur,UP-233306
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Nil
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	

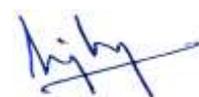


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Ramanivas Kumar
2.	Age / Gender	21 / M
3.	Address /Contact Number	S/o.Kalika Singh,Gajarahi,Buxar, Bihar -802122
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Nil
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	-

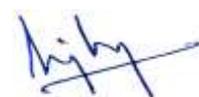


(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Gharbharan
2.	Age / Gender	39 / M
3.	Address /Contact Number	S/o.Durgavijay,Fakhruddinpur,Mubarakpur, Azmagarh,Sathion,UP-276406
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Good
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	-



(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sh. Prakash Banvasi
2.	Age / Gender	44 / M
3.	Address /Contact Number	S/o.Sechai Banvasi,Paliwar,Paliwar, Gazipur,Paliwar,UP-275204
4.	Designation	Loader
5.	Work profile	To load / Unload Raw material & Finished goods
6.	Working since how many years?	5 Years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hrs
9.	Health condition (Details)	Nil
10	In case of any health issues, specify duration of illness?	Not Applicable
11.	Any feedback	-

(R. Rajkumar)
Scientist D

Date: 06-01-2021
Place: Perundurai

RENEWAL OF CONSENT ORDER NO:2009231335391

DATE:25/02/2020

PROCEEDINGS NO.F.0292PND/RS/DEE/TNPCB/PND/A/2020 DATED: 25/02/2020

Sub :	Tamil Nadu Pollution Control Board – AUTO RENEWAL OF CONSENT –M/s. PAIRAN PYROLYSIS PRIVATE LIMITED , S.F. No. Plot No.S-20, Ingur Village, Perundurai Taluk, Erode District.211(Pt),212(Pt),242(Pt),243(Pt) & 244(Pt), INGUR village, Perundurai Taluk and Erode District- Renewal of Consent for operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) – Issued – Reg.
Ref :	i) CTO (Exp) Proc. No. F.0292PND/RS/DEE/TNPCB/PND/A/2016, dt. 01.02.2016 ii) RCO Proc. No. F.0292PND/RS/DEE/TNPCB/PND/A/2018, dt. 20.02.2018 iii) CTO (Direct) Proc. No. F.0292PND/RS/DEE/TNPCB/PND/A/2018, dt. 16/08/2018 iv) Unit's Application for Auto Renewal of Consent through OCMMS vide Application No. 31335391, dt. 10.02.2020. v) Minutes of the 163rd DLCCC Meeting held on 24.02.2020 (Item No. 163-05)

Renewal of Consent is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) (hereinafter referred to as “The Act”) and the rules and orders made there under to

The Director,
M/s . PAIRAN PYROLYSIS PRIVATE LIMITED
S.F No. Plot No.S-20, Ingur Village, Perundurai Taluk, Erode District.211(Pt),212(Pt),242(Pt),243(Pt) & 244(Pt),
INGUR Village,
Perundurai Taluk,
Erode District.

Authorizing the occupier to operate the industrial plant in the Air Pollution Control Area as notified by the Government and to make discharge of emission from the stacks/chimneys.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This RENEWAL OF CONSENT is valid for the period ending - March 31, 2021

M. Saravanakumar Digitally signed by M. Saravanakumar
Date: 2020.02.26 15:47:42 +05'30'
**District Environmental Engineer,
Tamil Nadu Pollution Control Board,
PERUNDURAI**

SPECIAL CONDITIONS

1. This renewal of consent is valid for operating the facility for the manufacture of products (Col. 2) at the rate (Col. 3) mentioned below. Any change in the products and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl.No.	Description	Quantity	Unit
Product Details :-			
1.	fuel oil	190	Ton/month
By-Product Details :-			
1.	carbon black	143	Ton/month
2.	Steel scrap	58	Ton/month
Intermediate Product Details :-			
1.	Gaseous fuel	44	Ton/month

2. This renewal of consent is valid for operating the facility with the below mentioned emission/noise sources along with the control measures and/or stack. Any change in the emission source/control measures/change in stack height has to be brought to the notice of the Board and fresh consent/Amendment has to be obtained

I				
Point source emission with stack :				
Stack No	Point Emission sources	Air pollution Control measures provided	Stack height from Ground Level in m	Gaseous Discharge in Nm ³ /hr
1	REACTOR FURNACE 14T & CLOSED ODOR CONTROL FURNACE	2 INDIVIDUAL WET SCRUBBERS CONNECTED TO COMMON STACK	30	
2	Dg set 62.5 kva	Stack	4	
II				
Fugitive/Noise emission :				
Sl.No.	Fugitive or Noise Emission sources	Type of Emission	Control measures provided	Quantity
1.	DG Set 62.50 KVA	Noise	Acoustic enclosures with stack provided	

Additional Conditions-

- The unit shall not reinstate and operate the Reactor furnace (12 T) after the repairing work without obtaining prior consent of the Board.
- The unit shall comply with the Standard Operating Procedure issued by the MoEF, Govt. of India with respect to the recycling of Waste Tyre Scrap for the production of Pyrolysis oil.
- The unit shall comply with the directions and orders issued by the Hon'ble NGT, Principal Bench in O.A. No. 400/2019 from time to time.
- The unit shall comply with the directions issued by the CPCB for tyre pyrolysis units from time to time.
- The unit shall operate the Air Pollution Control Measures connected to the reactor furnaces efficiently and continuously so as to achieve the AAQ / stack emission standards prescribed by the Board.
- The unit shall ensure that no odour is generated from the unit premises at any point of time. The unit shall take additional precautionary measures in controlling odour nuisance.
- The unit shall operate and maintain the Flaring arrangement provided efficiently and continuously so as to control the odour nuisance.
- The unit shall follow all the safety measures to be adopted in the Pyrolysis process in order to avert any untoward incident.

9. The unit shall ensure that all the workers and labours to wear Personal Protective equipments and to follow all the safety measures to be adopted during operation of the plant.

10. The unit shall obtain necessary valid license / permission from the Fire Department, Health Department, Directorate of Industrial Safety and Health and any other competent Authority

11. The unit's operation shall not attract any public complaint.

12. The unit shall continue to develop the green belt within the premises.

13. The unit shall not use 'use and throwaway plastics' such as plastic sheets used for food wrapping, spreading on dining table, etc., plastic plates, plastic coated tea cups, plastic tumbler, water pouches and packets, plastic straw, plastic carry bag and plastic flags irrespective of its thickness within the industry premises. Instead, the unit shall encourage use of eco friendly alternative such as banana leaf, arecanut palm plate, stainless steel, glass, porcelain plates / cups, cloth bag, jute bag, etc.,

M. Saravanakumar Digitally signed by M. Saravanakumar
Date: 2020.02.26 15:48:02 +05'30'
**District Environmental Engineer,
Tamil Nadu Pollution Control Board,
PERUNDURAI**

To

The Director,
M/s.PAIRAN PYROLYSIS PRIVATE LIMITED,
8A, 4th Street, Kathir Layout,
Kangeyam Road,
Tirupur.,
Pin: 641604

Copy to:

- 1.The Commissioner, CHENNIMALAI-Panchayat Union, Perundurai Taluk, Erode District .
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Salem for favour of kind information.
4. File

This is computer generated, Signature is not required.

RENEWAL OF CONSENT ORDER NO:2009131335391

DATE:25/02/2020

PROCEEDINGS NO.F.0292PND/RS/DEE/TNPCB/PND/W/2020 DATED: 25/02/2020

Sub :	Tamil Nadu Pollution Control Board – AUTO RENEWAL OF CONSENT – M/s. PAIRAN PYROLYSIS PRIVATE LIMITED S.F No. Plot No.S-20, Ingur Village, Perundurai Taluk, Erode District.211(Pt),212(Pt),242(Pt),243(Pt) & 244(Pt), INGUR Village, Perundurai Taluk, Erode District- Renewal of Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.
Ref :	i) CTO (Exp) Proc. No. F.0292PND/RS/DEE/TNPCB/PND/W/2016, dt. 01.02.2016 ii) RCO Proc. No. F.0292PND/RS/DEE/TNPCB/PND/W/2018, dt. 20.02.2018 iii) CTO (Direct) Proc. No. F.0292PND/RS/DEE/TNPCB/PND/W/2018, dt. 16/08/2018 iv) Unit's Application for Auto Renewal of Consent through OCMMS vide Application No. 31335391, dt. 10.02.2020. v) Minutes of the 163rd DLCCC Meeting held on 24.02.2020 (Item No. 163-05)

Renewal Of Consent is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The Director,
M/s . PAIRAN PYROLYSIS PRIVATE LIMITED
S.F No. Plot No.S-20, Ingur Village, Perundurai Taluk, Erode District.211(Pt),212(Pt),242(Pt),243(Pt) & 244(Pt),
INGUR Village,
Perundurai Taluk,
Erode District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This RENEWAL OF CONSENT is valid for the period ending - March 31, 2021

M. Saravanakumar Digitally signed by M. Saravanakumar
Date: 2020.02.26 15:48:20 +05'30'
**District Environmental Engineer,
Tamil Nadu Pollution Control Board,
PERUNDURAI**

SPECIAL CONDITIONS

1. This renewal of consent is valid for operating the facility for the manufacture of products (Col. 2) at the rate (Col. 3) mentioned below. Any change in the products and its quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Sl.No.	Description	Quantity	Unit
a.	Product Details :-		
1.	fuel oil	190	Ton/month
b.	By-Product Details :-		
1.	carbon black	143	Ton/month
2.	Steel scrap	58	Ton/month
c.	Intermediate Product Details :-		
1.	Gaseous fuel	44	Ton/month

- 2 This renewal of consent is valid for operating the facility with the below mentioned permitted outlets for the discharge of sewage/trade effluent. Any change in the outlets and the quantity has to be brought to the notice of the Board and fresh consent has to be obtained.

Outlet No.	Description of Outlet	Maximum daily discharge in KLD	Point of disposal
EFFLUENT TYPE :- Effluent Type : Sewage			
1.	Sewage 1	2.0	On Industrys own land
EFFLUENT TYPE :- Effluent Type : Trade Effluent			
OUTLET NUMBER	DESCRIPTION OF OUTLET	MAXIMUM DAILY DISCHARGE (IN KLD)	POINT OF DISPOSAL
1.	Trade Effluent 1	0.03	Solar Evaporation Pans

Additional Conditions-

1. The unit shall not reinstate and operate the Reactor furnace (12 T) after the repairing work without obtaining prior consent of the Board.
2. The unit shall comply with the Standard Operating Procedure issued by the MoEF, Govt. of India with respect to the recycling of Waste Tyre Scrap for the production of Pyrolysis oil.
3. The unit shall comply with the directions and orders issued by the Hon'ble NGT, Principal Bench in O.A. No. 400/2019 from time to time.
4. The unit shall comply with the directions issued by the CPCB for tyre pyrolysis units from time to time.
5. The unit shall continue to dispose Sewage through Septic tank and Dispersion trench arrangement.
6. The unit shall dispose the wet scrubber bleed off in solar evaporation pans.
7. The unit shall ensure that no trade effluent other than scrubber bleed off is generated from the process at any point of time.
8. The unit shall properly remove carbon black, the by product from the reactor and shall be kept in closed shed before sent out from the premises.
9. The unit shall properly burn the reactor non-condensable hydrocarbon gas in the reactor as reported.
10. The unit shall dispose the Non-hazardous solid wastes then and there without accumulation of the same within the premises.
11. The unit shall comply with the provisions of Hazardous and Other Wastes (M & TM) Rules, 2016.

12. The unit shall follow all the safety measures to be adopted in the Pyrolysis process in order to avert any untoward incident.
13. The unit shall ensure that all the workers and labours wear the Personal Protective equipments and to follow all the safety measures to be adopted during operation of the plant.
14. The unit shall obtain necessary valid license / permission from the Fire Department, Health Department, Directorate of Industrial Safety and Health and any other competent Authority
15. The unit's operation shall not attract any public complaint.
16. The unit's activity shall not attract any public complaint.
17. The unit shall not use 'use and throwaway plastics' such as plastic sheets used for food wrapping, spreading on dining table, etc., plastic plates, plastic coated tea cups, plastic tumbler, water pouches and packets, plastic straw, plastic carry bag and plastic flags irrespective of its thickness within the industry premises. Instead, the unit shall encourage use of eco friendly alternative such as banana leaf, arecanut palm plate, stainless steel, glass, porcelain plates / cups, cloth bag, jute bag, etc.,

M. Saravanakumar Digitally signed by M. Saravanakumar
Date: 2020.02.26 15:48:34 +05'30'
**District Environmental Engineer,
Tamil Nadu Pollution Control Board,
PERUNDURAI**

To
The Director,
M/s.PAIRAN PYROLYSIS PRIVATE LIMITED,
8A, 4th Street, Kathir Layout,
Kangeyam Road,
Tirupur.,
Pin: 641604

Copy to:

- 1.The Commissioner, CHENNIMALAI-Panchayat Union, Perundurai Taluk, Erode District .
2. Copy submitted to the Member Secretary, Tamil Nadu Pollution Control Board, Chennai for favour of kind information.
3. Copy submitted to the JCEE-Monitoring, Tamil Nadu Pollution Control Board, Salem for favour of kind information.
4. File

This is computer generated, Signature is not required.

AUTHORISATION No. 20HRC31375854 dated 08/06/2020

Proceeding No. T1/TNPCB/F.0292PND/HWA/RS/PND/2020 dated 08/06/2020

Sub: Tamil Nadu Pollution Control Board – Hazardous Waste Authorization-Renewal- M/s. PAIRAN PYROLYSIS PRIVATE LIMITED, S.F.No. Plot No.S-20, Ingur Village, Perundurai Taluk, Erode District.211(Pt),212(Pt),242(Pt),243(Pt) & 244(Pt), INGUR Village, PERUNDURAI Taluk, Erode District - Authorization under Rule 6 (2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 enacted under Environment (Protection) Act, 1986 – Issued-Reg.

Ref: 1. Unit's application No. 31375854 dated 20.02.2020
2. HWA-IR.No.0292PND/HWA/RS/DEE/PND/2020 dated 16/03/2020

FORM 2

[See rule 6 (2)]

FORM FOR GRANT OR RENEWAL OF AUTHORISATION TO THE OCCUPIERS, RECYCLERS, REPROCESSORS, REUSERS, USER AND OPERATORS OF DISPOSAL FACILITIES

1. Number of authorization: 20HRC31375854 and dated : 08/06/2020
2. The Director of M/s. PAIRAN PYROLYSIS PRIVATE LIMITED is hereby granted an Authorisation based on the enclosed signed Inspection report for Collection, Reception, Transportation, Storage, Recovery and Reuse of hazardous or other wastes or both on the premises situated at S.F.No. Plot No.S-20, Ingur Village, Perundurai Taluk, Erode District.211(Pt),212(Pt),242(Pt),243(Pt) & 244(Pt), INGUR Village, PERUNDURAI Taluk, Erode District.

Sl No	Schedule / Name of the Processes	Name of Hazardous Waste (with category No)	Quantity	Activities for which Authorization is issued
1	Schedule III /Part-B- B3- Wastes containing principally organic constituents, which may contain metals and inorganic materials	B3140-Waste pneumatic and other tyres, excluding those which do not lead to resource recovery, recycling, reclamation but not for direct reuse	5220 T/Annum	Collection,Transportation, Reception, Storage, Recovery and Reuse - Captive

3. This authorization shall be valid for a period upto 07/06/2025.

The Authorization is issued subject to the following general and special conditions annexed.

G. Gopalakrishnan

Digitally signed by G. Gopalakrishnan
DN: c=IN, o=Tamilnadu Pollution Control Board, ou=Engineering Department,
postalCode=600002, st=Tamil Nadu,
2.5.4.20<547e0e335bb27e470bca345ea344c02609a20d871b23330276639d76e16a,
serialNumber=34856e839e18279e0c0b0e0e9ca23d3e35a80e1691cc27958b3f0d715d517,
cn=G. Gopalakrishnan
Date: 2020.06.09 07:18:13 +05'30'

**For Member Secretary
Tamil Nadu Pollution Control Board
Chennai**

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 authorization or its renewal shall be produced for inspection at the request of an officer authorized by Tamil Nadu Pollution Control Board.
3. The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous and other wastes except what is permitted through this Authorisation.
4. Any unauthorized change in personnel, equipment or working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.

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 CPCB guidelines on “Implementing Liabilities for Environmental damages due to Handling and Disposal of Hazardous Wastes and Penalty”.
7. It is the duty of the authorized person to take prior permission of Tamil Nadu Pollution Control Board to close down the facility.
8. The imported Hazardous and other wastes shall be fully insured for transit as well as the accidental occurrences 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 wastes 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 or mitigation of damages if any.
12. An application for the renewal of an authorization shall be made as laid down under these Rules.
13. Any other conditions for compliance as per the Guidelines issued by the MoEF and CC or CPCB from time to time.
14. Annual returns shall be filed by June 30th for the period ending 31st March of the previous financial year.

D. SPECIFIC CONDITIONS - Actual Users (Recyclers/Pre-processors/Co-processors)

1. The actual user shall be responsible for safe and environmentally sound management of hazardous and other wastes
2. The actual user shall procure and process the hazardous and other wastes for reuse, recycle, pre-process, utilise including co-processing for beneficial purposes only.
3. The utilisation of hazardous and other wastes as a resource or after pre-processing either for co-processing or for any other use, including within the premises of the generator (if it is not part of process), shall be carried out only after obtaining authorisation from TNPCB in respect of waste on the basis of standard operating procedures or guidelines provided by the Central Pollution Control Board.
4. The authorised actual user of hazardous and other wastes shall maintain records of hazardous and other wastes purchased in a passbook issued by the State Pollution Control Board along with the authorisation
5. Handing over of the hazardous and other wastes to the authorised actual user shall be only after making the entry into the passbook of the actual user
6. The actual user handling hazardous and other wastes shall file an annual return in Form 4 to TNPCB on or before the 30th day of June following the financial year to which that return relates.
7. The actual user or the transporter shall immediately intimate TNPCB through telephone, e-mail about the accident and subsequently send a report in Form 11, where an accident occurs at the facility of the occupier handling hazardous or other wastes and operator of the disposal facility or during transportation
8. The actual user, importer or exporter shall be liable for all damages caused to the environment or third party due to improper handling and management of the hazardous and other wastes.
9. The actual user shall not be permitted to import hazardous and other wastes from any country to India for disposal.
10. The actual user shall not be permitted to import hazardous and other wastes specified in Schedule VI of the rules.
11. The actual user shall import hazardous and other wastes from any country only for recycling, recovery, reuse and utilisation including co-processing.
12. The actual user shall import the hazardous waste as in Part A of Schedule III after obtaining prior informed consent of the exporting country and the permission of the Ministry of Environment, Forest and Climate Change
13. The actual user shall maintain records of the hazardous and other waste imported by him in Form 3 and the record so maintained shall be made available for inspection.

ADDITIONAL SPECIFIC CONDITIONS

1. The unit shall recycle the Hazardous Wastes B3140-Waste pneumatic and other tyres, excluding those which do not lead to resource recovery, recycling, reclamation but not for direct reuse - 5220 T/Annum as reported.
2. No municipal solid waste or bio-medical waste or hazardous waste or any other type of contaminants shall be allowed to be imported along with the Waste pneumatic and other tyres.
3. The unit shall submit the annual return on the import of waste tyres as approved by the concerned authorities, i.e., customs authorities.
4. The unit shall restrict the import of waste tyres so as to manufacture within the consented production quantity.
5. The unit shall store the raw materials in the closed shed and shall maintain the fire hydrants/extinguishers in operating condition at all times.
6. The unit shall comply with the provisions under schedule III, Part B of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 for import of B3140 - Waste pneumatic and other tyres, excluding those which do not lead to resource recovery, recycling, reclamation but not for direct reuse.
7. The unit shall ensure that all the provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 are complied with while handling the waste.
8. The unit shall procure the Hazardous wastes for recycling from Domestic sources only as reported. If unit intend to import the hazardous wastes for recycling then the unit shall obtain necessary permission from the Ministry of Environment, Forest and Climate Change and the license from Directorate General of Foreign Trade.
9. The unit shall ensure that there is no spillage in the storage area.
10. The unit shall provide the display board specifying the quantity of hazardous waste accumulated and disposed in the storage area.
11. The unit shall maintain records of hazardous and other wastes in FORM III of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
12. The unit shall furnish the annual returns in FORM IV of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 to the TNPCB on or before thirtieth June of every year.
13. The unit shall send the Transport Emergency (TREM) card (Form 9) with the transporter during the transportation of hazardous wastes.
14. The unit shall ensure that the transport container shall be marked and labelled as prescribed in Form-8 of the hazardous wastes rules.
15. The unit shall ensure that there shall be no leakage or spillages of hazardous waste from the container during transportation of waste
16. The unit shall follow up the procedures in respect of hazardous waste manifest in Rule 19 (1).

G. Gopalakrishnan

Digitally signed by G. Gopalakrishnan
DN: cn=G. Gopalakrishnan, o=Tamil Nadu Pollution Control Board, ou=Engineering Department,
postalCode=600032, st=Tamil Nadu,
c=IN, email=gopalakrishnan@tnpcb.org, serialNumber=3465e6839d182796c00b0b69ca23d3e35a80e1b91cc2790fb36c0d715d517,
cn=G. Gopalakrishnan
Date: 2020.06.09 07:18:47 +0530'

**For Member Secretary
Tamil Nadu Pollution Control Board
Chennai**

To

The Director

PAIRAN PYROLYSIS PRIVATE LIMITED

8A, 4th Street, Kathir Layout,

Kangeyam Road,

Tirupur.

Pin:641604

Copy to:

1. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Salem.
2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, PERUNDURAI.

PASSBOOK FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES
PURCHASED BY THE ACTUAL USERS
(ISSUED ALONGWITH AUTHORISATION)

Name and address of the Industry-Actual users	PAIRAN PYROLYSIS PRIVATE LIMITED 8A, 4th Street, Kathir Layout, Kangeyam Road, Tirupur.		
OCMMS File No	0292PND/HWA		
Mobile No	9677778017		
E-mail Id	ezhil@pairangroup.com		
Passbook Registration No	PB/20HRC31375854		
Date of issue	08/06/2020		
Validity period	08/06/2020 To 07/06/2025		
Type and quantity of the Hazardous & Other Wastes permitted for procurement and recycling:			
SI No	Hazardous & Other Wastes Type	Passbook Type	Quantity with unit
1	Other Wastes	MANUAL/ FORM 4 ANNUAL RETURNS SUBMITTED	5220 T/Annum

G. Gopalakrishnan

Digitally signed by G. Gopalakrishnan
 DN: c=IN, ou=Tamilnadu Pollution Control Board, ou=Engineering Department,
 postalCode=600032, st=Tamil Nadu,
 2.5.4.20=c5471c0d331e0b074678bca345ead344c2260920a871b233027b639d76416a,
 serialNumber=3486ae839d18279e6c00b0bb69ca23d3e35a80e1b91cc279b6b3fcd0715d517,
 cn=G. Gopalakrishnan
 Date: 2020.06.09 07:19:12 +05'30'

For Member Secretary
Tamil Nadu Pollution Control Board
Chennai

PASSBOOK FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES
PURCHASED BY THE ACTUAL USERS

Sl No	Date	Name and Type of the Waste	Total Quantity received (MT)	Received from (in case of import, details of bill entry)	Date of arrival at the unit's premises with seal and signature of designated officer of the unit

PASSBOOK FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES
PURCHASED BY THE ACTUAL USERS

Sl No	Date	Name and Type of the Waste	Total Quantity received (MT)	Received from (in case of import, details of bill entry)	Date of arrival at the unit's premises with seal and signature of designated officer of the unit

PASSBOOK FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES
PURCHASED BY THE ACTUAL USERS

Sl No	Date	Name and Type of the Waste	Total Quantity received (MT)	Received from (in case of import, details of bill entry)	Date of arrival at the unit's premises with seal and signature of designated officer of the unit

PASSBOOK FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES
PURCHASED BY THE ACTUAL USERS

Sl No	Date	Name and Type of the Waste	Total Quantity received (MT)	Received from (in case of import, details of bill entry)	Date of arrival at the unit's premises with seal and signature of designated officer of the unit

STUDY REPORT ON THE BATCH PYROLYSIS PROCESS AT M/S. EXCEL INDUSTRIES (UNIT 2), HATKANANGALE, KOLHAPUR.

1. Background:

Central Pollution Control Board, Regional Directorate, Pune, was directed to carry out the study at M/s Excel Industries (Unit-2), Phase-1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, Kolhapur (Maharashtra) with the following study protocol;

- ❖ The monitoring will be carried out at both work place as well as in ambient environment for air quality with following parameters:
 - Work Place Monitoring (08 hourly): Respirable dust (PM₁₀, PM_{2.5}) CO, VOCs, Benzo(a)pyrene.
 - Ambient Air Quality Monitoring (24 hourly): PM₁₀, PM_{2.5}, VOCs, Benzo(a)pyrene.
- ❖ In case of batch process, monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of charcoal / fine carbon for comparison purpose.
- ❖ For ambient air quality, monitoring to be carried out for 8 hours during operation of the plant at two locations.
- ❖ Detailed analysis of tyre pyrolysis oil in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium + chromium + nickel, PAH, Total halogens, PCBs and water content (as per schedule V part B of HoM rules 2016).
- ❖ Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analyzed.
- ❖ Locations and numbers of sensors / alarms.
- ❖ Survey of minimum 10 persons in the adjoining areas (within 1 km radius) through questionnaire (draft questionnaire attached)
- ❖ Health assessment of workers through questionnaire (draft questionnaire attached)
- ❖ Any other parameter of interest if found to be useful during the study may also be included.

Accordingly, monitoring was carried out during 07 – 08 February, 2021 at the aforesaid M/s Excel Industries (Unit-2), Hatkanangale, Kolhapur, and sampling was carried out through a laboratory- M/s Bureau Veritas India Pvt. Limited recognized under the Environment (Protection) Act, 1986. Mr. F. Santhosh Benedict represented as team leader from the laboratory side during the sampling. The following officials participated during the same:

- (i) Shri Bharat K Sharma, Regional Director, Central Pollution Control Board, Regional Directorate Pune, and;
- (ii) Dr. K V George, Scientist & Head - APC Division, National Environmental Engineering Research Institute, Nagpur

The Regional Officer and other officials from the Kolhapur Regional Office, Maharashtra Pollution Control Board, also participated during the studies. Shri. Sameer Wathare (Plant owner), Mr. Ram Bahadur Ram (Plant Operator) and other representatives of the plant operator were also present during the studies.

2. About the Industry:

M/s Excel Industries (Unit-2) is located at Phase -1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, District Kolhapur (Maharashtra). Google Map showing location of the plant is given in Fig. 1.

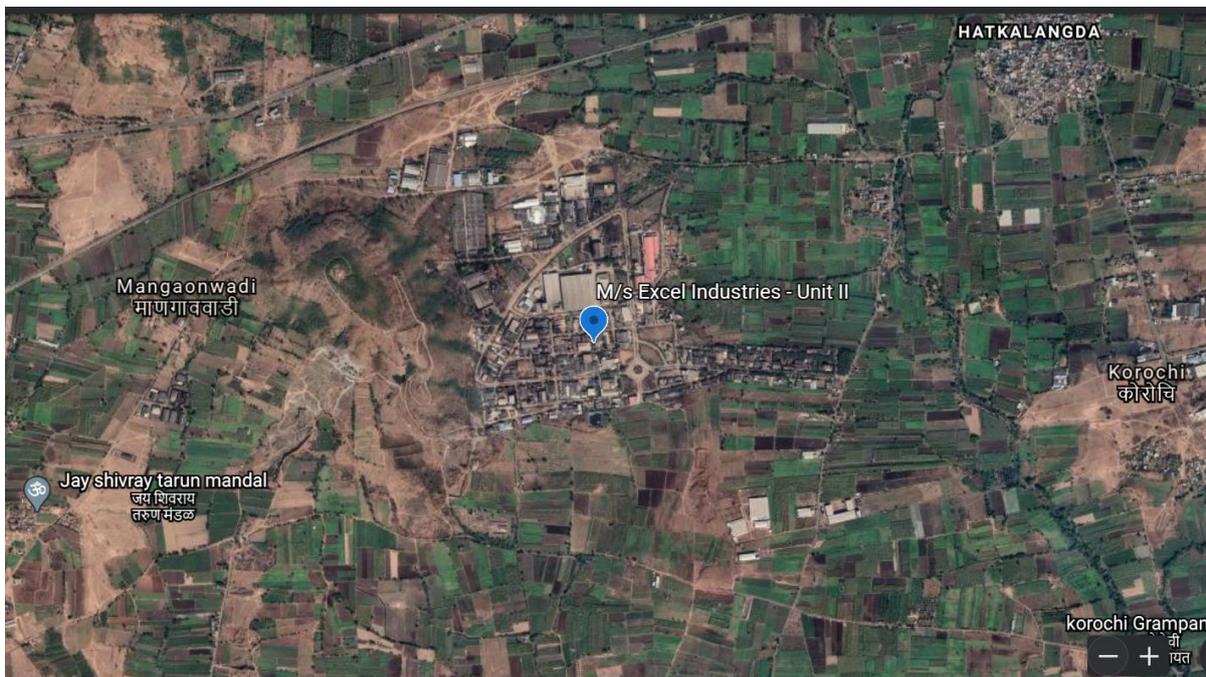


Fig. 1: Google Map showing location of M/s Excel Industries (Unit-2) in Phase -1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, District Kolhapur

The unit is engaged in Tyre Waste pyrolysis and has been granted Consent to Operate under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 by Maharashtra Pollution Control Board (MPCB) vide letter dated 13/9/2019 having validity till 13/9/2019. The unit started operation of its plant on 16/9/2019. The unit was directed by MPCB vide letter dated 21/12/2019 to close down the production activity forthwith till the time of conversion from batch

process to continuous tyre pyrolysis activity. MPCB, however, revoked the said direction of production closure vide letter dated 01/2/2021 and also renewed the Consent to Operate till 31/8/2023 vide letter dated 01/2/2021. Copy of the said Consent to Operate dated 13/9/2019; closure direction dated 21/12/2019; revocation order dated 01/2/2021 of closure direction, and renewed Consent to Operate dated 01/2/2021 are given at Annexure I, II, III and IV respectively.

The unit has been granted Consent to Operate for manufacturing of the following:

Table 1: Product and Quantity as per the Consent to Operate

Sr. No.	Product Name	Maximum Quantity	Unit
1.	Rubber Pyrolysis Oil	3800	Kg/D
Byproducts			
2.	Carbon Black Powder	3500	Kg/D
3.	Steel Wire	1500	Kg/D

The consented daily quantity of sewage effluent from the industry is 1 m³.

3. Process description and Plant & Machineries:

Pyrolysis is a chemical reaction that involves molecular breakdown of larger molecules into smaller molecules in presence of heat but in absence of air. Pyrolysis is also known as thermal cracking, cracking, thermolysis, depolymerization, etc. Tyre pyrolysis is the process of converting waste tyres into products / intermediates like pyrolysis oil, carbon black, steel scrap and hydrocarbon gas.

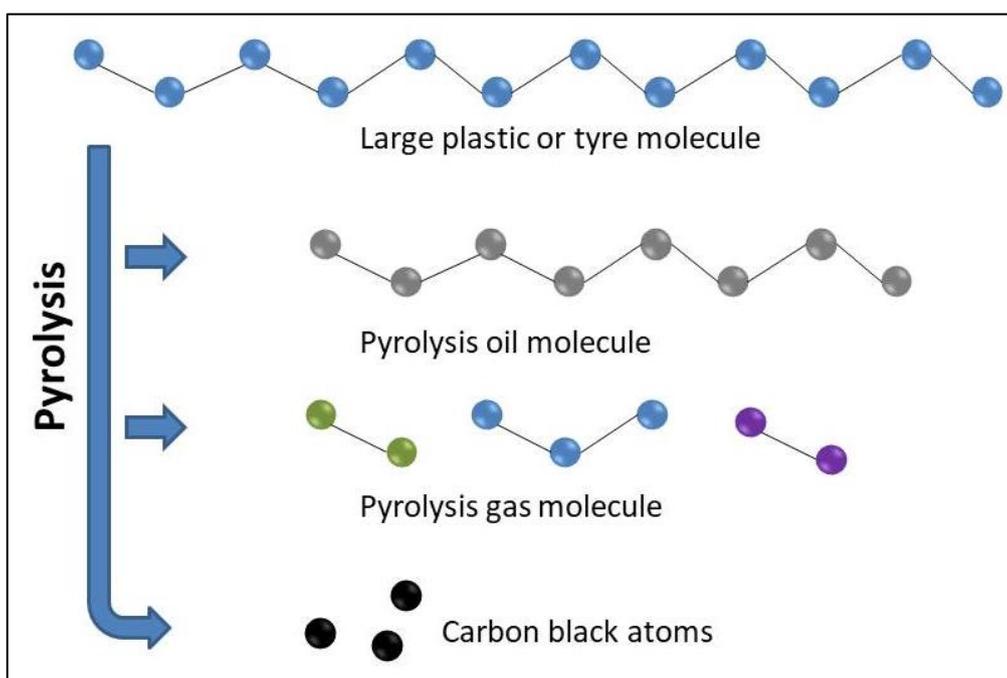


Fig. 2: Typical Pyrolysis Process

Scrap tyres i.e Tyre Wastes collected at the stockyard are segregated and cut into pieces (if not procured in cut pieces) in open within the plant premises. It was informed that waste tyres of four wheelers or bigger tyres (usually not two wheeler tyres) are cut into pieces using cutter machine, if required. These tyre wastes (containing steel within) from stockyard are loaded into the Tyre Pyrolysis Reactor using Telescopic Handler Tractor. The Tyre Pyrolysis Reactor is rotary horizontal cylinder of diameter 2600 mm and length 7500 mm mounted on ground and has provision of heating outer jacket of the cylinder using burners (02 gas fired and 03 oil fired burners) at the bottom. Top of outer jacket of the Reactor is connected to the stack through ducting, Wet Scrubber, ID Fan and stack of height of about 30 m from the ground.

Back of the Tyre Pyrolysis Reactor is connected to the Primary Tank, where some of the gases are condensed and deposited along with some Carbon which are transferred to the oil collection tank. The uncondensed gases are, thereafter, passed into the Pass Condenser, followed by Water Pass Tank for further condensation. From Water Pass Tank, the gases enter into 03 Horizontal Condensers. Water from Cooling Tower is passed through Pass Condenser, Water Pass Tank and the Horizontal Condensers and the oil thus produced on condensation is collected in storage tanks. The uncondensed gases, after Horizontal Condensers, pass into the Uncondensed Gas Tank. The uncondensed gases are used in heating of the Reactor and the excess uncondensed gases are transferred to the Flaring System. The flaring is done at top of the Stack (installed for dispersion of emission from the burners) after passing the uncondensed gas through Packed Bed Scrubber. The oil from the oil tanks is passed into the oil separation tank for condensed water and oil separation. The condensed water mixed with oil is used during the initial heating of the Reactor through the burners. The collected oil is then transferred to the storage tanks (25 KL x 3 nos.) which has vents at the top.

The tyre pyrolysis is carried out in batches. The unit representative informed that the Pyrolysis Reactor capacity is of about 7 to 12 MT of Tyre wastes per batch and batch period is of 22-27 hours depending upon types of tyres (nylon or radial) and quantity being fed into the Reactor. Smaller the size of tyre pieces higher the tyre quantity loading into the Reactor.

Each batch starts with loading of tyre or tyre pieces (along with embedded steel mesh) into the Reactor followed by closure of gate of the Reactor. The loading may usually takes about 2-3 hours. Once the gate is closed, indirect heating of the Reactor is started with the oil fired burner and oil (containing condensed water too) derived from the tyre pyrolysis process is used as fuel. During thermal decomposition of tyre waste in the Reactor, the pyrolysis gases starts liberating at about 120 °C and the Reactor temperature is maintained to maximum of 500 °C. The gases so produced are condensed in the condensers and collected in tanks along with the moisture/condensed water. The heating is switched from oil to uncondensed pyrolysis gases as soon as the same is produced during heating of the Reactor. The Reactor heating is of about 9-12 hours. After this, cooling of the Reactor is carried out for about 10-14 hours during which Nitrogen gas purging is done in the Reactor when the Reactor temperature is cooled to about 70 °C and thereafter Carbon Black Powder from the Reactor is packed into jumbo bags. The Reactor is kept rotating during cooling cycle and air is passed through the Blower at bottom of the Reactor and hot air from top of the Reactor is dispersed through the Stack. Once the Reactor temperature falls below 50°C, gate of the Reactor is opened and Steel Scrap is unloaded using Telescopic Handler Tractor.

For Nitrogen gas purging into the Reactor, the unit uses Nitrogen Gas Cylinders which are brought in front of gate of the Reactor. The Reactor gate has arrangement for pipe connection to transfer Nitrogen gas from the cylinders. Usually, 2-3 Nitrogen Gas Cylinders (capacity of 7 m³) are used in each batch while Reactor keeps rotating.

Bagging of Carbon Black powder from the reactor is carried out by placing jumbo bags in a pit in front of gate of the Reactor. The Reactor gate has arrangement for flexible pipe connection to transfer Carbon Black powder from the Reactor to the Jumbo Bags without opening the Reactor gate. The Reactor is rotated in reverse direction for transfer of carbon black from reactor to the jumbo bag through a pipe connected to the gate of reactor and in this operation Reactor gate remains locked. The Spiral Winding arrangement in the Reactor channelizes the same towards gate side of the Reactor and towards opening where the flexible pipe is attached to the Reactor gate. The transfer of Carbon Black Powder from the reactor to jumbo bag is carried out mechanically without

any manual intervention except placing of flexible pipes into the Reactor gate, placing of jumbo bags and fastening of jumbo bags when filled.

The unit has installed an Effluent Treatment Plant of capacity 0.5 KLD. It has a Chemical Dosing Tank, Settling Tank and Carbon and Sand Filter. The treated water will be used for gardening within the plant premises.

Photographs of various plant & machineries are given in Appendix.

There is a Diesel Generator set of 63 KVA with acoustic enclosure.

4. Safety Arrangement

- A bypass pipe arrangement has been made from Reactor gate to the Primary oil Tank to facilitate the gases from the Reactor to directly bypass to the Primary Oil Tank (which is connected to various condensers, Uncondensed Gas Collection Tank and flaring system) in the event of choking/blockage in the Reactor end or the Bellow fitted to the Reactor. Pressures of the Reactor and Primary Oil Tank are measured and in the event of differential pressure of more than 0.02 kg/cm² between the same, the said bypass arrangement gets activated and also burners gets switched off. A PLC based arrangement has been installed for the said safety activation.
- One Sensor for Methane and CO has also been installed fitted with Hooter system inside the plant shed.
- The workers of the unit were observed using PPE such as boots, helmets and gloves.

5. Fire Safety Arrangement

The unit has installed 09 nos. of Foam based Fire Extinguisher at various locations within the plant premises and one powder based Fire extinguisher in the plant shed.

6. Operational Parameters during the Study Period:

During the inspection, about 7.1 Tons of Tyre wastes was fed into the reactor. The feeding into the Reactor was carried out during at 7:00 AM (Day 1 – 07.02.2021) and the batch was completed at completed at 9:45 PM (Day 2 – 08.02.2021). Readings of temperatures and pressures from the digital display system connected to temperature and pressure sensors along with heating, cooling, Nitrogen Gas purging, Carbon Black Powder Bagging and Steel Scrap removal periods are given in Table 2.

Table 2: Various activities during Tyre Waste Pyrolysis and readings of temperatures and pressures

Date	Time	Temperature		Pressure kg/cm ²		Activities
		Primary Tank	Pyrolysis Reactor	Primary Tank	Pyrolysis Reactor	
07.02.2021	7.00 PM To 9.50 PM					Tyre Feeding to the Reactor
	9.55 PM	33	36	0.02	0.01	Heating of the Pyrolysis Reactor started by switching on the Burners
	10.45 PM	34	46	0.02	0.01	
	11.30 PM	35	55	0.02	0.01	
12.15 AM	39	85	0.02	0.01		
08.02.2021	1.10 AM	52	120	0.13	0.13	Cooling of the Pyrolysis Reactor started by switching off the Burners
	2.15 AM	94	183	0.32	0.31	
	2.51 AM	125	239	0.35	0.31	
	3.52 Am	190	312	0.29	0.29	
	4.59 AM	378	418	0.33	0.32	
	5.50 AM	344	402	0.20	0.19	
	6.50 AM	376	449	0.30	0.30	
	7.24 AM	341	491	0.26	0.26	
	8.10 AM	206	444	0.02	0.02	
	12.30 PM	46	151	0.02	0.01	
	1.30 PM	44	128	0.02	0.01	
	2.30 PM	43	108	0.02	0.01	
	3.30 PM	43	94	0.02	0.01	
	4.30 PM	42	82	0.02	0.01	
	5.30 PM	41	75	0.02	0.01	
	6.30 PM	40	69	0.02	0.01	<ul style="list-style-type: none"> • 1st Nitrogen purging process started at 6.30 PM and ended at 6.40 PM • 1st Carbon Bagging process started at 6.45 PM and ended at 7.40 PM • 2nd Carbon Bagging started at 7.45 PM and ended at 8.45 PM • 2nd Nitrogen purging started at 8.00 PM and ended at 8.15 PM
	7.30 PM	38	62	0.02	0.01	
	8.30 PM	37	57	0.02	0.01	Opening of Reactor Gate and Steel Scrap unloading from the Reactor.
	9.08 PM	36	55	0.02	0.01	
	9.20 PM To 9.45 PM					

7. Inputs and yields during the Tyre Waste pyrolysis process:

Details of input and yields from the said batch 26 hours 45 minutes are as below:

- (i) Tyre Wastes Fed into the Pyrolysis Reactor – 7100 kg
- (ii) Oil retrieved - 2660 kg
- (iii) Carbon Black Powder retrieved – 2450 kg
- (iv) Steel Scrap extract retrieved – 1050 kg
- (v) Condensed water collected in oil collection tanks – 50 L

8. Monitoring & Sampling

The unit premises is of about 33,000 sq. ft. and surrounded by other units except at North side where there is a road. The plant shed is about 5000 sq. ft. (west end of the unit premises) wherein the Reactor, various Condensers, Uncondensed Gas Collection Tank and oil collection Tanks are placed. The shed is fully open from the front side, fully enclosed from the back side and half enclosed from both sides of shed. Storage Tanks (25 KL x 3 nos.) are placed near North boundary of the unit premises and adjacent to the plant shed. There is a 1000 sq ft. shed for storing Carbon Black Powder and Steel Scrap. The Tyre Wastes are kept in open spaces of the plant premises.

The layout of different sections in the plant premises are shown in map in Fig 3.

Fig. 3: Layout of different sections in the plant premises of M/s Excel Industries (Unit-2) in Phase -1, Laxmi Industrial Area, Hatkanangale, District Kolhapur



8.1 Ambient Air Quality Monitoring:

Selection of Ambient Air Quality Monitoring Stations were done based on field conditions, site suitability and disrupted power supply availability and three stations (viz. within plant premises at about 45 m aerial distance towards NE direction; outside boundary of the plant premises at about 10 m aerial distance towards SE direction, and; outside boundary of the plant premises at about 50 m aerial distance towards NW direction of the Pyrolysis Reactor) were selected. Locations of the said three Ambient Air Quality Monitoring Stations are shown in google map in Fig. 4.

Ambient Air Quality Monitoring at these three stations were carried out for 24 hours starting from heating of the Tyre Pyrolysis Reactor for parameters viz. PM10; PM2.5; CO; Total VOCs and Benzo(a)pyrene. The predominant wind direction was observed towards South-West.

Fig. 4: Locations of the three Ambient Air Quality Monitoring Stations are shown in google map



8.2 Work Zone Monitoring:

Work zone air quality was monitored at three different locations for 08 hours for PM10; PM2.5; CO; Total VOCs (TVOC) and Benzo(a)pyrene. These locations are (i) SE direction of the Reactor; (ii) Behind the Reactor & near to the Condensers & Condensed Gas Tank i.e. West Side at the back of the Reactor, and; (iii) Near to middle and North side of the Reactor. The same have been named as Work Zone- Station 1, 2 and 3 respectively.

TVOC monitoring were also carried out near the Oil Storage Tank area where 25 KL x 03 nos. of Oil Storage Tanks are installed as well as near the Reactor while Carbon Black Powder bagging and Reactor gate opened for steel scrap unloading.

8.3 Oil Sampling

The oil derived from the Tyre Waste pyrolysis process were sampled for analysis of Sulphur; Calorific Value; Sediment; Lead; Arsenic; Nickel; Cadmium; Chromium; PAH; Total Halogens; PCBs, and; Water Content.

9. Analysis Results

Analysis results of various parameters monitored & analysed by Laboratory – M/s Bureau Veritas India Pvt. Limited is given at Annexure-V. The work zone air quality results at various locations are compiled and tabulated as below:

Table 3: Work-zone Air Quality Results at various locations

Sl. No.	Station	Duration of Sampling	Analysis Results				
			PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Benzo(a) pyrene ^a (ng/m ³)	CO ^b (mg/m ³)	TVOC (ppm)
1.	Station 1 (Near Reactor and towards SE direction of the Reactor)	03:00 PM to 11:00 PM (08/2/2021) During cooling of the Pyrolysis Reactor, Nitrogen purging, Carbon Black Powder bagging and opening of Reactor gate for steel scrap unloading	56.3	22.6	< 2	<1	0.1 to 0.5
2.	Station 2 (Near to the Condensers & Condensed Gas Tank i.e. West Side of the Reactor)	10:05 PM (07/2/2021) to 6:05 AM (08/2/2021) During heating of the Pyrolysis Reactor	58.1	22.9	< 2	< 1	0.4 to 1
3.	Station 3 (Near to middle and North side of the Reactor)	9:50 PM (07/2/2021) to 5:50 AM (08/2/2021) During heating of the Pyrolysis Reactor	55.4	22.1	< 2	< 1	0.2 to 0.5

^a 1ng/m³ as Limit of Quantification

^b 2mg/m³ as Limit of Quantification

- (i) TVOC results in front of the Reactor door (near door) while door opened for steel scrap removal from the Reactor are 0.2 - 0.8 ppm. The TVOC results (at about 2 m distance in front of the Reactor) while loading Carbon Black from Reactor to bag and while door opened for steel scrap removal from Reactor are 0.2-0.9 ppm and 0.1-0.2 ppm respectively.
The TVOC results near the Oil Storage Tank area (where 25 KL x 03 nos. of Oil Storage Tanks are installed) are 0.1-0.2 ppm.
- (ii) The monitored ambient air quality parameters reveal that the same are complying with the respective concentration prescribed under the National Ambient Air Quality Standards notified vide B-29016/20/90/PCI-I dated 18/11/2009 under the Air (Prevention and Control of Pollution) Act, 1981. Calorific value of the same has been reported as 9100 g/Cal.
- (iii) The analysis results of oil derived from the Tyre Waste pyrolysis process reveal that it meets the prescribed "Specification of fuel derived from waste oil" notified under Part B of Schedule V of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

10. Observations:

- (a) Health assessment of workers and survey of persons in the adjoining areas (within 1 km radius) through questionnaire may not be applicable in this plant as the operation was resumed its operation only on the day of monitoring (i.e. 07/2/2021) after direction dated 21/12/2019 to close down the production. Further, the unit operated only for about 03 months i.e. w.e.f. 16/9/2019 prior to such closure direction.
The CPCB and NEERI officials didn't observed impacts on their health (like eye irritation, nausea, headache, etc.) while in the plant during the two days of study periods. However, odour was felt in the plant shed to the scale of 4 (when rated at scale of 10) and scale of 1-3 at various other locations of the plant premises.
- (b) Additional Fire Fighting arrangement like Sprinkler system, Fire Hydrant, etc. may require to be installed and necessary clearance from the concerned Fire Department be obtained by the plant operator.
- (c) Although the plant operator claims that condensate water will be used along with oil for initial heating of the Tyre Pyrolysis Reactor but the MoEF&CC's SOP stipulates that such condensate be treated in suitable ETP. In this regard, in the installed ETP, there is need to install O&G Trap and Treated Water Collection Tank. Further, analysis be carried out for generated waste water generated and treated waste water vis-à-vis its suitability for gardening.
- (d) Small fugitive emissions (from combustion of fuel) from outer jacket of the Reactor was observed due to damage of glass wool packing in the Reactor. The same needs to be properly packed.

- (e)
- (i) Fugitive emissions were observed for a short duration of about a minute while opening Reactor gate for Steel Scrap unloading.
 - (ii) No significant visual fugitive emission was observed while unloading of Carbon Black Powder from the Reactor. Minor Carbon Black Powder spillage was observed on floor while manual fastening of filled jumbo bags. The same are cleaned using vacuum cleaner.
- However, analysis results, as given at Table 3, reveal that the 8 hours Time Weighted Average (TWA) does not show significant changes in PM10, PM2.5, CO and Benzo(a)pyrene during heating of the Pyrolysis Reactor or during cooling of the Pyrolysis Reactor, Nitrogen purging, Carbon Black Powder bagging and opening of Reactor gate for steel scrap unloading.
- The TVOC results reveal that the same have higher concentration near to the Condensers & Condensed Gas Tank (i.e. West Side of the Reactor) as compared to the other work-zone locations.
- (f) The provisions stipulated in the MoEF&CC's SOP about degassing/cooling and to that of Consent to Operate (CTO) do not sync with each other as CTO stipulates for Carbon Dioxide gas for degassing of the Reactor whereas the MoEF&CC's SOP stipulate for Nitrogen purging.
 - (g) The unit shall also obtain authorization under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, for handling, storage and processing of Tyre Wastes and generation, storage, packaging and selling/disposal of used oil from DG set and other hazardous wastes generated to authorized recyclers/disposal facility operators.
 - (h) The plant operator informed that Oil; Carbon Black Powder, and; Steel scrap are sold through traders for use as fuel in Pharma, Cement, Foundry Furnace, etc. industries; Cement Plant, and; metal industries respectively.



(Bharat K Sharma)
Regional Director
Central Pollution Control Board
Regional Directorate Pune,



(K V George)
Scientist & Head - APC Division
National Environmental Engineering
Research Institute, Nagpur

Dated : 25/2/2021

MAHARASHTRA POLLUTION CONTROL BOARD**REGIONAL OFFICE KOLHAPUR**

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Red/S.S.I/

Date: 13/09/2019

Consent No: RO-KOLHAPUR/CONSENT/1909000399/2019

Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal of Authorization under Rule 6 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

[To be referred as Water Act, Air Act and HW (M&TM) Rules respectively].
CONSENT is hereby granted to

M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,,LAXMI
INDUSTRIAL AREA, HATKANANGALE,KOLHAPUR
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Located in the area declared under the provisions of the Water Act, Air act and Authorization under the provisions of HW (M&H) Rules and amendments thereto subject to the provisions of the Act and the Rules and the Orders that may be made further and subject to the following terms and conditions:

1. The Consent to Operate is granted for a period up to: 31-08-2020.

2. The Consent is valid for the manufacture of -

Sr. No.	Product Name	Maximum Quantity	UOM
1	Rubber Pyrolysis Oil	3800	KG/D
By Products			
2	CARBON BLACK POWDER	3500	Kg/D
3	STEEL WIRE	1500	Kg/D

3. CONDITIONS UNDER WATER ACT:

(i) The daily quantity of trade effluent from the factory shall be Nil.

(ii) The daily quantity of sewage effluent from the factory shall not exceed 1.60M³.

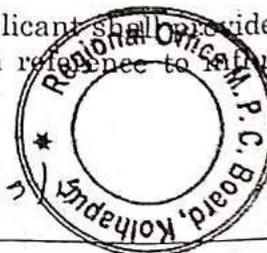
(iii) Trade Effluent Treatment: NA

(iv) Trade Effluent Disposal: NA

(v) Sewage Effluent Treatment: The applicant shall provide comprehensive treatment system as is warranted with reference to effluent quality and

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Date: 13/09/19



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operate and maintain the same continuously so as to achieve the quality of treated effluent to the following standards.

- | | | | | |
|-----|-------------------|---------------|-----|-------|
| (1) | Suspended Solids | Not to exceed | 100 | mg/l. |
| (2) | BOD 3 days 27o C. | Not to exceed | 100 | mg/l. |

(vi) **Sewage Effluent Disposal:** The treated domestic effluent shall be soaked in a soak pit, which shall be got cleaned periodically. Overflow, if any, shall be used on land for gardening / plantation only.

(vii) **Non-Hazardous Solid Wastes:**

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
01	Boiler Ash	40	Kg/D	Sell to Brick Manufacturer.

(viii) **Other Conditions:** Industry shall monitor effluent quality at outlet regularly.

4. The daily water consumption for the following categories is as under:

- | | | | |
|-------|-------------------------|-----|----------|
| (i) | Domestic | ... | 1.20 CMD |
| (ii) | Industrial Processing | ... | 0.00 CMD |
| (iii) | Industrial Cooling | ... | 1.00 CMD |
| (iv) | Agriculture / Gardening | ... | 0.00 CMD |

5. **CONDITIONS UNDER AIR ACT :**

- (i) The applicant shall install a comprehensive control system consisting of control equipments as is warranted with reference to generation of emission and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards:

A) **Control Equipment:**

1. Air Control equipment of adequate capacity shall be provided to limit the emission.
2. Industry shall provide fume extraction system followed by dust collection system to carbon black handling section (s).
3. Industry shall provide dust collector followed by wet scrubber to Pyrolysis Kilns/Reactors.
4. There shall not be any secondary (fugitive) emission.
5. Industry shall install sensors for gases like CO along with alarms set at suitable threshold limit. The necessary piping arrangements for gases along with sensors shall be done in the work environment so as ensure safe operational practices.

B) **Standards for Emissions of Air Pollutants:**

- (i) TPM Not to exceed 150 mg/Nm³.
- (ii) So₂ Not to exceed 1.2 Kg/Day.

6. **Conditions for D.G. Set : NA**

7. **Standards for Stack Emissions:**

- (i) The applicant shall observe the following fuel pattern:-

Sr. No.	Type Of Fuel	Quantity	UOM
1	Biomass Briquettes	1.0	Ton/D
2	HSD	4.0	Lit/Hr

- (ii) The applicant shall erect the chimney(s) of the following specifications:-

Sr. No.	Chimney Attached To	Height in Mtrs.
1	Reactor	6.0 or 5 meters above the Shed height which is higher side.
2	DG Set (30 KVA)	1.5 meter above the roof.

- (iii) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
- (iv) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
- (vi) Other Conditions:
- 1) The industry shall provide adequate mechanical dust collector, Scrubber to furnace.
 - 2) The industry shall not cause any nuisance in surrounding area.
 - 3) The industry shall monitor stack emissions and ambient air Quality Regularly.

8. Conditions Under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 :

- (i) The Industry shall handle hazardous wastes as specified below.

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
---------	---------------	----------	-----	----------

Industry shall not generate any hazardous waste material.

- a) Whenever due to any accident or gas leakage other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body the production process shall be stopped by taking all necessary safety measures. Industry shall also monitor the emission and ensure that the emission do not cause any harm or nuisance in the surrounding. The industry shall not restart the process without permission of the Board and other statutory organization as require under the law.

9. Specific Conditions:-

- i. Industry shall make necessary provisions for storage of carbon dioxide gas which is used for degassing of the rector to vent

- out off gases through condenser-water-burning chamber where these gases are burnt into flame. The degassing of reactor by carbon dioxide shall be done so as to ensure safe closure of the batch process.
- ii. The flue gases from burning chamber, if any specification during startup and burring of excess off gases from reactor, shall be vent out through chimney having adequate height 11 mtrs. Or as per provision of emission regulation Part-IV issued by CPCB whichever is higher.
 - iii. Industry shall be use clean fuel such a LPG/PNG during startup of the reactor.
 - iv. Industry shall ensure that there are no leakage from reactor piping so as to minimize fugitive emissions. The records of preventive maintenance schedule of burner, Reactor vessel pyrolysis chamber and allied piping shall be maintained and made available for inspection during official visits.
 - v. The pyrolysis oil condensed from the vessel shall be collected in storage tanks located in earmarked areas. The pipelines shall be equipped with floating valve so as to avoid spillage due to overflow.
 - vi. There shall not be spillage of pyrolysis oil in and around the factory premises.
 - vii. Pyrolysis oil tanks shall be provided with arrangement of dyke wall and necessary safety arrangements.
 - viii. The vent of pyrolysis oil tanks shall be equipped with adequate Capacity carbon filters so as to minimize emissions of off gases to avoid smell nuisance. The carbon filter's media (fine carbon Particle size) shall be replaced periodically to ensure effective Adsorption of gases.
 - ix. Industry shall maintain logbook which will specify plant operation time, raw material dead stock product logistics along with their specifications, logistics of carbon dioxide records of preventive maintenance etc. The records shall be made available to officials during inspections.
 - x. Industry shall make earmarked storage area for raw materials which shall be covered with shed. The storage area shall have cement concrete flooring with plinth height of 0.5 Mtrs. above the ground.
 - xi. Industry shall maintain minimum distance of 10 Mtrs. between Plant area, raw material storage area, carbon black storage area and pyrolysis oil storage area.
 - xii. Industry shall keep 10 Mtrs free passage area within work environment so as to get direct access to plant / raw material storage / carbon black storage area and pyrolysis oil storage area in case of emergencies.
 - xiii. Adequate firefighting system shall be provided as per prevailing norms laid down by competent authority.

- xiv. The industry shall comply provisions of "The Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989".
- xv. The rules and regulations notified by Ministry of Law and Justice, Govt. of India regarding Public Liabilities Insurance Act, 1991 shall be followed.
- xvi. Industry shall prepare on site and off site disasters management Plan which shall be approved by competent authorities.
- xvii. Industry shall not carry out further processing of pyrolysis oil.
- xviii. The byproducts like steel wire shall be collected properly and Stored in closed shed.

10. Industry shall comply with following additional conditions:

- i. The applicant maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.
- ii. The applicant bring minimum 33% of the available open land under green coverage/ tree plantation.
- iii. Solid waste - The non-hazardous solid waste arising in the factory premises, sweepings, etc., be disposed of scientifically so as not to cause any nuisance / pollution. The applicant take necessary permissions from civic authorities for disposal to dumping ground.
- iv. The applicant provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant to maintain compliance with the terms and conditions of the consent. In the absence, the applicant stop, reduce or otherwise, control production to abide by terms & conditions of this consent regarding pollution levels.
- v. The applicant not change or alter quantity, quality, the rate of discharge, temperature or the mode of the effluent / emissions or hazardous wastes or control equipment's provided for without previous written permission of the Board.
- vi. The applicant provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous wastes to the Board staff at the terminal or designated points and pay to the Board for the services rendered in this behalf.
- vii. The applicant make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.
- viii. The firm submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as pre the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- ix. As inspection book be opened and made available to the Board's officers during their visit to the applicant.

11. Other conditions :

- i. Suitable sensor will be installed to ensure that all gases from the Reactor have been evacuated before opening of the reactor for Transfer of carbon black / steel wire.
- ii. That the produced carbon black will be conveyed through Hydraulic / screw conveyor in closed conditions. The carbon black generated from the manufacturing process can also be conveyed / collected / handled by using any other suitable technology, provided the state Board considers the technology to be appropriate.

- iii. It shall be ensured that all the materials have been completely Removed from the reactor for which a glass inspection window with provision of lights (illumination) shall be provided at the outer enclosures of the reactor the end of the conveyor will be attached to a bagging plant where all the carbon black will be Bagged in HDPE bags and the bags will be properly sealed.
- iv. The bagging plant will be equipped with requisite air pollution Control arrangements such as dust extraction system, bag filter to Arrest all the carbon particles which may get air borne during Bagging process and a vent of minimum height of 11 m from the Ground level.
- v. Industry shall carry out ambient air quality monitoring at three Locations simultaneously within their premises in consultation with the Regional Officer to monitor RSPM, carbon monoxide and methane I ethane gases at least once in three months through a recognized laboratory or by the industry It will be ensured that monitoring Shall be carried out only during the period when the plant is in operation
12. Board reserves the right to review, amend, suspend, revoke Etc. this consent and the same be binding on the industry.
13. This consent shall not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.
14. Industry shall obtain consent to operate before starting commercial Production.
15. Industry shall obtain permission of CGWA for use of ground water.
16. The Capital investment of the industry is Rs. 95.71 Lacs.

Bank Guarantee for Tyre Pyrolysis units.			
S. No.	Condition No of consent	Bank Guarantee Amount (Rs.)	Time Period
01	Towards Provision and operation and maintenance of (Air & Water) Pollution control system	1.00 lakh	Continuous (Extend the BG of consent to Establish)
02	a) Towards provision and operation of suitable sensors for gas, temperature & pressure installed inside the reactor to regulate safe operation of the reactor & proper collection system for toxic gasses. b) Towards provision of operation of hydraulic/screw conveyor for conveyance of the produced carbon black in closed conditions.	1.00 Lakh	Continuous (Extend the BG of consent to Establish)

17. Industry shall strictly follow the guidelines for tyre Retreading & Recycling Prepared by MPCB.



Ravi 13/1/19

(R. VINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR

To,
M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,
LAXMI INDUSTRIAL AREA, HATKANANGALE,
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Received Consent fee of -

Online Payment Details (E-Payment)

Sr no.	Unique No	Description	Payment added	Transaction number	Transaction Date	Approved On	Status
1	MPCB- CONSENT- 0000064460	Consent Fee	5000.00	TXN1901001235	11-01-2019	11-01- 2019	Success



Copy submitted to:

1. The Member Secretary, MPC Board, Mumbai.
2. The Chief Accounts Officer, MPC Board, Mumbai.
3. Statistical wing/Air wing/Hazardous Management wing, MPC Board, Mumbai

Copy to :-

1. The Sub Regional Officer, MPC Board, Kolhapur.

MPCB-CONSENT-0000064460

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL OFFICE, KOLHAPUR.

Tel. No. (0231) 2652952,
2660448

Fax No. (0231) 2652952

E-mail: rokolhapur@mpcb.gov.in



Udyog Bhavan,

Near Collector Office,

Kolhapur - 416 003.

Website: <http://mpcb.mah.nic.in>

No. MPCB/RO/KOP/KOP - 445/2019

Date: 21 / 12 / 2019

To,

M/s. Excel Industries Unit -2,
Phase -1, Sector- B, Plot No. 57 to 60,
Laxmi Industrial Area, Hatkanangle,
Tal. Hatkanangle, Dist. Kolhapur.

Sub :- Directions under Section 33A of the Water (Prevention & Control of Pollution) Act, 1974 and under Section 31A of the Air (Prevention & Control of Pollution) Act, 1981.

- Ref :-
- 1) Consent to Operate granted by the Board dated
 - 2) Office Memorandum issued by MOEF & CC for Standard Operating Procedures (SOPs) With regard to recycling from waste pneumatic tyres vide F. No. 23-61/2015- HSMD, Gol vide Dtd 24/11/2015.
 - 3) Order dated 19/09/2019 passed by the Hon'ble National Green Tribunal, Principal Bench, New Delhi in O.A. Application No. 400/2019.
 - 4) Report received from Sub-Regional Officer, MPCB.

WHEREAS, it is obligatory on your part to comply with the conditions stipulated under Consent to Operate granted by the Board to your unit under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974, under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and under Rule 5 of the Hazardous Wastes (Management & Trans-Boundary Movement) Rules, 2016. AND WHEREAS, it is also obligatory on your part to provide adequate pollution control systems and operate & maintain the same continuously and effectively so as to achieve the standards prescribed under Environment (Protection) Act, 1986 and to avoid any sort of pollution problem in the surrounding area.

AND WHEREAS, it is obligatory on your part to comply with the Office Memorandum issued by MOEF & CC for Standard Operating Procedures (SOPs) With regard to recycling from waste pneumatic tyres, used PET Bottle Scrap, lead scrap / used lead scrap/used lead batteries and recovery of TPO from tyres scrap regarding vide F. No. 23-61/2015- HSMD, Gol vide Dtd 24/11/2015.

AND WHEREAS, it is obligatory on your part to comply with the order passed by the Hon'ble National Green Tribunal vide above reference (3) and submit the compliance report thereof to the Board accordingly.

AND WHEREAS, the Sub-Regional Officer of the Board at Kolhapur reported vide above reference (4) that,

1. Your unit is engaged in carrying out the Pyrolysis activities in batch process.
2. You have not obtained CHWTSDF Membership
3. You have not provided effluent treatment plant.
4. You have not provided pack packed bed scrubber.

AND WHEREAS, the Hon'ble National Green Tribunal, Principal Bench, New Delhi has passed an order on 19/09/2019 in O.A. No. 400/2019 filed by Social Action for Forest & Environment v/s. Union of India & Others wherein it is mentioned as "In most of the cases, it was observed that the reason of non-compliance is not meeting the criteria of SOP of MoEF & CC and the Consent conditions issued by the SPCBs/PCCs. In case of non-compliances actions have been initiated in the form of Closure Directions or time specific directions for improvement or notices for compliances. The remedial measures suggested are as follows".

1. Only continuous tyre pyrolysis units be allowed and all the units having batch process be asked to switch over to continuous process within a given time frame of one year and till the time of conversion their operation be stopped.
2. The feed to the continuous reactors should be in the form of tyre chips and mechanical feeding system with air lock arrangements so that no air enters in the reactor.
3. The unit should install packed bed scrubber for control of gases emission and reduction of odour.
4. If unit excess pyro gas if any should be flaring system of adequate capacity considering the emergency situation in which the entire gas may be flared the flaring should be done at a minimum height of 30 meters.
5. The tyre pyrolysis unit should strictly follow the Standards Operating Procedures (SOPs) issued by MoEF & CC for continuous process and the Consent conditions issued by SPCBs/PCCs.

NOW THEREFORE you are directed to close down the production activity forthwith till the time of conversion from batch process to continuous tyre pyrolysis activity. In case, you fail to comply with the above directions, the Board will have no any other option than to issue Closure Directions with disconnection of electricity and water supply of your unit including levy of environmental compensation, which may be noted.

FOR AND BEHALF OF M.P.C. BOARD

Ravi 21/12/2019
(Ravindra Andhale)
Regional Officer, Kolhapur.

Copy submitted to :-

1. The Joint Director (APC), MPCB, Mumbai.

Copy to :

1. The Sub-Regional Officer, MPCB, Kolhapur – You are directed to serve the directions to the industry and for necessary follow up for compliance accordingly.

MAHARASHTRA POLLUTION CONTROL BOARD
REGIONAL OFFICE, KOLHAPUR.

TEL. No. (0231) 2652952,
2660448
FAX No. (0231) 2652952
E-MAIL: ROKOLHAPUR@MPCB.GOV.IN



UDYOG BHAVAN,
NEAR COLLECTOR OFFICE,
KOLHAPUR - 416 003.
WEBSITE: HTTP://MPCB.MAH.NIC.IN

No. MPCB/RO/KOP/DIR/ 204/2019.

Date: 02/11/2019

To,

M/s Excel Industries Unit 2,
Phase-I, Sector-B, Plot No. 57 To 60,
Laxmi Industrial Area, Hatkanangale,
Tal. Hatkanangale,
Dist. Kolhapur.

Sub: Directions under section 33 A of Water (Prevention & Control of Pollution) Act, 1974, 31 A of Air (Prevention & Control of Pollution) Act, 1981 & Hazardous Waste (M & TM) Rules, 2016.

Ref : 1) Consent granted by the Board.
2) Hon'ble NGT PB, New Delhi passed order dtd. 19-09-2019.
3) Letter received from JD (APC) regarding compliance of NGT order OA 400/2019 dtd. 19-09-2019 on 25-10-2019.

WHEREAS, you are operating your industry in 'Pollution Prevention Area' under the provisions of Water (Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution) Act, 1981.

AND WHEREAS, Board has granted consent to your industrial plant subject to certain terms & conditions more precisely defined under section 26 of the Water (P & CP) Act, 1974 & under section 21 of the Air (P & CP) Act, 1981 & Hazardous Waste (Management & Transboundary Movement) Rules, 2016.

AND WHEREAS, it is obligatory on your part to provide full-fledged effluent treatment plant & Air pollution control arrangements for treatment & disposal of industrial effluent, air emissions & to operate the same round the clock so as to meet the standards prescribed by the Board under the provisions of the Water (P & CP) Act, 1974, Air (P & CP) Act, 1981 & Hazardous Waste (M & TM) Rules, 2016.

AND WHEREAS, Hon'ble National Green Tribunal, Principal Bench, New Delhi has passed an Order dtd. 19/09/2019 in O.A. No. 400/2019 filed by Social Action for Forest & Environmental v/s. Union of India & Others.

AND WHEREAS, the Sub - Regional Officer, Kolhapur has reported that your industry is engaged in carrying tyre pyrolysis activity in batch process and not complying with the standard Operating Procedures (SOP's) issued by MoEF and CC.

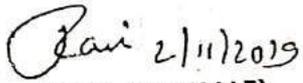
NOW THEREFORE, in exercise of the powers conferred upon me by the Board under section 33A of Water (Prevention & Control of Pollution) Act, 1974 in its 126th meeting held on 08-02-2000. I Ravindra Andhale, Regional Officer, Maharashtra Pollution Control Board, Kolhapur hereby issued following directions-

- i) You shall upgrade height of stack to 30 meters within 30 days from the date of issuance of direction.
- ii) You shall switch over from batch process to continuous process within a given time frame of one year and till the time of conversion your operation should be stopped.
- iii) You shall scrupulously follow the standard Operating Procedures (SOP's) issued by MoEF and CC and consent conditions stipulated by the Board.
- iv) You shall submit undertaking in time bound manner for up-gradation of stack height upto 30meters and also switch over the batch process to continuous process within a given time frame of one year.

You are further directed to file your compliance to these direction, in case, you fail to comply with these direction, the Board will have no option than to initiate further legal action including closure direction with disconnection of Electricity/ Water supply against your industry, which may please be noted.

This is issued with approval of competent authorities of Board.

FOR AND ON BEHALF OF THE BOARD


(RAVINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR

Copy submitted for favour of Information :-

- The Member Secretary, M.P.C. Board, Mumbai.
- Joint Director (APC), M.P.C. Board, Mumbai.
- Joint Director (WPC), M.P.C. Board, Mumbai.

Copy to-

- The Sub-Regional Officer, M. P. C. Board, Kolhapur :- You are requested to serve the direction and keep the follow up and report the compliance from time to time.
- Master file.

Annexure-III

MAHARASHTRA POLLUTION CONTROL BOARD REGIONAL OFFICE, KOLHAPUR.

Tel. No. (0231) 2652952,
2660448
Fax No. (0231) 2652952
E-mail:
rokolhapur@mpcb.gov.in



Udyog Bhavan,
Near Collector Office,
Kolhapur - 416 003.
Website: <http://mpcb.mah.nic.in>

No. MPCB/RO/KOP/SROK/Rest/ 869 /2021

Date: 01/02/2021

To,
M/s Excel Industries (Unit-2,
Phase-I, Sector-B, Plot No. 57 To 60,
Laxmi Industrial Area, Hatkanangale,
Tal. Hatkanangale,
Dist. Kolhapur.

Sub: Conditional Direction u/s 33A of Water (Prevention & Control of Pollution) Act, 1974, 31 A of Air (Prevention & Control of Pollution) Act, 1981.

- Ref :** 1) Consent granted by the Board dtd. 13-09-2019.
2) Hon'ble NGT PB, New Delhi passed order dtd. 19-09-2019.
3) Letter received from JD (APC) regarding compliance of NGT order OA 400/2019 dtd. 19-09-2019 on 25-10-2019.
4) Direction issued by the Board for compliance of SOP's dtd. 02-11-2019.
5) Direction for Closure issued dtd. 21-12-2019.
6) Industry submitted compliance vide letter dtd. 05-10-2020.
7) Undertaking submitted by the industry.

.....

We refer to the Direction of Closure issued under section 33A of Water (Prevention & Control of Pollution) Act, 1974, 31 A of Air (Prevention & Control of Pollution) Act, 1981 and under the Hazardous Waste (M & TM) Rules, 2016 as amended with respect to the non-compliance/ violations observed by Sub- Regional Office, Kolhapur. We refer to your reply requesting to grant permission to restart manufacturing activity vide reference no (7) and also conditional restart approved by competent authority of the Board.

In view of steps taken by you and compliance verified by Board Officials, you are allowed to restart your manufacturing activities subject to compliance of the following conditions.

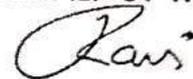
- 1) **Industry shall switch over from advanced batch process to continuous process within a given time frame of one year and submit compliance the same.**

- ii) Industry shall scrupulously follow the standard Operating Procedures (SOP's) issued by MoEF and CC and consent conditions stipulated by the Board.
- iii) Industry shall provide sufficient capacity Air Pollution Control System and same shall be operated and maintained round 'O' clock regularly.
- iv) Industry shall submit the fresh Bank Guarantee of Rs. 25,000/- towards compliance of above conditions in favour of Regional Officer, MPC Board, Kolhapur within 15 days.

These Directions are issued under the powers confirmed upon me by the Board under section 33A of Water (Prevention & Control of Pollution) Act, 1974 & 31 A of Air (Prevention & Control of Pollution) Act, 1981 with approval of competent authority. These directions shall be scrupulously followed. In case of non-compliances observed Board will have no options than to initiate stringent action including forfeiture of BG and issuance of final Directions which may please be noted.

This is issued with approval of competent authority.

FOR AND ON BEHALF OF THE BOARD



**(RAVINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR**

Copy submitted for information.

1. The Member Secretary, M.P.C. Board, Mumbai.
2. Joint Director (WPC), M.P.C. Board, Mumbai.

Copy to:

1. Law Officer, M.P.C. Board, Mumbai.
 2. Sub-Regional Officer, M.P.C. Board, Kolhapur.
- He is directed to serve the direction to the industry. MSED CO. Ltd, and irrigation dept. & keep vigilance & report the compliance accordingly.

MAHARASHTRA POLLUTION CONTROL BOARD

REGIONAL OFFICE KOLHAPUR

Phone : 0231-2652952 /2660448

Fax : 0231-2652952

Email : rokolhapur@mpcb.gov.in



Udyog Bhawan Near Collector Office,

Kolhapur - 416003

Visit At : <http://mpcb.gov.in>

Red/S.S.I/

Date: 01/02/2021

Consent No: RO-KOLHAPUR/CONSENT/2102000243/2021

Renewal of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization / Renewal of Authorization under Rule 6 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

[To be referred as Water Act, Air Act and HW (M&TM) Rules respectively].
CONSENT is hereby granted to

M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,,LAXMI
INDUSTRIAL AREA, HATKANANGALE,KOLHAPUR
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Located in the area declared under the provisions of the Water Act, Air act and Authorization under the provisions of HW (M&H) Rules and amendments thereto subject to the provisions of the Act and the Rules and the Orders that may be made further and subject to the following terms and conditions:

1. The Consent to Operate is granted for a period up to: 31-08-2023
2. The Consent is valid for the manufacture of -

Sr. No.	Product Name	Maximum Quantity	UOM
1	Rubber Pyrolysis Oil	3800	KG/D
By Products			
2	CARBON BLACK POWDER	3500	Kg/D
3	STEEL WIRE	1500	Kg/D

3. CONDITIONS UNDER WATER ACT:

- (i) The daily quantity of trade effluent from the factory shall be Nil.
- (ii) The daily quantity of sewage effluent from the factory shall not exceed 1.00M³.
- (iii) Trade Effluent Treatment: NA
- (iv) Trade Effluent Disposal: NA
- (v) Sewage Effluent Treatment: The applicant shall provide comprehensive treatment system as is warranted with reference to influent quality and

MPCB-CONSENT-0000097281

Peris

Page 1 of 7

operate and maintain the same continuously so as to achieve the quality of treated effluent to the following standards.

(1)	Suspended Solids	Not to exceed	100	mg/l.
(2)	BOD 3 days 27o C.	Not to exceed	100	mg/l.

(vi) **Sewage Effluent Disposal:** The treated domestic effluent shall be soaked in a soak pit, which shall be got cleaned periodically. Overflow, if any, shall be used on land for gardening / plantation only.

(vii) **Non-Hazardous Solid Wastes:**

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
01	Boiler Ash	40	Kg/D	Sell to Brick Manufacturer.

(viii) **Other Conditions:** Industry shall monitor effluent quality at outlet regularly.

4. **The daily water consumption for the following categories is as under:**

(i)	Domestic	...	1.20 CMD
(ii)	Industrial Processing	...	0.00 CMD
(iii)	Industrial Cooling	...	1.00 CMD
(iv)	Agriculture / Gardening	...	0.00 CMD

5. **CONDITIONS UNDER AIR ACT :**

(i) The applicant shall install a comprehensive control system consisting of control equipments as is warranted with reference to generation of emission and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards:

A) Control Equipment:

1. Air Control equipment of adequate capacity shall be provided to limit the emission.
2. Industry shall provide fume extraction system followed by dust collection system to carbon black handling section (s).
3. Industry shall provide dust collector followed by wet scrubber to Pyrolysis Kilns/Reactors.
4. There shall not be any secondary (fugitive) emission.
5. Industry shall install sensors for gases like CO along with alarms set at suitable threshold limit. The necessary piping arrangements for gases along with sensors shall be done in the work environment so as ensure safe operational practices.

B) Standards for Emissions of Air Pollutants:

- (i) TPM Not to exceed 150 mg/Nm³.
- (ii) So₂ Not to exceed 1.2 Kg/Day.

6. **Conditions for D.G. Set : NA**

7. **Standards for Stack Emissions:**

(i) The applicant shall observe the following fuel pattern:-

Sr. No.	Type Of Fuel	Quantity	UOM
1	Biomass Briquettes	1.0	Ton/D
2	HSD	4.0	Lit/Hr

- (ii) The applicant shall erect the chimney(s) of the following specifications:-

Sr. No.	Chimney Attached To	Height in Mtrs.
1	Reactor	11.00
2	DG Set (30 KVA)	1.5 meter above the roof.

- (iii) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
- (iv) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
- (vi) Other Conditions:
- 1) The industry shall provide adequate mechanical dust collector, Scrubber to furnace.
 - 2) The industry shall not cause any nuisance in surrounding area.
 - 3) The industry shall monitor stack emissions and ambient air Quality Regularly.

8. Conditions Under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 :

- (i) The Industry shall handle hazardous wastes as specified below.

Sr. No.	Type Of Waste	Quantity	UOM	Disposal
---------	---------------	----------	-----	----------

Industry shall not generate any hazardous waste material.

- a) Whenever due to any accident or gas leakage other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body the production process shall be stopped by taking all necessary safety measures. Industry shall also monitor the emission and ensure that the emission do not cause any harm or nuisance in the surrounding. The industry shall not restart the process without permission of the Board and other statutory organization as require under the law.

9. Specific Conditions:-

- i. Industry shall make necessary provisions for storage of carbon dioxide gas which is used for degassing of the rector to vent out off gases through condenser-water-burning chamber where these gases are burnt into flame. The degassing of

- reactor by carbon dioxide shall be done so as to ensure safe closure of the batch process.
- ii. The flue gases from burning chamber, if any specification during startup and burring of excess off gases from rector, shall be vent out through chimney having adequate height 11 mtrs. Or as per provision of emission regulation Part-IV issued by CPCB whichever is higher.
 - iii. Industry shall be use clean fuel such a LPG/PNG during startup of the reactor.
 - iv. Industry shall ensure that there are no leakage from reactor piping so as to minimize fugitive emissions. The records of preventive maintence schedule of burner. Reactor vessel pyrolysis chamber and allied piping shall be maintained and made available for inspection during official visits.
 - v. The pyrolysis oil condensed from the vessel shall be collected in storage tanks located in earmarked areas. The pipelines shall be equipped with floating valve so as to avoid spillage due to overflow.
 - vi. There shall not be spillage of pyrolysis oil in and around the factory premises.
 - vii. Pyrolysis oil tanks shall be provided with arrangement of dyke wall and necessary safety arrangements.
 - viii. The vent of pyrolysis oil tanks shall be equipped with adequate Capacity carbon filters so as to minimize emissions of off gases to avoid smell nuisance. The carbon filter's media (fine carbon Particle size) shall be replaced periodically to ensure effective Adsorption of gases.
 - ix. Industry shall maintain logbook which will specify plant operation time, raw material dead stock product logistics along with their specifications, logistics of carbon dioxide, records of preventive maintenance etc. The records shall be made available to officials during inspections.
 - x. Industry shall make earmarked storage area for raw materials which shall be covered with shed. The storage area shall have cement concrete flooring with plinth height of 0.5 Mtrs. above the ground.
 - xi. Industry shall maintain minimum distance of 10 Mtrs. between Plant area, raw material storage area, carbon black storage area and pyrolysis oil storage area.
 - xii. Industry shall keep 10 Mtrs free passage area within work environment so as to get direct access to plant / raw material storage / carbon black storage area and pyrolysis oil storage area in case of emergencies.
 - xiii. Adequate firefighting system shall be provided as per prevailing norms laid down by competent authority.
 - xiv. The industry shall comply provisions of "The Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989".

xv. The rules and regulations notified by Ministry of Law and Justice, Govt. of India regarding Public Liabilities Insurance Act, 1991 shall be followed.

xvi. Industry shall prepare on site and off site disasters management Plan which shall be approved by competent authorities.

xvii. Industry shall not carry out further processing of pyrolysis oil.

xviii. The byproducts like steel wire shall be collected properly and Stored in closed shed.

10. Industry shall comply with following additional conditions:

- i. The applicant maintain good housekeeping and take adequate measures for control of pollution from all sources so as not to cause nuisance to surrounding area / inhabitants.
- ii. The applicant bring minimum 33% of the available open land under green coverage/ tree plantation.
- iii. Solid waste – The non-hazardous solid waste arising in the factory premises, sweepings, etc., be disposed of scientifically so as not to cause any nuisance / pollution. The applicant take necessary permissions from civic authorities for disposal to dumping ground.
- iv. The applicant provide for an alternate electric power source sufficient to operate all pollution control facilities installed by the applicant to maintain compliance with the terms and conditions of the consent. In the absence, the applicant stop, reduce or otherwise, control production to abide by terms & conditions of this consent regarding pollution levels.
- v. The applicant not change or alter quantity, quality, the rate of discharge, temperature or the mode of the effluent / emissions or hazardous wastes or control equipment's provided for without previous written permission of the Board.
- vi. The applicant provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous wastes to the Board staff at the terminal or designated points and pay to the Board for the services rendered in this behalf.
- vii. The applicant make an application for renewal of the consent at least 60 days before the date of the expiry of the consent.
- viii. The firm submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as pre the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- ix. An inspection book be opened and made available to the Board's officers during their visit to the applicant.

11. Other conditions :

- i. Suitable sensor will be installed to ensure that all gases from the Reactor have been evacuated before opening of the reactor for Transfer of carbon black / steel wire.
- ii. That the produced carbon black will be conveyed through Hydraulic / screw conveyor in closed conditions. The carbon black generated from the manufacturing process can also be conveyed / collected / handled by using any other suitable technology, provided the state Board considers the technology to be appropriate.
- iii. It shall be ensured that all the materials have been completely

Removed from the reactor for which a glass inspection window with provision of lights (illumination) shall be provided at the outer enclosures of the reactor the end of the conveyor will be attached to a bagging plant where all the carbon black will be Bagged in HDPE bags and the bags will be properly sealed.

iv. The bagging plant will be equipped with requisite air pollution Control arrangements such as dust extraction system, bag filter to Arrest all the carbon particles which may get air borne during Bagging process and a vent of minimum height of 11 m from the Ground level.

v. Industry shall carry out ambient air quality monitoring at three Locations simultaneously within their premises in consultation with the Regional Officer to monitor RSPM, carbon monoxide and methane I ethane gases at least once in three months through a recognized laboratory or by the industry It will be ensured that monitoring Shall be carried out only during the period when the plant is in operation

12. Board reserves the right to review, amend, suspend, revoke Etc. this consent and the same be binding on the industry.

13. This consent shall not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.

14. Industry shall obtain consent to operate before starting commercial Production.

15. Industry shall obtain permission of CGWA for use of ground water.

16. Industry shall scrupulously follow the standard Operating Procedures (SOP's) issued by MoEF and CC and consent conditions stipulated by the Board.

17. The Capital investment of the industry is Rs. 95.71 Lacs.

Bank Guarantee for Tyre Pyrolysis units.

S. No.	Condition No of consent	Bank Guarantee Amount (Rs.)	Time Period
01	Towards Provision and operation and maintenance of (Air & Water) Pollution control system	1.00 lakh	Continuous (Extend the BG of previous consent condition)
02	a) Towards provision and operation of suitable sensors for gas, temperature & pressure installed inside the reactor to regulate safe operation of the reactor & proper collection system for toxic gasses. b) Towards provision of operation of hydraulic/screw conveyor for conveyance of the	1.00 Lakh	Continuous (Extend the BG of previous consent condition)

produced carbon black in closed conditions.		
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18. Industry shall strictly follow the guidelines for tyre Retreading & Recycling Prepared by MPCB.

Ravi

(RAVINDRA ANDHALE)
REGIONAL OFFICER, KOLHAPUR

To,
M/S. EXCEL INDUSTRIES (UNIT-2)
PHASE-1, SECTOR-B, PLOT NO 57 TO 60,
LAXMI INDUSTRIAL AREA, HATKANANGALE,
TALUKA HATKANAGLE
DIST. KOLHAPUR.

Received Consent fee of -

Online Payment Details (E-Payment)

Sr no	Unique No	Description	Payment added	Transaction number	Transaction Date	Approved On	Status
1	MPCB-CONSENT-0000097281	Consent Fee	25000.00	TXN2008002060	30-08-2020	30-08-2020	Success

Consent fees of Rs. 10,000/- is balance with the Board.

Copy submitted to:

1. The Member Secretary, MPC Board, Mumbai.
2. The Chief Accounts Officer, MPC Board, Mumbai.
3. Statistical wing/Air wing/Hazardous Management wing, MPC Board, Mumbai.

Copy to :-

1. The Sub Regional Officer, MPC Board, Kolhapur.



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:

M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-001

Report Date : 22.02.2021

Internal Sample Number : 490993

Page : 1 of 2

Sample Details:

Sample description : Ambient Air Quality

Received on : 10.02.2021

Location : AAQMS - Station 1
(Towards NE direction of the Pyrolysis Reactor)

Analysis

Commenced on : 11.02.2021

Sampling Date & time : From : 09.10 PM on 07.02.2021

Completed on : 22.02.2021

To : 09.10 PM on 08.02.2021

Relative Humidity : 48 %

Ambient Condition : Clear

Average Temperature : 18 °C

Average Wind Direction : East North East to West South West

Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards, CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	52.6	IS 5182 (Part 23) :2006 (RA: 2017)	24 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	20.4	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

.....Contd.....

Authorised Signatory

M.RAMESH
MANAGER

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- ❖ The test items will not be retained for more than 15 days from the date of issue of test report excepts in the case as required by the applicable regulations.
- ❖ The Laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the invoiced amount.
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Sl No. : 24666/2020-21



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-001

Report Date : 22.02.2021

Internal Sample Number : 490993

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.30pm	0.1	229.4
07.02.21	10.30pm	0.2	458.8
07.02.21	11.40pm	0.1	229.4
08.02.21	12.45am	0.1	229.4
08.02.21	01.40am	0.1	229.4
08.02.21	02.55am	0.1	229.4
08.02.21	03.40am	0.1	229.4
08.02.21	04.30am	0.1	229.4
08.02.21	05.45am	0.1	229.4
08.02.21	06.20am	0.1	229.4
08.02.21	07.55am	0.1	229.4
08.02.21	08.40am	0.1	229.4
08.02.21	09.35am	0.1	229.4
08.02.21	10.30am	0.1	229.4
08.02.21	11.30am	0.1	229.4
08.02.21	12.40pm	0.1	229.4
08.02.21	01.45pm	0.1	229.4
08.02.21	02.30pm	0.1	229.4
08.02.21	03.20pm	0.1	229.4
08.02.21	04.35pm	0.1	229.4
08.02.21	05.20pm	0.1	229.4
08.02.21	06.50pm	0.1	229.4
08.02.21	07.35pm	0.1	229.4
08.02.21	08.55pm	0.2	458.8
08.02.21	09.30pm	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M.RAMESH

MANAGER

Bureau Veritas India Pvt.Ltd.

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Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.

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Web : www.bureauveritas.co.in

SI No. : 15073/2020-21

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- ❖ The Laboratory's responsibility under this report is limited to proven willful negligence and will in no case be more than the invoiced amount.
- ❖ A satisfactory test report in no way implies that the product so tested is approved by NABL.
- ❖ Laboratory is not responsible for the authenticity of photocopied test reports.



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-002
Internal Sample Number : 490994

Report Date : 22.02.2021
Page : 1 of 2
Received on : 10.02.2021

Sample Details:

Sample description : Ambient Air Quality
Location : AAQMS - Station 2
(Towards SE direction of the Pyrolysis Reactor)
Sampling Date & time : From : 09.25 PM on 07.02.2021
To : 09.25 PM on 08.02.2021

Analysis
Commenced on : 11.02.2021
Completed on : 22.02.2021

Relative Humidity : 48 %
Ambient Condition : Clear
Average Temperature : 18 °C
Average Wind Direction : East North East to West South West
Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	57.1	IS 5182 (Part 23) :2006 (RA: 2017)	24 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	24.3	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

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Authorised Signatory

M.RAMESH
MANAGER

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SI No. : 24667/2020-21



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-002

Report Date : 22.02.2021

Internal Sample Number : 490994

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.40pm	0.3	688.3
07.02.21	10.40pm	0.3	688.3
07.02.21	11.40pm	0.3	688.3
08.02.21	12.55am	0.3	688.3
08.02.21	01.50am	0.3	688.3
08.02.21	02.45am	0.2	458.8
08.02.21	03.50am	0.2	458.8
08.02.21	04.40am	0.2	458.8
08.02.21	05.55am	0.2	458.8
08.02.21	06.30am	0.1	229.4
08.02.21	07.35am	0.1	229.4
08.02.21	08.45am	0.1	229.4
08.02.21	09.55am	0.1	229.4
08.02.21	10.45am	0.1	229.4
08.02.21	11.25am	0.1	229.4
08.02.21	12.30pm	0.1	229.4
08.02.21	01.35pm	0.1	229.4
08.02.21	02.55pm	0.1	229.4
08.02.21	03.30pm	0.1	229.4
08.02.21	04.50pm	0.1	229.4
08.02.21	05.30pm	0.1	229.4
08.02.21	06.40pm	0.1	229.4
08.02.21	07.55pm	0.3	688.3
08.02.21	08.45pm	0.3	688.3
08.02.21	09.40pm	0.2	458.8

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M.RAMESH
MANAGER

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Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.
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**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-003
Internal Sample Number : 490995

Report Date : 22.02.2021
Page : 1 of 2
Received on : 10.02.2021

Sample Details:

Sample description : Ambient Air Quality
Location : AAQMS - Station 3
Towards NW direction of the Pyrolysis Reactor
Sampling Date & time : From : 09.40 PM on 07.02.2021
To : 09.40 PM on 08.02.2021
Relative Humidity : 48 %
Ambient Condition : Clear
Average Temperature : 18 °C
Average Wind Direction : East North East to West South West
Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Analysis
Commenced on : 11.02.2021
Completed on : 22.02.2021

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	54.5	IS 5182 (Part 23) :2006 (RA: 2017)	24 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	21.8	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

.....Contd.....

Authorised Signatory

M.RAMESH
MANAGER

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SI No. : 24668/2020-21



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-003

Report Date : 22.02.2021

Internal Sample Number : 490995

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.45pm	0.2	458.8
07.02.21	10.50pm	0.2	458.8
07.02.21	11.55pm	0.2	458.8
08.02.21	12.35am	0.2	458.8
08.02.21	01.55am	0.1	229.4
08.02.21	02.30am	0.1	229.4
08.02.21	03.55am	0.1	229.4
08.02.21	04.50am	0.1	229.4
08.02.21	05.35am	0.1	229.4
08.02.21	06.40am	0.1	229.4
08.02.21	07.30am	0.1	229.4
08.02.21	08.35am	0.1	229.4
08.02.21	09.45am	0.1	229.4
08.02.21	10.40am	0.1	229.4
08.02.21	11.35am	0.1	229.4
08.02.21	12.20pm	0.1	229.4
08.02.21	01.30pm	0.1	229.4
08.02.21	02.45pm	0.1	229.4
08.02.21	03.35pm	0.1	229.4
08.02.21	04.40pm	0.1	229.4
08.02.21	05.25pm	0.1	229.4
08.02.21	06.30pm	0.1	229.4
08.02.21	07.45pm	0.2	458.8
08.02.21	08.35pm	0.2	458.8
08.02.21	09.45pm	0.2	458.8

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

**M.RAMESH
MANAGER**

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SI No. : 15075/2020-21

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**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045.

Report Number : BV/CHEN/21/02/1013-004
Internal Sample Number : 490996

Report Date : 22.02.2021
Page : 1 of 2
Received on : 10.02.2021

Sample Details:

Sample description : Work Zone
Location : Work Zone - Station 1
(SE direction from Adjacent of the reactor)
Sampling Date & time : From : 09.50 PM on 07.02.2021
To : 05.50 AM on 08.02.2021

Analysis

Commenced on : 11.02.2021
Completed on : 22.02.2021

Relative Humidity : 48 %
Ambient Condition : Clear
Average Temperature : 18 °C
Average Wind Direction : East North East to West South West
Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	56.3	IS 5182 (Part 23) :2006 (RA: 2017)	8 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	22.6	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8 hours monitoring for SI.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

..... Contd.....

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- ❖ The test items will not be retained for more than 15 days from the date of issue of test report excepts in the case as required by the applicable regulations.
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- ❖ Laboratory is not responsible for the authenticity of photocopied test reports.

Authorised Signatory

M.RAMESH
MANAGER

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Web : www.bureauveritas.co.in
SI No. : 24669/2020-21



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-004

Report Date : 22.02.2021

Internal Sample Number : 490996

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
07.02.21	09.55pm	0.2	458.8
07.02.21	10.20pm	0.5	1147.2
07.02.21	11.30pm	0.4	917.7
08.02.21	12.35am	0.4	917.7
08.02.21	01.30am	0.4	917.7
08.02.21	02.45am	0.2	458.8
08.02.21	03.30am	0.2	458.8
08.02.21	04.20am	0.2	458.8
08.02.21	05.30am	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M. RAMESH
MANAGER

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Web : www.bureauveritas.co.in
SI No. : 15076/2020-21



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-005
Internal Sample Number : 490997

Report Date : 22.02.2021

Page : 1 of 2

Sample Details:

Sample description : Work Zone
Location : Work Zone - Station 2

Received on : 10.02.2021

Analysis

Commenced on : 11.02.2021

Behind the Reactor & near to the Condensers &
Condensed Gas Tank

Completed on : 22.02.2021

(Towards West Side of the back of the Pyrolysis Reactor)

Sampling Date & time : From : 10.05 PM on 07.02.2021
To : 06.05 AM on 08.02.2021

Relative Humidity : 48 %

Ambient Condition : Clear

Average Temperature : 18 °C

Average Wind Direction : East North East to West South West

Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	58.1	IS 5182 (Part 23) :2006 (RA: 2017)	8 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	22.9	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

Authorised Signatory

M.RAMESH

Bureau Veritas India Pvt.Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,

Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.

Phone : +91 44 - 4967 4000, 4967 4002, 4028

Web : www.bureauveritas.co.in

Sl No. : 24670/2020-21

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**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-005

Report Date : 22.02.2021

Internal Sample Number : 490997

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
07.02.21	09.55pm	0.5	1147.2
07.02.21	10.20pm	1.0	2294.4
07.02.21	11.30pm	1.0	2294.4
08.02.21	12.35am	0.9	2065.0
08.02.21	01.30am	1.0	2294.4
08.02.21	02.45am	0.5	1147.2
08.02.21	03.30am	0.5	1147.2
08.02.21	04.20am	0.5	1147.2
08.02.21	05.30am	0.4	917.7

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

M. RAMESH
MANAGER

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**BUREAU
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TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:
M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 1 of 4

Sample Details:

Sample description : Work Zone
Location : Work Zone - Station 3
Near to middle of the Reactor
(Towards North side of the reactor)

Received on : 10.02.2021

Analysis

Commenced on : 11.02.2021
Completed on : 22.02.2021

Sampling Date & time : From : 03.00 PM on 08.02.2021
To : 11.00 PM on 08.02.2021

Relative Humidity : 27 %

Ambient Condition : Clear

Average Temperature : 27 °C

Average Wind Direction : North North West to South South East

Sample drawn by : Laboratory Representative Mr. F.Santhosh Benedict

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µg) or PM ₁₀	µg/m ³	55.4	IS 5182 (Part 23) :2006 (RA: 2017)	8 Hours	100
2.	Particulate Matter (size less than 2.5 µg) or PM _{2.5}	µg/m ³	21.1	BVILCH/ENA/SOP 017 Issue No.01/ 10.04.18	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ:(LOQ:2.0)	BVILCH/ENA/SOP 019 (NDIR analyzer)	8 Hour	04
4.	Benzo(a)Pyrene B(a)P – Particulate phase only	ng/m ³	BLQ:(LOQ:1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8 hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009.

Authorised Signatory

M.RAMESH

MANAGER

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SI No. : 24671/2020-21

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Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 2 of 4

Location: Infront of the Reactor door (near door)

Date	Time	TVOC Results (while door opened for steel scrap removal from reactor)	
		in PPM	in ug/m3
08.02.21	09.10pm	0.6	1376.6
08.02.21	09.20pm	0.8	1835.5
08.02.21	09.35pm	0.7	1606.1
08.02.21	09.45pm	0.4	917.7
08.02.21	10.05pm	0.3	688.3
08.02.21	10.15pm	0.2	458.8

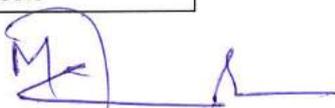
Location: Infront of the Reactor door at 2 meter distance

Date	Time	TVOC Results (while door opened for steel scrap removal from reactor)	
		in PPM	in ug/m3
08.02.21	09.10pm	0.2	458.8
08.02.21	09.20pm	0.2	458.8
08.02.21	09.35pm	0.2	458.8
08.02.21	09.45pm	0.1	229.4
08.02.21	10.05pm	0.1	229.4
08.02.21	10.15pm	0.1	229.4

Location: Infront of the Reactor door at 2 meter distance

Date	Time	TVOC Results (while loading carbon black from reactor to bag)	
		in PPM	in ug/m3
08.02.21	06.45pm	0.4	917.7
08.02.21	06.55pm	0.9	2065.0
08.02.21	07.05pm	0.8	1835.5
08.02.21	07.15pm	0.8	1835.5
08.02.21	07.30pm	0.6	1376.6
08.02.21	07.45pm	0.5	1147.2
08.02.21	08.00pm	0.4	917.7
08.02.21	08.15pm	0.3	688.3
08.02.21	08.30pm	0.2	458.8
08.02.21	08.40pm	0.2	458.8

.....Contd.....


Authorised Signatory

M.RAMESH

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TEST REPORT

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 3 of 4

Location: Near OIL Storage Tank

Date	Time	TVOC Results as Iso-Butylene	
		in PPM	in ug/m3
07.02.21	10.00pm	0.1	229.4
07.02.21	11.05pm	0.2	458.8
07.02.21	12.05am	0.2	458.8
08.02.21	01.10am	0.3	688.3
08.02.21	02.15am	0.2	458.8
08.02.21	03.00am	0.1	229.4
08.02.21	04.05am	0.1	229.4
08.02.21	05.15am	0.2	458.8
08.02.21	06.10am	0.1	229.4
08.02.21	07.05am	0.1	229.4
08.02.21	08.00am	0.1	229.4
08.02.21	09.10am	0.1	229.4
08.02.21	01.19am	0.1	229.4
08.02.21	10.15am	0.1	229.4
08.02.21	11.05am	0.1	229.4
08.02.21	12.10pm	0.1	229.4
08.02.21	01.00pm	0.1	229.4
08.02.21	02.15pm	0.1	229.4
08.02.21	03.10pm	0.1	229.4
08.02.21	04.00pm	0.1	229.4
08.02.21	05.05pm	0.1	229.4
08.02.21	06.10pm	0.1	229.4
08.02.21	07.15pm	0.2	458.8
08.02.21	08.00pm	0.2	458.8
08.02.21	09.55pm	0.2	458.8

.....Contd.....

Authorised Signatory

M.RAMESH
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**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/02/1013-006

Report Date : 22.02.2021

Internal Sample Number : 490998

Page : 4 of 4

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m3
07.02.21	09.55pm	0.3	596.6
07.02.21	10.20pm	0.5	1147.2
07.02.21	11.30pm	0.5	1147.2
08.02.21	12.35am	0.5	1147.2
08.02.21	01.30am	0.4	917.7
08.02.21	02.45am	0.4	917.7
08.02.21	03.30am	0.4	917.7
08.02.21	04.20am	0.3	596.6
08.02.21	05.30am	0.2	458.8

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: S.saran

Authorised Signatory

**M.RAMESH
MANAGER**

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TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:

M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045.

Report Number : BV/CHEN/21/02/1012-001
Internal Sample Number : 490987

Report Date : 20.02.2021

Page No. : 1 of 2

Sample Details:

Sample Description : Pyrolysis Oil
Quantity : 2.5 L
Sampled By / Date : Bureau Veritas Representative Mr. F.Santhosh Benedict
Sampling Data Sheet dated : 08.02.2021
Sample Location : M/s. Central Pollution Control Board.,
Regional Directorate, Row House No. 1,
Nisarg Vihar, Balewadi, Pune - 411 045.
Sampling Procedure : BVILCH/QMS/SOP-012

Received On : 10.02.2021

Commenced On : 11.02.2021

Completed On : 20.02.2021

Sl. No.	Test Parameters	Unit of Measurement	Results	Method of Testing/ Instrument used
1.	Lead as Pb	mg/kg	BLQ (LOQ:1.0)	USEPA 3031
2.	Arsenic as As	mg/kg	BLQ (LOQ:1.0)	
3.	Cadmium as Cd	mg/kg	BLQ (LOQ:1.0)	
4.	Nickel as Ni	mg/kg	BLQ (LOQ:1.0)	
5.	Chromium as Cr	mg/kg	BLQ (LOQ:1.0)	
6.	Sulphur Content	% by mass	0.12	ASTM D 129 - 13
7.	Calorific Value	Cal/g	9100	ASTM D 240 - 14
8.	Sediments	% by mass	0.20	ASTM D 4988
9.	Total Halogens as Cl	mg/kg	683	USEPA 5050
10.	Water Content	% by mass	BLQ (LOQ:0.05)	ASTM D 95 - 13

..... Contd.

Authorised Signatory

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Sl No. : 24680/2020-21

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TEST REPORT

Report Number : BV/CHEN/21/02/1012-001

Report Date : 20.02.2021

Internal Sample Number : 490987

Page No. : 2 of 2

Sl. No.	Test Parameters	Unit of Measurement	Results	Method of Testing/ Instrument used
11.	Polychlorinated Biphenyls	mg/kg	BLQ (LOQ:1.0)	USEPA 8082 A
12.	Polynuclear Aromatic Hydrocarbons	% by mass	BLQ (LOQ:0.01)	USEPA 8100

BLQ - Below Limit of Quantification / LOQ - Limit of Quantification.

.....End.....
Report Prepared by: S.saran.

Authorised Signatory

M.RAMESH

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Bureau Veritas India Pvt.Ltd.

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Appendix

Photographs taken during the study of M/s Excel Industries (Unit-2), Phase-1, Sector-B, Plot No. 57 to 60, Laxmi Industrial Area, Hatkanangale, Kolhapur (Maharashtra) during Feb 7-8, 2021



AAQM Station Location – 01



AAQM Station Location – 02



AAQM Station Location – 03



Stockyard



Tyre Cutter



Loading of Waste Tyre into Pyrolysis Reactor



Pyrolysis Reactor Loaded with Tyre Waste



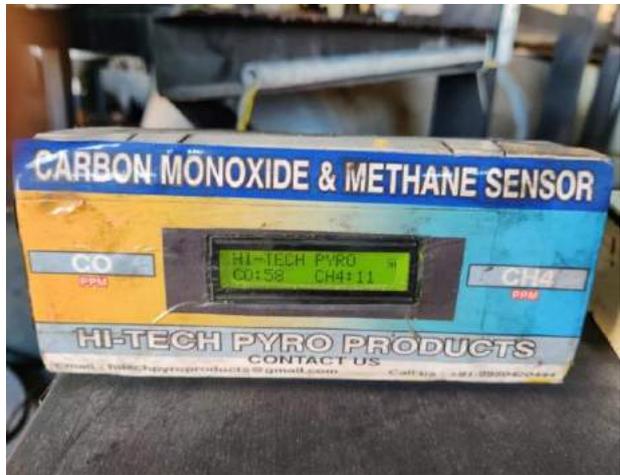
Tyre Pyrolysis Reactor



PLC Control Panel



**Digital Display of Pyrolysis Reactor
Temperature and Pressure**



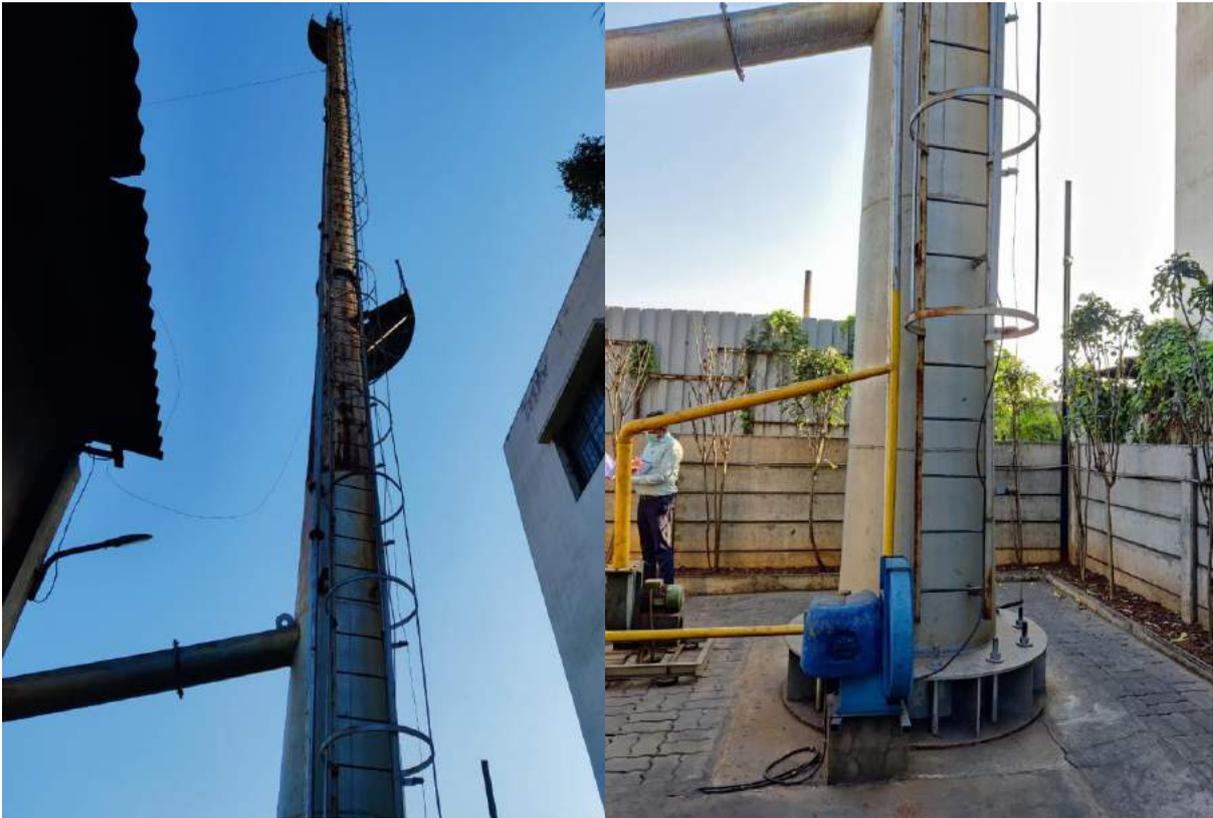
Digital Display attached to CO and CH₄ Sensors



Assembly of Condensers



Oil Storage Tanks



Stack Attached to Condenser



Nitrogen Purging before Opening the Reactor Gate



Fugitive emission on opening the reactor gate



Unloading of Steel Scrap



Steel Scrap Loaded on the Trolley



Carbon Black powder Bagging from the Reactor



Vacuum Cleaner used to Clean Carbon Black Spillage



Pyrolysis Unit Workers Wearing PPE



Central Pollution Control Board

Regional Directorate (Central) Bhopal

Inspection Report of M/s. Narmada Industries, Siltara Industrial Area Phase-2, Raipur(CG).

A. Background

With reference to the email received from CPCB, HO, Delhi dt. February 01, 2021 in the matter of Hon'ble NGT Original Application No. 400 of 2019 in Social Action for Forest & Environment (SAFE) verses Union of India & Ors. Shri. Milind Kumar Nimje 'Scientist C' & Shri. Praveen Kumar Jain, 'Scientist B' from CPCB, Regional Directorate Bhopal along with Shri. Prassana Sonkar, Assistant Environmental Engineer from CECB, Regional office, Raipur and expert member Dr. K V Gorge, Senior Principal Scientist, NEERI, Nagpur carried out joint inspection of M/s Narmada Industries, Manurethi Road, Siltara Phase -2, Raipur, Chhattisgarh during 9th to 11th February 2021. Shri. Manish Agrawal, proprietor of the plant accompanied during visit.

During the visit the team members inspected the entire Tyre Pyrolysis plant including raw material storage area, tyre cutting machine, tyre Pyrolysis reactor in accordance with the protocol developed for the study and understand the manufacturing process and probable pollution generation sources. The photographs taken during the visit are enclosed at **Annexure-I**.

CPCB Regional Directorate Bhopal has engaged M/s Anacon Laboratory, Nagpur who is a NABL&EPA recognized laboratory for monitoring of Ambient Air Quality, Work Place Monitoring and collection of Tyre Pyrolysis Oil (TPO) sample for detailed characterization.

B. Sampling and analysis

- M/s Anacon Laboratory has carried out the ambient Air Quality in the plant premises at 2 locations for 24 hours for PM₁₀, PM_{2.5}, B α P, VOCs and Work Place Monitoring at 3 locations for 8 hour time weighted average for PM₁₀, PM_{2.5}, CO, VOCs, B α P. For the purpose of air quality monitoring by the committee, the plant was made operational on the same day. Old stock of waste tyre were excavated from the heap, cut into desired pieces and loaded in the pyrolysis unit in the presence of the committee members. The work zone monitoring and ambient air monitoring was carried out on the same day February 9-11, 2021. The Laboratory also collected the Tyre Pyrolysis Oil (TPO) sample for analysis of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium, chromium nickel, PAH, total halogens, PCBs, and water content (as per schedule-V, Part B of HWM Rules, 2016).

Table 1: Ambient Air Quality Monitoring Report of M/s. Narmada Industry, Raipur(CG) (Monitoring date 9th to 11th February 2021).

Parameters	Main gate (Plant Entry)	Near the stack of Reactor 3 & 4 backside	NAAQ Standards
Particular Matter (PM ₁₀) μ g/m ³	169.38	310.67	100 (24 hr. Avg.)
Particular Matter (PM _{2.5}) μ g/m ³	54.02	72.15	60 (24 hr. Avg.)
Total VOCs (μ g/m ³)	0.111	0.132	--
Benzo-Pyrene (as B \square P) ng/m ³	BDL (DL 0.01)	BDL (DL 0.01)	1.0(Annual Avg.)

- Ambient air quality was monitored at 2 locations i.e. plant main gate and back side of reactor 3&4 stack for 24 hours for PM₁₀, PM_{2.5}, VOCs & Benzo-Pyrene. It can be seen from the above table that the PM₁₀ values are exceeding the limits at both the monitored locations, PM_{2.5} value is exceeding at one location i.e. back side of reactor 3& 4 stack and all other parameters are within the limits. The neighboring industries were also contributing to increase the ambient air quality.

Table 2: Work Zone air quality monitoring report of M/s. Narmada Industry, Raipur(CG)
(8 hour monitoring during February 9-11, 2021)

Parameters	Near Reactor 1 & 2	Near Reactor 3 & 4	Near oil Tank
Particular Matter (PM ₁₀)µg/m ³	168.0	232.0	191.0
Particular Matter (PM _{2.5}) µg/m ³	57.0	69.0	62.0
Carbon Monoxide (as CO)mg/m ³	0.572	0.634	0.590
Total VOCs µg/m ³	0.104	0.125	0.093
Benzo-Pyrene (as BαP) ng/m ³	BDL (DL 0.01)	BDL (DL 0.01)	BDL(DL 0.01)

- Work Zone air quality monitoring done at 3 locations i.e. Near Reactor 1 & 2, Near Reactor 3 & 4 and near oil Tank for 8 hours duration. The VOCs values are found in the range of 0.093 ng/m³ to 0.125 and Benzo-pyrene Below Detected Limit - (Detection Limit: 0.01 ng/m³). The PM values found in the range of 168 - 232 µg/m³ and PM2.5 values found in the range of 57 - 69 µg/m³.

Table 3: Tyre Pyrolysis Oil analysis report of M/s. Narmada Industry, Raipur(CG).

No.	Parameters	Test Result	HWR 2016 Specification as per Schedule - V Part B (fuel derived from Waste Oil)
1.	Lead (as Pb) ppm	Absent	Max. 100
2.	Arsenic (as As) ppm	Absent	Max. 5
3.	Cadmium (as Cd) ppm	Absent	Max. 500
4.	Chromium (as Cr) ppm	0.004	
5.	Nickel (as Ni) ppm	0.002	
6.	Sediment %	< 0.1	0.25
7.	Total Halogens (ppm)	146.45	4000
8.	Sulphur (%)	0.47	4.5
9.	Calorific value (Kcal/Kg)	10265	--
10.	Water Content %	< 0.1	1
11.	Poly chlorinated biphenyls(PCB)(PPM)	BDL(DL 0.01)	Max. 2000
12.	Poly Aromatic Hydrocarbon (PAH)	BDL (DL 0.03)	Max. 6 %

- The tyre pyrolysis oil analysis report reveals that all the analyzed values are within the limits..
- The detailed laboratory analysis reports of ambient air quality, work zone air quality and oil analysis reports are enclosed at **Annexure-II**.

Tyre pyrolysis oil (TPO) needs to be analysed from a petroleum laboratory, which is having facility to analyse petroleum products. This is intended to establish the Carbon number of Oil and its properties. This will help its comparison with similar other fuel oils like HSD, FO followed by its placement / ranking in the energy ladder.

C. Health Assessment details of the workers:

- For health assessment of workers working in the plant the team Interacted with 10 Nos. of workers and filled up the Questionnaire and the same is enclosed at **Annexure-III.**
- There was no villages found located in the periphery of 1 KM of the unit as the unit is located in the Siltara Industrial Area to study the impact of pollutants on health of local people in adjoining area.

D. During the visit the following points are observed

M/s. Narmada Industries is located in premises where three more industries are also operative namely M/s.Indra Metal Works, M/s.Jagdamba Power and M/s.Sagar Energy Ltd. at Siltara Phase -2 industrial area, Raipur.No boundary wall or gates are there to differentiate between these different industries. A common display board is provided at main gate for all the industries same address. The plant was situated 1 km away from any residential settlement. Industry has sufficient space in the plant premises.The process area is concrete but internal roads are kutchha. The Google map view of the plant and air quality monitoring locations is shown in **Fig. 1.**

1. The unit is involved in production of Tyre Pyrolysis Oil (TPO), carbon black and steel scrap from the scrap tyre. As per the CTO the total production capacity of Tyre Pyrolysis Oil is 6000 MTA. The unit is having 4 reactors of 5 Ton capacity each where the Pyrolysis process occurs at 150 °C and the oil produced is collected after condensation. During the visit only one reactor was made operational. The unit has installed bag filter and ventury scrubber as air pollution control devices. Carbon

black and steel scrap produced during the process as by-products are sold to open market by the unit. During process the gases are also generated, which have high calorific value. This gas is stored in two rubber balloons, which is then used as fuel in the pyrolysis reactor. The tyre pyrolysis process description with process flow chart is enclosed at **Annexure-IV**.

2. The industry has installed all the ancillary plant and machineries which are required for tyre pyrolysis plant like Tyre Cutting Machine, Reactor, Oil collection tank, Condenser tank, Compressor, Screw conveyor etc. The details of the plant and machineries is given at **Annexure-V**.
3. Consent to operate under Water and Air Acts are issued from CECB which is valid up to July 31, 2024. Copy of consent is enclosed at **Annexure-VI**.
4. Raw material (waste tyre) purchased from local market is stored in the premises. During the visit around 250 ton waste tyre and 10 ton wood chips to be used as fuel were found in the plant premises. The industry is using tanker water as a source of raw water for process as well as domestic purposes. Around 8 KL water is used in the process and 2 KL for domestic purposes.
5. There are 4 reactors installed having 5 ton capacity each to process waste tyre for production of pyrolysis oil, black carbon and iron wires used in tyre reinforcement. All the four reactors are attached through common duct with common bag filter (air pollution control device). Black carbon is a by-product which is used in ink industry, cement industry, paint industry etc. iron wires are sold in local market.
6. About 1 ton capacity Tyre cutter is installed in the premises but as per the SOP tyre with iron wire is processed in the reactor. As intimated by Sh. Manish Agrawal if without wire tyre particles deposits on the inner walls of reactor and may block the reactor therefore with wire tyre has been used in the process.
7. During the visit it was observed that the carbon was handled in the plant through screw conveyors from which jumbo bags were filled. During the carbon discharge

dust collectors were used for fugitive emission control. Industrial vacuum cleaners were used in case of any spillages.

8. The mechanized bag filling process with dust collector was installed and found effective in arresting fugitive emission and there was very less exposure occurs to the workers with carbon particles in the process. The team interacted with 10 workers in the plant and spoke about their medical history. It was informed that none of the workers had such medical history of underlying respiratory problems.
9. The plant is using nitrogen after pyrolysis process completion to purge the reactor of any pyro-gas remaining entrapped inside reactor vessel. During the visit no such escape was observed in to the atmosphere during opening of main reactor door.
10. The plant has connected the pressure release valve to the flaring system where the gas was burnt in case of emergency release. During night time gas flaring was going on the date of visit.
11. During the visit odor was observed slightly near the pyro oil storage tank and pungent smell was also observed near by the pyro gas collection balloon area. There is no odor found in other than these two areas.
12. The industry has provided dust collectors to capture the fugitive emissions from the reactor doors during carbon discharge and packing area. During visit no such fugitive emissions were observed.
13. The industry has made cemented flooring at all the plant and machinery areas. The purged water from oil seal has been collected in a pit and sent to 2 KLD capacity ETP where it was treated in a multi-step process to remove oil and carbon from the water. The purpose of installing different unit processes in the ETP is not clear. Due to paucity of time, the ETP process could not be evaluated. There is a need to understand and document the purpose of providing each unit in the ETP. The treated water has been reused in the plant. The wastewater spillages and floor washings also collected separately and treated in the same ETP. During the visit

the ETP was not in fully operational and not maintaining the records of ETP sludge etc. the ETP flow chart is enclosed at Annexure-VII.

14. Fire extinguisher installed in the process area for preventing any fire accident and the workers were found using PPEs i.e. helmet, hand gloves and mask during handling of raw materials.
15. The overall house keeping was good and plant has adequate pollution control devices.

E. Recommendations

- i. The rubber balloon for storing Pyro Gas should be repaired for any leak at the inlet outlet pipe joints. Care should be taken for timely maintenance of the rubber balloon to avoid gas leak.
- ii. A document showing the purpose of each unit process of ETP should be kept in the plant. Record of ETP operation should be maintained.
- iii. Maintain the work area free of dust by frequent sweeping (after completion of each cycle of pyrolysis operation) using suction sweeper. This will reduce the fugitive dust level.

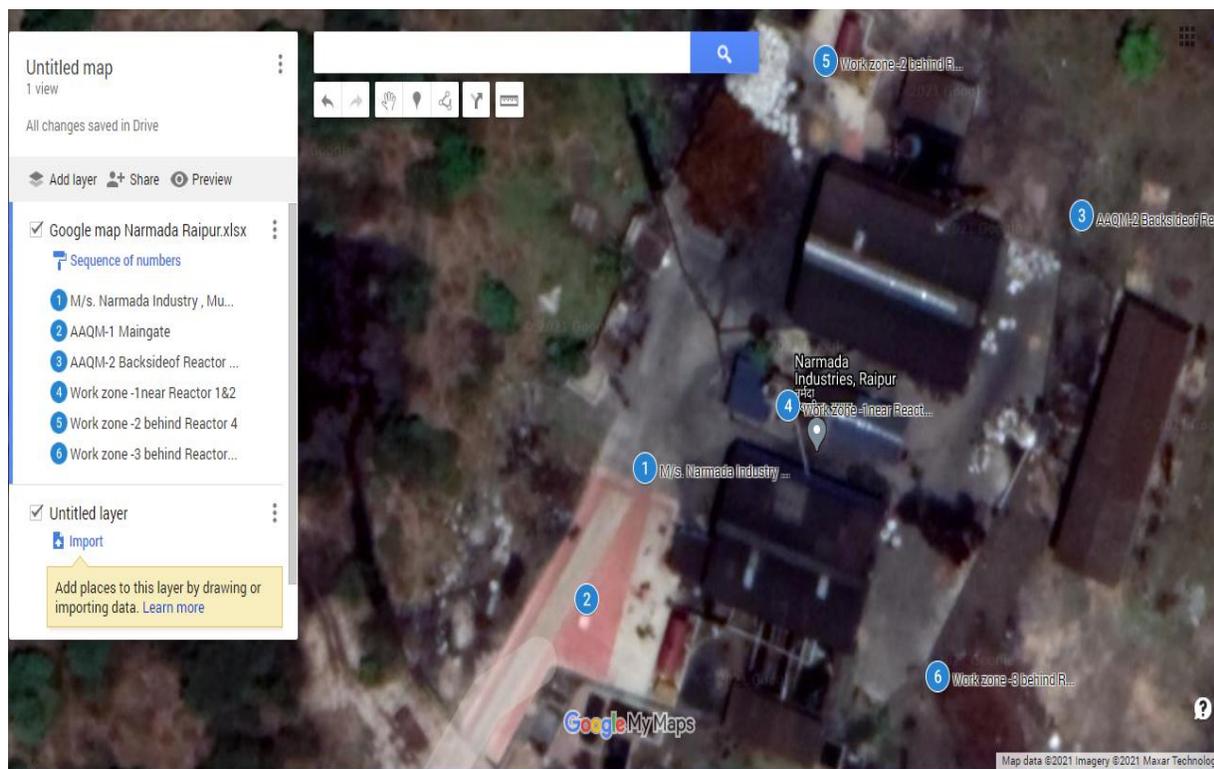
Conclusion: On the basis of above observation and recommendation the Tyre Pyrolysis plant is feasible for production of Pyro oil.


(Praveen K. Jain)
Scientist 'B',
CPCB, Bhopal

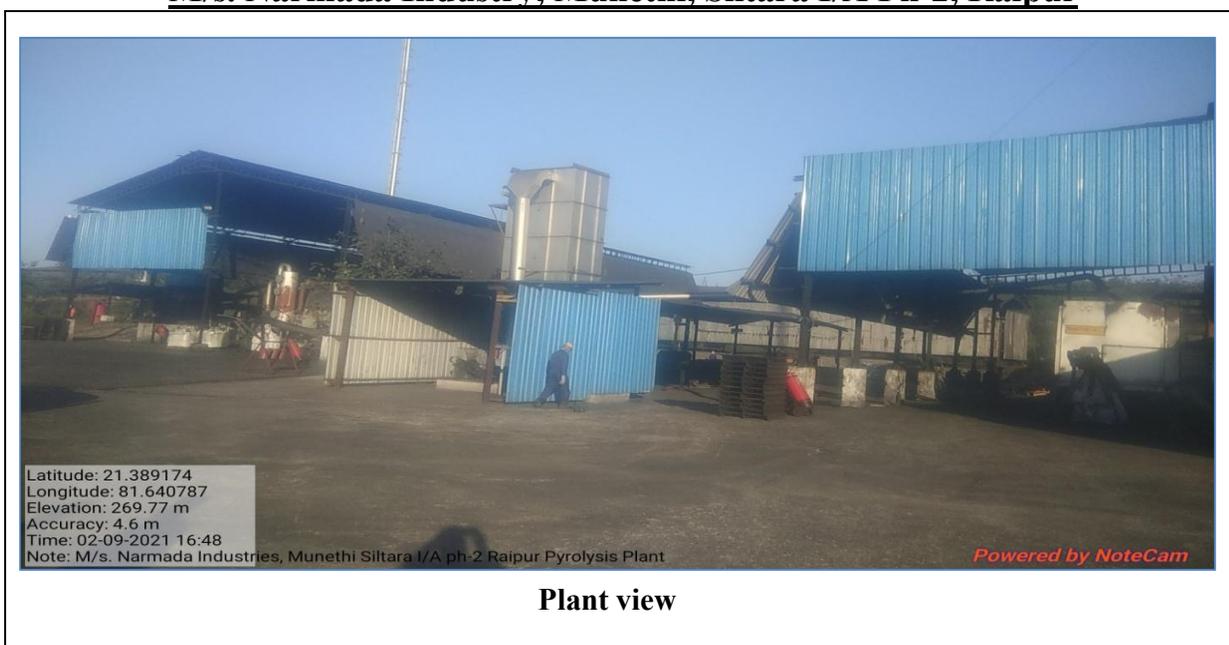

(Milind Nimje)
Scientist 'C',
CPCB, Bhopal


(K. V. George)
Committee Member
CSIR-NEERI, Nagpur

Figure 1: Google map view of M/s. Narmada Industry , Raipur (CG)



Photographs taken during the visit and monitoring time at M/s. Narmada Industry, Munethi, Siltara I/A Ph-2, Raipur





Pyro oil Collection tank



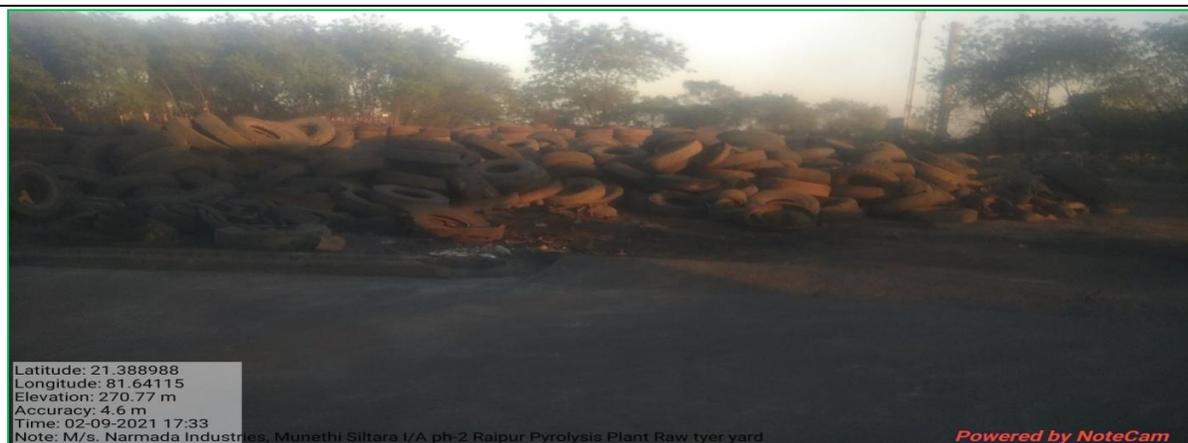
Reactor inner view



Screw conveyer Carbon Collection



Gas Collection Balloon



Raw Tyre store area



Latitude: 21.38959
Longitude: 81.640969
Elevation: 270.77 m
Accuracy: 4.6 m
Time: 02-09-2021 17:19
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Plant Carbon black yard

Powered by NoteCam



Latitude: 21.389555
Longitude: 81.64099
Elevation: 272.77 m
Accuracy: 4.6 m
Time: 02-09-2021 17:11
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Carbon

Powered by NoteCam

Inspecting team member verify the Stored Carbon black



Latitude: 21.389508
Longitude: 81.640939
Elevation: 272.77 m
Accuracy: 4.6 m
Time: 02-09-2021 17:10
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Wire Scrap yard

Powered by NoteCam

Inspecting team discuss with Plant Owner



Latitude: 21.389502
Longitude: 81.640923
Elevation: 269.77 m
Accuracy: 4.6 m
Time: 02-09-2021 17:10
Note: M/s. Narmada Industries, Munethi Siltara I/A ph-2 Raipur Pyrolysis Wire Scrap yard

Powered by NoteCam

Scrap wire Yard



Monitoring of Work Zone area (8 hour)



AAQM monitoring at Main Gate & Back



After completion of Monitoring Sample seal



Photo shows the neighboring industrial pollution of M/s. Narmada Industries , Siltara Industrial area, Raipur



Photo shows the neighboring industrial pollution of M/s. Narmada Industries , Siltara Industrial area, Raipur



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- Export inspection council (EIC): AGMARK.

TEST REPORT

Anaconuse [Signature]

Ambient Air Quality Analysis Report

Report Code: AN/AA/2021/1-2

Issue Date: 15/02/2021

Issued To : Central Pollution Control Board
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : M/s Narmada Industries
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-2
Sample Description : Ambient Air
Sample Drawn On : 10/02/2021 to 11/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Plant Entry Gate**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 24 Irs.
Ambient Temperature : 23°C
Average Flow Rate of SPM : 1.1 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
A	Particulate Matter (PM ₁₀)-A	IS:5182 (Part 23)	140.19	µg /m ³	--
B	Particulate Matter (PM ₁₀)-B	IS:5182 (Part 23)	240.42	µg /m ³	--
C	Particulate Matter (PM ₁₀)-C	IS:5182 (Part 23)	127.52	µg /m ³	--
1	Particulate Matter (PM ₁₀)-Avg.	IS:5182 (Part 23)	169.38	µg /m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	54.02	µg /m ³	60 (24 hrs)
3	Total VOCs	IS:5182 (Part 11)	0.111	µg /m ³	--
4	Benzo(a)Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng /m ³	1.0 (annual)

- Notes:-** 1) • AAQ Sampling time for A = 10:40 to 18:40, for B = 18:45 to 02:45 and for C = 02:50 to 10:50.
2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

[Signature]
Authorized Signatory

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- Export inspection council (EIC); AGMARK

TEST REPORT

Ambient Air Quality Analysis Report

Report Code: AN/AA/2021/1-1

Issue Date: 15/02/2021

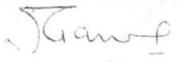
Issued To : **Central Pollution Control Board**
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : **M/s Narmada Industries**
Village : Murethi, Siltara Phase-?
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-1
Sample Description : Ambient Air
Sample Drawn On : 10/02/2021 to 11/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Stack of Reactor 3 & 4 backside**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 24 Hrs.
Ambient Temperature : 23°C
Average Flow Rate of SPM : 1.2 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
A	Particulate Matter (PM ₁₀)-A	IS:5182 (Part 23)	373.60	µg /m ³	
B	Particulate Matter (PM ₁₀)-B	IS:5182 (Part 23)	210.18	µg /m ³	--
C	Particulate Matter (PM ₁₀)-C	IS:5182 (Part 23)	348.23	µg /m ³	--
1	Particulate Matter (PM ₁₀)-Avg.	IS:5182 (Part 23)	310.67	µg /m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	72.15	µg /m ³	60 (24 hrs)
3	Total VOCs	IS:5182 (Part 11)	0.132	µg /m ³	--
4	Benzo(a)Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng / m ³	1.0 (annual)

Notes:- 1) •AAQ Sampling time for A = 2:55 to 10:55, for B = 11:03 to 19:03 and for C = 19:10 to 3:10.
2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.


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- Export inspection council (EIC); AGMARK.

Fugitive Emission Analysis Report

Report Code: AN/FE/2021/1-3

Issue Date: 15/02/2021

Issued To : Central Pollution Control Board
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : M/s Narmada Industries
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-3
Sample Description : Work Place
Sample Drawn On : 09/02/2021 to 10/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : **Nr. Reactor 1 & 2**
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 8 IIs.
Ambient Temperature : 20°C
Average Flow Rate of SPM : 1.1 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
1	Particulate Matter (PM ₁₀)	IS:5182 (Part 23)	168.76	µg/m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	57.11	µg/m ³	60 (24 hrs)
3	Carbon Monoxide (as CO)	IS:5182 (Part 10)	0.572	mg/m ³	2.0 (8 hrs)
4	Total VOCs	IS:5182 (Part 11)	0.104	µg/m ³	--
5	Benzo-Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng/m ³	1.0 (annual)

- Notes:- 1) • Work Place Sampling time = 18:00 (9/2/2021) to 2:00 (10/2/2021).
2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.


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Fugitive Emission Analysis Report

Report Code: AN/FE/2021/1-4

Issue Date: 15/02/2021

Issued To : Central Pollution Control Board
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : M/s Narmada Industries
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-4
Sample Description : Work Place
Sample Drawn On : 09/02/2021 to 10/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : Nr. Reactor 3 & 4
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 8 Irs.
Ambient Temperature : 20°C
Average Flow Rate of SPM : 1.2 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
1	Particulate Matter (PM ₁₀)	IS:5182 (Part 23)	232.25	µg /m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	69.50	µg /m ³	60 (24 hrs)
3	Carbon Monoxide (as CO)	IS:5182 (Part 10)	0.634	mg /m ³	2.0 (8 hrs)
4	Total VOCs	IS:5182 (Part 11)	0.125	µg /m ³	--
5	Benzo-Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng / m ³	1.0 (annual)

- Notes:-** 1) • Work Place Sampling time = 18:35 (9/2/2021) to 02:35 (10/2/2021).
2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

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TEST REPORT

Fugitive Emission Analysis Report

Report Code: AN/FE/2021/1-5

Issue Date: 15/02/2021

Issued To : Central Pollution Control Board
Central Zone, Bhopal
Madhya Pradesh.

Name of Site : M/s Narmada Industries
Village : Murethi, Siltara Phase-2
Raipur-492 001, Chhattisgarh

Inward No. : 2021/Mon-23-5
Sample Description : Work Place
Sample Drawn On : 10/02/2021 to 10/02/2021
Sample Drawn By : Anacon Representative
Sample Received On : 12/02/2021
Sampling Location : Nr. Oil Tank
Sampling Plan & Procedure : SOP-AAQ
Analysis Duration : 12/02/2021 to 15/02/2021
Sampling Time : 8 Irs.
Ambient Temperature : 21°C
Average Flow Rate of SPM : 1.1 (m³/min)
Average Flow Rate of Gases : 0.2 (lpm)
Weather Conditions : Clear

Sl. No.	PARAMETER	TEST METHOD	RESULT	UNIT	CPCB Standards
1	Particulate Matter (PM ₁₀)	IS:5182 (Part 23)	191.48	µg /m ³	100 (24 hrs)
2	Particulate Matter (PM _{2.5})	USEPA-40 (Part 50)	62.35	µg /m ³	60 (24 hrs)
3	Carbon Monoxide (as CO)	IS:5182 (Part 10)	0.590	mg /m ³	2.0 (8 hrs)
4	Total VOCs	IS:5182 (Part 11)	0.093	µg /m ³	--
5	Benzo-Pyrene (as BaP)	IS:5182 (Part 12)	BDL (DL 0.01)	ng / m ³	1.0 (annual)

Notes:- 1) • Work Place Sampling time = 02:15 (10/2/2021) to 10:15 (10/2/2021).

2) • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.


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TEST REPORT

Test Report No. : ALPL/13022021/03-1 dated 13.02.2021 Page 1 of 2

Issued To : M/s Central Pollution Control Board, Bhopal Narmada Industries, Satara, Phase-2, Raipur. Kind Attention : Dr. Ranu C. Verma	Sample Inward No. 2021/EG-141/01-1	Analysis Start 12.02.2021
	Inward Date 12.02.2021	Analysis End 13.02.2021
	Reference ALPL/2020-21/Proposal/Mon21-03022021-1	Sample Category General
	Reference Date 03.02.2021	
Sample Name Tyre Pyrolysis Oil	Sample Particulars / Details Not mentioned	Quantity Received 2 L.
Sample Collected By Anacon representative Mr. Ved Prakash Sharma, Date-11.02.21		Description / Physical condition/Packaging Dark brown colour liquid/Satisfactory/In sealed plastic bottle
Tests Required : Lead, Arsenic, Cadmium, Chromium, Nickel, Polychlorinated biphenyls, Sediment, Total halogens, Sulfur, Calorific value, Water content		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit		CPCB Specifications as per Schedule V Part B (Fuel derived from waste oil)	Test Result
1	Lead (as Pb)	ppm	3040 of SW-846	Max. 100	Absent
2	Arsenic (as As)	ppm	3040 of SW-846	Max. 5	Absent
3	Cadmium (as Cd)	ppm	3040 of SW-846		Absent
4	Chromium (as Cr)	ppm	3040 of SW-846	Max. 500	0.004
5	Nickel (as Ni)	ppm	3040 of SW-846		0.007
8	Sediment	%	IS 1448 (Part 30)	0.25	< 0.1
9	Total halogens	ppm	Ion Selective Method	4000	146.45
10	Sulphur	%	IS 1448 (Part 34)	4.5	0.47
11	Calorific value	Kcal/kg	IS 1448 (Part 6)	-	10265
12	Water content	%	IS 1448 (Part 40)	1	< 0.1
13	Polychlorinated biphenyls				
	2,2,5-Trichlorobiphenyl	µg/kg	GCMS/MS	Max. 2000	BDL (DL-0.03)
	2,4,4-Trichlorobiphenyl	µg/kg	GCMS/MS		
	2,2,5,5-Tetrachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,4,5,5-Pentachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,3,4,4,5-Hexachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,4,4,5,5-Hexachlorobiphenyl	µg/kg	GCMS/MS		
	2,2,3,4,4,5,5-Heptachlorobiphenyl	µg/kg	GCMS/MS		

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 • Test report shall not be reproduced except in full without prior written approval of Anacon Labs. • Liability of Anacon Labs is limited to invoiced amount only • Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise

Verified By

Authorized Signatory

Sonali Gharpure
 Technical Manager

Mangesh Fande
 Technical Manager

Shashikant Satdeve
 Sr. Chemist

Swati Shrivastava
 Technical Manager

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TEST REPORT

Test Report No. : ALPL/13022021/03-1 dated 13.02.2021

Page 2 of 2

Issued To : M/s Central Pollution Control Board, Bhopal Narmada Industries, Satara, Phase-2, Raipur. Kind Attention : Dr. Ranu C. Verma	Sample Inward No. 2021/EG-141/01-1	Analysis Start 12.02.2021
	Inward Date 12.02.2021	Analysis End 13.02.2021
	Reference ALPL/2020-21/Proposal/Mon21-03022021-1	Sample Category General
	Reference Date 03.02.2021	
Sample Name Tyre Pyrolysis Oil	Sample Particulars / Details Not mentioned	Quantity Received 2 L
Sample Collected By Anacon representative Mr. Ved Prakash Sharma, Date-11.02.21		Description / Physical condition/Packaging Dark brown colour liquid/Satisfactory/In sealed plastic bottle
Tests Required : Polynuclear aromatic hydrocarbon		

TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	CPCB Specifications as per Schedule V Part B (Fuel derived from waste oil)	Test Result
14	Polynuclear aromatic hydrocarbons (PAH)				
	Naphthalene	µg/kg	GCMS/MS	Max. 6%	BDL (DL-0.03)
	Acenaphthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Acenaphthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Flourene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Phenanthrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Anthracene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Fluoranthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(a) anthracene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Chrysene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(b) fluoranthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(k) fluoranthene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(a) pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo(ah)anthracene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Indene (1,2,3-cd) pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)
	Benzo (ghi) pyrene	µg/kg	GCMS/MS		BDL (DL-0.03)

NOTES : • Please see watermark "Original Test Report" to confirm the authenticity of this report • Results shall be referred to tested sample(s) and applicable to tested parameters only • Test report shall not be reproduced except in full without prior written approval of Anacon Labs • Liability of Anacon Labs is limited to invoiced amount only • Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise.

REMARKS : As requested by the client, sample was tested for above parameters only. The submitted sample complies with Specification CPCB Specifications as per Schedule V Part B (Fuel derived from Waste Oil) for the tested parameters.

Verified by


 Sonali Gharpure
 Technical Manager

Authorized Signatory


 Swati Shrivastava
 Technical Manager

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Butibori, Nagpur - 441 122.
 Email : support@anacon.in

Thanks for your faith and trust in our services. We at Anacon Laboratories cherish our relationship. We put in a lot of hard work to ensure that you have a seamless experience at every step of our relationship. In order to ensure that your next experience will be significantly better, we welcome your feedback over email on: feedback@anacon.in.

NARMADA INDUSTRIES

WORKS : Plot No. 129, Munrethi Road, Near Jagdamba Power and Alloy, Siltara Phase II, Raipur (C.G.)

Phone : 0771-4054754, Mob.: 97525-43700, 94255-05170

Aswinesh
III

09.02.2021

Ref.

Date :.....

TO WHOM SO EVER IT MAY CONCERN

THIS IS HERE BY TO DECLARE THAT THERE IS NO RESIDNETIAL SETTLEMENT IN RADIUS OF 1 KM OF OUR PLANT .ON THE EAST SIDE OF OUR PLANT THERE IS POWER AND STEEL PLANT ,ON THE NORTH SIDE THERE IS OPEN YARD OF STEEL INDUSTRY ,ON THE SOUTH SIDE THERE IS SPONGE IRON PLANT ,ON THE WEST SIDE THERE IS AN OPEN AREA .

WE ARE SETTLED IN SILTARA INDUSTRIAL AREA PHASE 2 WHICH IS 15KM AWAY FROM RAIPUR .

FOR NARMADA INDUSTRIES
NARMADA INDUSTRIES

Aswinesh
PROPRIETOR
PROPRIETOR

GOVERNMENT OF CHHATTISGARH



LICENCE TO WORK A FACTORY

(Form No. 3 prescribed under Rule 5 of C.G. Factories Rules 1962)

Licence No. :CG-04-1723-5/RPR-1315-5/2930/2m(i)/A/3677-1281

(Mention This Number invariably in all correspondences with this office)

Fees Paid Rs. :Rs. 53800

E-Challan No.	Amount	Date
66160819000389	45000	16/08/2019

Licence is hereby granted to **Amit Khemka** occupier of **M/S NARMADA INDUSTRIES** located at **NEAR JAGDAMBA POWER & ALLOYS LTD. MURETHI ROAD, PHASE-2, SILTARA**, District **RAIPUR**

(Subject to the provisions of the Factories Act, 1948 and the rules made there under and the conditions annexed here with)

Valid only for the premises at the above location (as per the plans approved under the Factories Act and Rules) for use as a factory employing not more than **20** (in words **Twenty Only**) / **0 (Zero Only - CPP)** workers on any one day during the year and having installed motive power **not exceeding 100** Horse Power (in words **One Hundred Only**) where the manufacturing process of **PYROLYSIS OIL BY TYRE PYROLYSIS** will be carried by him. This licence shall remain in force till the 31st day of December, **2020-2024**

Excess Fees: **225**

Place : **RAIPUR**

Date : **17/10/2019**

ANTHONY
TIRKEY
Dy. Chief Inspector of Factories

Digitally signed by
ANTHONY TIRKEY
Date: 2019.10.17
16:07:09 +05'30'

Chhattisgarh

Note: The authenticity of this certificate be verified at www.cglabour.nic.in.

(This licence shall be framed and exhibited in the factory and shall be made available to the factory Inspector on demand)

A-III

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Akshay Kumar Dubey
2.	Age/ Gender	29/ Male
3.	Address/Contact Number	Village - Murrethi, P.O. - Alhara, Dist - Raipur (C.G.) Mob - 7415680000
4.	Designation	office work
5.	Work profile	office work
6.	Working since how many years?	8 Year
7.	Whether using PPE Kit	" NA
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21

Place Village - Murrethi,
Alhara, Raipur

 09/02/21

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Firangi Lal
2.	Age/ Gender	29/ Male
3.	Address/Contact Number	Village - Kanai Sukli, Dist - Janjgir chapa (C.G)
4.	Designation	operator
5.	Work profile	operates plant
6.	Working since how many years?	3 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2021

Place Village - Mumsethi,
Raipura, Raipur


09/02/21

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sanjay Dabey
2.	Age/ Gender	
3.	Address/Contact Number	Village - Charoda, Dist - Durg (C.G.) Mob- 741 287020
4.	Designation	Plant Head
5.	Work profile	Overall Management of Plant
6.	Working since how many years?	5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 Hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21

Place Village - Munethi, Charoda
(C.G.)


 09/02/21

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Puneet Chauhan
2.	Age/ Gender	30/ Male
3.	Address/Contact Number	Village - Kukra Kapada, Dist - Raipur (C.G.) Mob-7415686000
4.	Designation	Electrician
5.	Work profile	Electric fitting work
6.	Working since how many years?	5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 Hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/04/2021
 Village - Mursali,
 Place & Hora (Raipur) C.G.


 Name & designation of inspecting officer


Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Ram Khilawan Chauhan
2.	Age/ Gender	60/Male
3.	Address/Contact Number	Village - Morwahi, Dist:- Gawala parda Morwahi (M.P.)
4.	Designation	Welder
5.	Work profile	Maintenance work
6.	Working since how many years?	8 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21

Place Murathi, Sillaha, Raipur
(C.G.)


 09/02/21

Name & designation of inspecting officer



Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Narottam Yadav
2.	Age/ Gender	29 / Male
3.	Address/Contact Number	Rithara Village - Gaula, Nandgaon, Dist:- Berhampur Mob 790743357 (NG)
4.	Designation	Welder
5.	Work profile	Maintenance work
6.	Working since how many years?	2 months
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/21
Place Munrethi, Rithara,
Raipur


Name & designation of inspecting officer
9.02.21

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Roshan Sidar
2.	Age/ Gender	28/Male
3.	Address/Contact Number	At Raigarh (C.C.)
4.	Designation	Helper of operator
5.	Work profile	Helps in operating the plant
6.	Working since how many years?	2.5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 Hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 03/07/21

Place Village-Munroethi,
Siltara, Raipur


Name & designation of inspecting officer

03.07.21

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Itwan Banjore
2.	Age/ Gender	37/ Male
3.	Address/Contact Number	Village - Desara, Dist :- Bemetara (C.G.) Mob :- 8225415936
4.	Designation	Operator
5.	Work profile	Operates the plant
6.	Working since how many years?	4 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2024

Place Village - Munsothi,
Sihora, Raipur


 Name & designation of inspecting officer
 09/02/24

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Sanjay Sahy
2.	Age/ Gender	30/Male
3.	Address/Contact Number	Village-Bhimbhori, Dist- Bemetara (C.G.) Mob:- 6268387236
4.	Designation	Operator
5.	Work profile	Operate the plant from Control room
6.	Working since how many years?	7 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 03/02/2021

Place Village - Munsohi,
Siltara, Raipur



Name & designation of inspecting officer

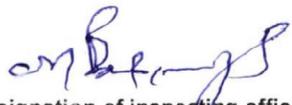
03/02/2021

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Lakeshwar Kauchik
2.	Age/ Gender	35/ Male
3.	Address/Contact Number	Village - Mandhar, Dist:- Raipur Mob :- 7415684000
4.	Designation	Fitter
5.	Work profile	Looks over maintenance of the plant
6.	Working since how many years?	5 years
7.	Whether using PPE Kit	Yes
8.	Work duration ?	8 hours
9.	Health condition (Details)	Normal
10.	In case of any health issues, specify duration of illness?	Nil
11.	Any feedback	

Date 09/02/2021

Place Village - Mandhar,
Si Hara, Raipur


 Name & designation of inspecting officer

09/02/21

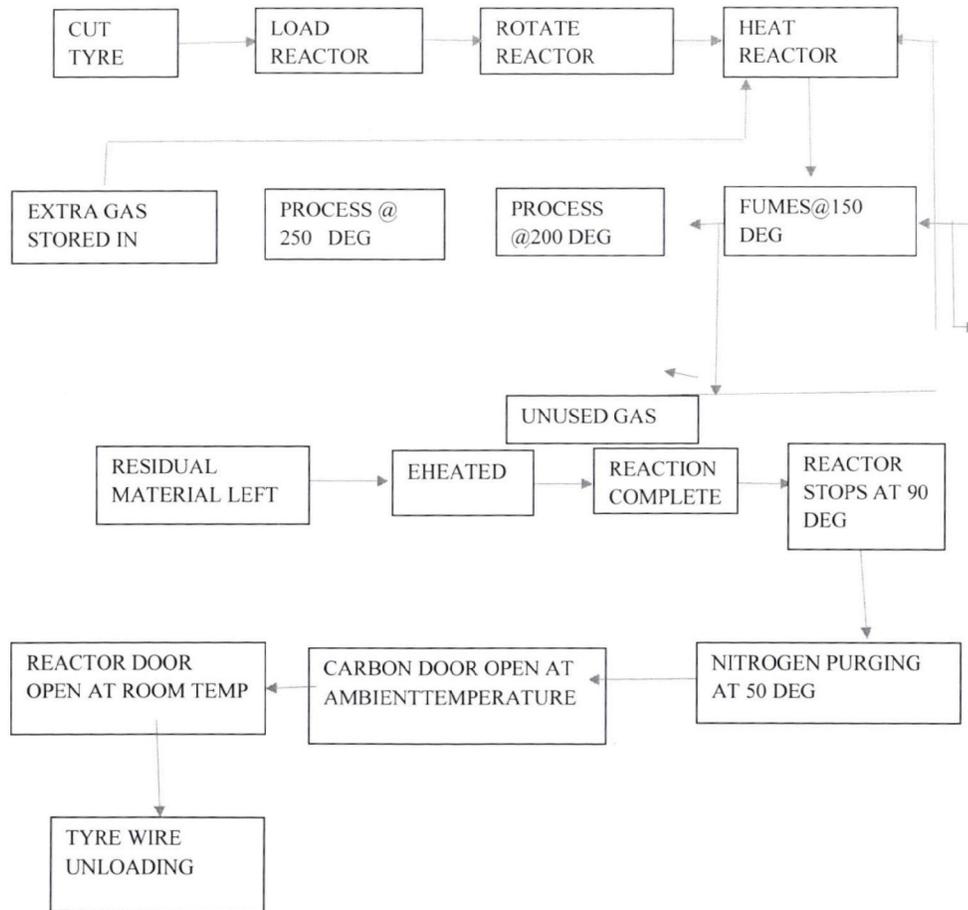
ANNEXURE-IV

Manufacturing Process description: Pyrolysis of scrap tyres offers an environmentally and economically attractive method for transforming waste tires into useful products, heat and electrical energy. Pyrolysis refers to the thermal decomposition of scrap tyres either in the absence or lack of oxygen. Scrap tyres are an excellent fuel because of their high calorific value. The process of Batch type Tyre Pyrolysis Plants is as given below:-

- The tyres are cut using machines and weighed. The cut tyres are loaded into the reactors. While loading the workers are provided with appropriate safety gears including N95 masks, goggles, gloves, safety shoes and covered clothing. The workers are rotated at regular intervals.
- Before light up, the opening of the reactor connecting to the condensing pipeline is checked. The reactor door is closed properly. Inspection of the machine parts are done.
- The process begins with rotation of reactor and heating it up with the stored gas.
- The heating continues, gases and fumes start getting produced at 150 degree Celsius. The gases move into the condensers for condensation. Uncondensed gases are reused for heating the reactors. The reactor is maintained at 200 degrees for 1.5-2 hrs and then increased to 250 degrees where it is maintained for 3 to 4 hrs. The gases after condensation get converted into oil. The extra uncondensed gases during this period are stored in the gas balloon for the next batch.
- Most of the pyrolysis process is completed at this stage, this causes the gas production to reduce eventually and the reactor temperature begins to drop. The reactor is heated again to be sure that the residual material is completely pyrolysed.
- Once the temperature starts falling, reactor runs on the residual gas which eventually shuts down and reactor temperature eventually drops to 90 degree Celsius, after which reactor rotation is stopped.
- Once the reactor temperature reaches 50-degree Celsius, reactor is purged with Nitrogen. The reactor is rotated for half an hour after Nitrogen is purged.
- Once the reactor reaches ambient temperature, the carbon door is opened. The reactor rotates in the closed chamber. The carbon dust is stored in 1 tonne carbon bags. Rotary screw conveyor is used to fill the bags. Dust collector captures the air borne carbon particles in the chamber and prevents them to be leaked to atmosphere.
- Once all the carbon black is emptied from the reactor, the main door is opened, and the steel scrap is unloaded using winch machine.

A-IX

Process flow chart of Tyre Pyrolysis plant



ANNEXURE -V

**List of Machines used in Tyre Pyrolysis Plant i.e. M/s Narmada Industries,
Siltara Industrial Area Phase-2, Raipur**

S. No.	Name of Machinery	Quantity / capacity	Dimension	Attachments
1.	Tyre Cutting Machine	02 no.	--	7.5 HP Motor
2.	Reactor	04 no.	5 ton. each 2.2 X 6 meter	--
3.	Heavy oil collector tank	04 no.	Length – 1.8x0.8 meter	connected to reactors
4.	Condensor tank	4 nos	Size - 8 x 5 meter	connected to heavy oil collector tank
5.	Processed light oil tanks	4 no.	Length -4.4 x1.05 meter	connected to condenser tank
6.	Processed heavy oil tank	4 no.	Length 1.6 x 6.5 meter	connected to heavy oil connector tank
7.	Gas flow control chamber	4 no	Length-1.65 x 8 meter,	attached to processed light oil tank
8.	Gas storage balloon	02 Capacity= 100 m3	--	connected to gas flow control chamber
9.	Compressor	01 no.		attached to gas storage balloon Motor- 7.H.P.
10.	Chimney	02 no.	Height-100 ft, diameter- 1.2 meter at bottom	----
11.	Flare stack	02 no.	---	Attachment- attached to the gas flow control chamber
12.	Screw conveyer-	4 no. Capacity- 1 tonne/hr	length- 4.6 meter, diameter-.4 meter	---
13.	Oil storage tank	4 no. Capacity-28 m ³ volume	Length – 6.35 x2.4 meter,	---
14.	Scrubber	4 no.	Length-3.1 meter, diameter -.8 meter	attached to the reactors
15.	Moisture storage tank-	2 no. volume -19 m ³	diameter-2.2 x 5 meter	----
16.	ETP tank -	01 no	length-9.2 x2.5 x2 meter	---
17.	Dust collector	01 no. 10,000 cfm		Motor 11 KW



Annexure
VI

REGIONAL OFFICE
C.G. Environment Conservation Board
New H.I.G. 9-10-11, Tatibandh, Raipur(C.G.)

No. 795- /RO/TS/CECB/2011
To,

Raipur, Dated 05/07/2011

M/s Narmada Industries

Kh.No. 119-120, Village - Munrethi,
Siltara, Phase-II, Raipur (C.G.)

Sub: Grant of consent under section 21 of the Air (Prevention and Control of Pollution) Act, 1981.

Ref: Your application received at this office-dated 07.06.2011 and subsequent correspondence ending dated 02.07.2011.

With reference to your above application, consent is hereby granted subject to the terms and conditions incorporated in the schedule annexed here to for a period of 12 months from the first day of the month of commissioning of the plant.

This consent is valid for following products & production capacity: -

	Name of Product		Production Capacity
1	Re-Processed Oil, Coaltar Pitch	☞	6,000 M.T./Year (Six Thousand Metric Ton Per Year)

Conditions: -

- 1 The date of commissioning of the industry shall be informed at least one month in advance.
- 2 Industry shall install appropriate air pollution control equipment at all points of emission and shall ensure that these are always kept running and in good working order all the time. In case of any failure it shall be immediately rectified or some alternate arrangement be made.
- 3 The industry shall burn or process the raw materials in fully closed chamber.
- 4 Emission of air pollutants from stack shall not exceed following limits
Particulate Matter - 50 mg/Nm³.
- 5 Ambient air quality at boundary of industry premises shall conform to the standards prescribed by the Board.
- 6 Minimum height of all the stacks shall not be less than 30 meter. Arrangement of porthole, platform and ladder etc shall be made for monitoring purposes at appropriate height of the stack.
- 7 The industry shall use only furnace oil as a fuel in the proposed unit as per the proposal submitted by the industry.
- 8 The industry shall provide suitable air pollution control equipment gas absorber & scrubber at the proposed unit to bring the emission up to the prescribed standard. Industry shall have to install separate electric metering arrangement for the running of all pollution control equipments.
- 9 The industry shall do extensive tree plantation in and around the factory premises for improvement of environment in general.
- 10 Industry shall adopt good house keeping practices inside the factory premises.
- 11 Industry shall submit ambient air quality monitoring report to the Board

regularly i.e. once in every six months.

- 12 The industry shall provide proper and safe arrangement for handling and disposal of solid waste.
- 13 All the raw materials, finished products, solid wastes etc. shall be stored in the platform above ground level within covered shed.
- 14 The industry shall submit land diversion certificate from competent authority within a period of one month from the date of issue of this consent letter.
- 15 All the construction activities for establishment of industry shall be carried out exclusively using fly ash bricks/blocks and other products based on fly ash as far as possible.
- 16 The industry shall obtain Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 (If required).
- 17 The industry shall take proper action to control the noise pollution. The noise level should not exceed the limit 75 dB(A) during the day time and 70 dB(A) during the night time within the factory premises.
- 18 Industry shall obtain statutory clearances/permissions from concerned central/state government departments, boards, bodies and corporations etc. before establishment of the unit.
- 19 The issuance of this consent does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or local laws or regulations.
- 20 Any change in production capacity/process/raw material used etc. shall be intimated to the board for any enhancement of the above prior permission of the Board shall be obtained.
- 21 The industry shall be commissioned within the period of five years from the date of issue of this consent letter. In case the industry is not commissioned within the stipulated period the consent shall be treated as cancelled.
- 22 The Board reserves the right to amend/Cancel any of the above conditions or add new conditions as and when deemed necessary.
- 23 This consent is valid for the stated period and has to be renewed every year. Application which annual license fee in this regard shall reach the office 4 months before the expiry of this consent.

Please acknowledge the receipt of this letter.

For & on behalf of C.G. Environment Conservation Board


Regional Officer

Regional Office, C.G. Environment Conservation Board

C.G. Environment Conservation Board
New H. H. S. U. V. Y. Farbandh,
RAIPUR (C.G.)

Endt.No. 796 /RO/TS/CECB/2011

Copy to :-

Chief Engineer (Raipur Region), Chhattisgarh State Power Distribution Company Ltd., Gudiyari for information & necessary action please. The electricity connection to the unit may be given w.r.t. above mention consent.


Regional Officer

Regional Office, C.G. Environment Conservation Board

C.G. Environment Conservation Board
New H. H. S. U. V. Y. Farbandh,
RAIPUR (C.G.)

2



**REGIONAL OFFICE
C.G. Environment Conservation Board
New H.I.G. 9-10-11, Tatibandh, Raipur(C.G.)**

No. 797 /RO/TS/CECB/2011

Raipur, Dated 05/02/2011

To,

M/s Narmada Industries
Kh.No. 119-120, Village - Munrethi,
Siltara, Phase-II, Raipur (C.G.)

Sub: Consent of the Board under Section 25/26 of the Water (Prevention and Control of Pollution) Act, 1974.

Ref: Your application received at this office-dated 07.06.2011 and subsequent correspondence ending dated 02.07.2011.

-0-

With reference to your above application, consent is hereby granted subject to the terms and conditions incorporated in the schedule annexed hereto for a period of twelve months from the first day of the month of commissioning of the plant.

This consent is valid for following products & production capacity: -

	Name of Product		Production Capacity
1	Re-Processed Oil, Coaltar Pitch	☞	6,000 M.T./Year (Six Thousand Metric Ton Per Year)

Please acknowledge the receipt of this letter.

For & on behalf of C.G. Environment Conservation Board


 Regional Officer
 REGIONAL OFFICER
 Regional Office, C.G. Environment Conservation Board
 C.G. Environment Conservation Board
 Raipur (C.G.)
 New H.I.G. 9-10-11, Tatibandh,
 RAIPUR (C.G.)

Endt.No. 798 /RO/TS/CECB/2011

Raipur, Dated 05/02/2011

Copy to :-

Chief Engineer (Raipur Region), Chhattisgarh State Power Distribution Company Ltd., Gudiyari for information & necessary action please. The electricity connection to the unit may be given w.r.t. above mention consent.


 Regional Officer
 REGIONAL OFFICER
 Regional Office, C.G. Environment Conservation Board
 C.G. Environment Conservation Board
 Raipur (C.G.)
 New H.I.G. 9-10-11, Tatibandh,
 RAIPUR (C.G.)



REGIONAL OFFICE
C.G. Environment Conservation Board New H.I.G. 9-10-11, Tatibandh,
Raipur(C.G.)

CONSENT LETTER

No.2444 /RO/TS/CECB/2011

Raipur, Dated 05/07/2011

Sub: Consent **M/s Narmada Industries, Kh.No. 119-120, Village - Munrethi, Siltara, Phase-II, Raipur (C.G.)** for the discharge of effluent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974.

Ref: Your application received at this office-dated 07.06.2011 and subsequent correspondence ending dated 02.07.2011.

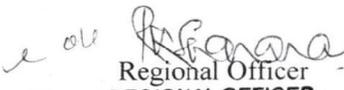
of **M/s Narmada Industries, Kh.No. 119-120, Village - Munrethi, Siltara, Phase-II, Raipur (C.G.)** (expiry date.....)

- 1 With reference to the above application for consent to discharge effluent into the natural water courses under the Water (Prevention & Control of Pollution) Act, 1974, here-in-after referred to as the Act **M/s Narmada Industries, Kh.No. 119-120, Village - Munrethi, Siltara, Phase-II, Raipur (C.G.)** is authorized by the State Board to discharge its industrial and other effluents arising out of their premises into the local stream/river/well in accordance with the general and special conditions as mentioned in the Annexure.
- 2 This consent shall be valid for **12 months from the first day of the month of commissioning of the plant.**

This consent is valid for following product & production capacity: -

	Name of Product		Production Capacity
1	Re-Processed Oil, Coaltar Pitch	☞	6,000 M.T./Year (Six Thousand Metric Ton Per Year)

For & on behalf of C.G. Environment Conservation Board


 Regional Officer
REGIONAL OFFICER
 Regional Office, C.G. Environment Conservation Board
 C.G. Environment Conservation Board
 New H. I.G. 9-10-11, Tatibandh,
 RAIPUR (C.G.)

Enclosure: Annexure

(I)
ANNEXURE

M/s Narmada Industries,
Location of factory :- Kh.No. 119-120, total area - 0.5 acre at Village -
Munrethi, Siltara, Phase-II, Raipur (C.G.)

Vide consent No.2444 /RO/ Raipur / NP/ TS /CECB/2011, Dt. 05.03.2011

A. GENERAL CONDITIONS: -

1. All discharges authorized shall be consistent with terms and conditions of this Consent facility expansions, production, increases or process Modifications which result in new or increased discharges of pollutants must be reported by submission of a new Consent, application or if such new, or increased discharge does not violate the effluent limitations specified in the Consent, by submission to the Board details of such new or increased discharges of pollutants in which case the consent may be modified to specify effluent limitations for any pollutants not identified and limited here in the discharge of any pollutant more frequently than or at a level in excess of that identified and authorized by the Consent shall constitute a violation of the terms and conditions of the Consent.
2. After notice and opportunity for the hearing, this consent may be modified, suspended or revoked by the Board in whole or in part during its term for cause including, but not limited to the following: -
 - (a) Violation of any terms and conditions of this Consent.
 - (b) Obtaining this Consent by misrepresentation of failure to disclose fully al relevant facts.
 - (c) A change in any condition that requires temporary or permanent reduction or elimination of the authorized discharge.
3. Notwithstanding para (2) above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established for a toxic pollutant which is present in the discharge authorized here in and such standard or prohibition is more stringent than any limitation upon such pollutant in this Consent the Consent shall be revised or modified in accordance with the toxic effluent standard or prohibition that the Board may consider and the applicant shall be so notified.
4. The applicant shall allow the staff of Chhattisgarh Environment Conservation Board and/or their authorized representative, upon the Presentation or credentials:
 - (a) To enter upon the applicant's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this Consent. *abe*

5

- (b) To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this Consent.
 - (c) To inspect at reasonable times any monitoring equipment or monitoring method required in this Consent; or
 - (d) To sample at reasonable times any discharge or pollutants.
5. The Application shall at all times maintain in goods working order and operate as efficiently as possible all treatment or control facilities of system installed or used by him to achieve compliance with the terms and conditions of this Consent.
 6. The issuance of this Consent does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorized any injury to private property or any invasion of personal rights, nor any infringement of Central, State or local laws or regulation.
 7. The Consent does not authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any watercourse.
 8. The specific effluent limitations and other pollution controls applicable to the discharge permitted here in are set forth below specific conditions. Also sets forth below are self-monitoring and reporting requirements. Unless otherwise specified, the applicant shall submit duplicate original copies of all reports to the Chhattisgarh Environment Conservation Board. Except for date determined to be confidential all such reports shall be available for public inspection at the office of the Chhattisgarh Environment Conservation Board. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provide for in section 42 of the Act.

B. SPECIAL CONDITIONS: -

1. Initial Effluent limitation during the period beginning on the effective date of this consent and lasting until **One Calendar Year** discharge from outfalls shall be limited and monitored by the applicant as specified below: -

- (a) The following shall be limited by the applicant as specified.

S.No.	Effluent Characteristics	Discharge Limitation				Monitoring Requirements	
		Average		Maximum		Frequency of Measurement*	Type of Sample†
		Mg/l	Kg/Day	Mg/l	Kg/Day		

* Daily/Weekly/Monthly/Tri-monthly.

† Grab/24 Hours Composite

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In Addition to above discharge shall be limited and monitored as specified below:

S.No.	Effluent Characteristics	Discharge Limitation				Monitoring Requirements	
		Average		Maximum		Frequency of Measurement*	Type of Sample†
		Mg/l	Kg/Day	Mg/l	Kg/Day		

* Daily/Weekly/Monthly/Tri-monthly.

† Grab/24 Hours Composite

For the purpose of this sub-section, the daily average discharge is the total discharge by weight during the calendar month divided by the number of days in month the production or commercial facility was operating for the purpose of the sub-section the daily maximum discharge means the total discharge by weight during any calendar day.

(b) The PH shall not be less than 5.5 or greater than 9.0

2. Final effluent Limitation: - During the period beginning 1st day of the month of commissioning of the industry and lasting until the date of expiration of this Consent, discharge from the outfalls shall be limited and monitored by the applicant as specified below:-

(a) The following shall be limited and monitored by the applicant as specified.

S.No.	Effluent Characteristics	Discharge Limitation				Monitoring Requirements	
		Average		Maximum		Frequency of Measurement*	Type of Sample†
		Mg/l	Kg/Day	Mg/l	Kg/Day		
1	B.O.D.	--	--	30	0.03	Monthly	24 hours Composite
2	C.O.D.	--	--	250	0.25		
3	S.S.	--	--	100	0.10		
	pH 5.5 to 9.0 Flow : 1.0 m ³ /day					Daily	Grab

* Daily/Weekly/Monthly/Tri-monthly.

† Grab/24 Hours Composite

Additionally, outfalls shall be monitored as follows:

- (i) Flow, Temperature and Total solids: One per Month
- (ii) Grab Samples Maximum discharge temperature above upstream receiving water shall be in accordance with the standard of ISI at 40⁰ C.
- (iii) Uniform as per ISI at 40⁰ C.

The temperature shall be monitored once per month on each outfall. For the purpose of the sub-section the daily average is the total discharge by

weight during calendar month divided by the number of days in month that the production or commercial facility was operating for the purpose of this sub-section, the daily maximum discharge means the total discharge by weight during any calendar day.

(b) The pH shall not be less than 5.5 or greater than 9.0 for outfalls. The samples are taken as monthly, grab samples.

3. Schedule of Compliance for effluent Limitation: - The applicant shall achieve compliance with the effluent limitation: specified above for discharge from outfalls in accordance with the following schedule:

(i) Report of Progress	:	Monthly
(ii) Completion of final plans by	:	
(iii) Award of contract of other commitment of financing	:	
(iv) Commencement of construction by	:	
(v) Report of construction progress	:	
(vi) Completion of construction by	:	
(vii) Attainment of operational level by	:	

Please see on page No. 13

(a) The applicant shall submit to the Consent issuing Authority the required report of progress or where a specific action is required in (a) above to be taken by a certain date a written notice of compliance or non-compliance with each of the above scheduled dates, post marked not later than 14 days following each elapsed date. Each notice of compliance shall include the following: -

- (1) A short description of the non-compliance.
- (2) A description of any action taken or proposed by the applicant to comply with the elapsed scheduled requirement without further delay.
- (3) An estimate of any factors which tend to explain or mitigate the non-compliance, and
- (4) An estimate of the date, the applicant will comply with the elapsed scheduled requirement and assessment of the possibility that the applicant will meet the next scheduled requirement time.

4. Compilation of monitoring Date

(a) Samples and measurements taken to meet the monitoring requirements specified above shall be representative of the volume and nature of monitored discharge.

(b) Following promulgation of guidelines establishing test procedures for the analysis of pollutants, all sampling and analytical methods used to the meet monitoring requirements specified above shall conform to such guidelines. Unless otherwise specified sampling and analytical methods shall conform to the latest edition of the Indian Standard specifications and here it is not specified the guidelines as per standard methods for the,

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examination of Water & Waste Waters 13th Edition of the American Public Health Association, New York U.S.A. shall be used.

- (c) The applicant shall take samples and measurement to meet the monthly requirements specified above at the location indicated below:

POINT OF SAMPLING

- (i) Outfalls of waste.
 - (ii) 100 meters from point to confluence, down stream to river or lake.
5. Recording of Monitoring activities and Results:
- (a) The applicant shall make and maintain records of all information resulting from monitoring activities by this Consent.
 - (b) The applicant shall record for each measurement of sample take pursuant to the requirements of this Consent that following information:
 - (1) The date exact place and time of sampling
 - (2) The dates on which analysis were performed.
 - (3) Who performed the analysis.
 - (4) The analytical techniques of methods use and
 - (5) The result of all required analysis.
 - (c) If applicant monitors any pollutant more frequently as is required as is by this Consent he shall include the results of such monitoring in the calculation and reporting of values required in the discharge monitoring reports, which may be prescribed by the Board, such increased frequency shall be indicated on the Discharge Monitoring Report from.
 - (d) The applicant shall retain for a minimum of 3 years all records of monitoring activities and result including all records of calibration and maintenance of instrumentation and original strip chart regarding continuous monitoring instrumentation. The period or retention shall be extant during the course of any unresolved litigation regarding the discharge of pollutants by the applicant or when requested by the Central or State Board.
6. Reporting of Monitoring Results:
- (a) Monitoring information required by this Consent shall be summarized and reported by submitting a Discharge Monitoring Report form duly filled in and signed, to the Board's office at the following address: **Chhattisgarh Environment Conservation Board, New H.I.G. 9-10-11, Tatibandh, Raipur(C.G.).**
 - (b) Each submitted Discharge Monitoring Report shall be signed as follows:

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- (i) If submitted by Corporation by a Principal Executive Officer of at least the level of Vice-President or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the discharge Monitoring Report originates,
 - (ii) If submitted by a partnership by a general partner.
 - (iii) If submitted by a sole proprietor, the proprietor,
 - (iv) If submitted by a Municipal, State or Central Government or other public enterprises, by a Principal Executive Officer, ranking elected official commanding officer, or other duly authorized employee.
- (c) All information submitted on the Discharge Monitoring Form shall be based upon measurements and sampling carried out during the three previous calendar months. The first Discharge Monitoring Report shall be submitted for a period ending 60 days from issuance. Thereafter reporting period shall end on the last date of each month. The applicant shall submit a Discharge Monitoring Report post marked no later than 28th day of the month following each completed reporting period.
7. Limitation of Discharge of Oil Hazardous Substance in harmful quantities: The applicant shall not discharge oil in quantities defined as harmful in regulations. In addition the applicant shall not discharge hazardous substance into natural watercourse in quantities defined as harmful in regulations promulgated by the Board. Nothing in this Consent shall be deemed to preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities, or penalties to which the applicant is or may be subject to clauses.
8. Limitation of visible Floating Solids and Foam: During the period beginning date of issuance and lasting until the date of expiration of this Consent the applicant shall not discharge floating solids or visible foam.
9. Disposal of Collected Solids:
- (a) Intake Water Treatment: Solids Sludge, dirt, silt or other pollutant separated from or resulting from treatment of intake or supply waters period to use by the applicant shall be disposed of in such a manner as to prevent any pollutant from such materials from entering any such water. Any live fish, shell fish or other animals collected or trapped as a result of intake water screening or treatment may be returned to water shall be disposed of in such a manner as to prevent any pollutants from such materials from entering natural water,
 - (b) Waste water Treatment, Solids sludge, filter, backwash of other pollutant removed from or resulting from treatment or control of waste waters

shall be disposed of in such a manner as to prevent any pollutants from such materials from entering natural water.

10. Non-compliance with Effluent Limitations:

- (A) If for any reason the applicant does not comply with or will be unable to comply with or will be unable to comply with any daily maximum effluent limitations specified in this Consent the applicant shall immediately notify the Consent issuing authority or his designee by telephone No. 2573897 and provide the Consent issuing Authority with the following information in writing within 5 days of such notification:
 - (a) Cause of non-compliance
 - (b) A description of the non-complying discharge including its impact upon the receiving water.
 - (c) Anticipated the time condition of non-compliance is expected to continue or if such condition has been corrected, the duration of non-compliance.
 - (d) Steps taken by the applicant to reduce and eliminate the non-complying discharge and;
 - (e) Steps to be taken by the applicant to prevent recurrence of conditions of not compliance.
- (B) The applicant shall take all responsible steps to minimize any adverse impact to natural waters resulting from non-compliance with any effluent limitation specified in this Consent including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.
- (C) Nothing in this Consent shall be constructed to relieve the applicant from civil or criminal penalties for non-compliance, whether or not such non-compliance is due to factors beyond his control such as equipment break down electric power failure, accident or natural disaster.

Limitation of Batch Discharge.

SPECIAL CONDITIONS

11. Provision for Electric Power Failure: The applicant shall either-

- (a) No later than certify in writing to the consent issuing authority that applicant has installed or provided for an alternative electric power sources sufficient to operate all facilities utilized by the applicant to maintain compliance with the terms and conditions of the Consent or.

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- (b) No later than 30 days after the effective date of his Consent, certify in writing to the consent issuing authority that upon the reduction, loss, or failure of one or more of the primary sources of electric power to any facilities utilized by he applicant to maintain compliance with the terms and conditions of his consent, the applicant shall halt, reduce or otherwise Control production and/or all discharges in order to maintain compliance with the terms conditions of this Consent.
12. Prohibition of By-pass of Treatment Facilities: The diversion or by-pass of any discharge from facility utilized by the applicant to maintain compliance with the terms and conditions of this Consent is prohibited except:
- (a) Where unavoidable to prevent loss of life severe property damage, or
- (b) Where excessive storm drainage or run of f would damage any facilities necessary for compliance with the terms and conditions of this Consent. The applicant shall immediately notify the consent issuing authorities in writing of each such diversion or by-pass in accordance with the procedure specified above for reporting non-compliance.
13. Spill Prevention and Containment Plan: Within 90 days of the effective date of the Consent the applicant shall prepare and submit to the consent issuing authority; a Spill Prevention; Containment and Countermeasure Plan for the facility covered by this Consent. Such plan shall include the following information and procedures relating to the prevention of spills and unauthorized discharges or oil and hazardous substances;
- (a) A description of a reporting system to be used to notify immediately persons responsible for management of a facility and appropriate State and Central authorities;
- (b) A description of equipment or facilities (including overall facility) for the prevention, containment of spills and unauthorized discharge;
- (c) A list of all oil and hazardous materials used processed or stored at the facility including the normal quantity maintained on the premises for each listed material;
- (d) A brief description of any spills or unauthorized discharge which occurred during the 36 months period preceding the effective date of this Consent and subsequent measures taken by the applicant or reduce the possibility or further spills or unauthorized discharges; and.
- (e) An implementation schedule for additional equipment or facilities which might be required for sub para (b) above but which are not yet operational.

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SPECIAL CONDITIONS

Additional Conditions: -

- 1 The date of commissioning of the industry shall be informed at least one month in advance.
- 2 The industry shall have to provide adequate facility for proper treatment of industrial and domestic effluent. The industry shall ensure that the treated effluent conforms to standard prescribed by the Board.
- 3 The industry shall take effective steps for full utilization of treated effluent for land use within the premises. The concept of "Zero discharge" shall be maintained all the time.
- 4 Regular monitoring report of the treated effluent shall be submitted to the Board every month.
- 5 The industry shall take effective step for extensive tree plantation in and around their premises for general improvement of environmental conditions.
- 6 Industry shall adopt good house keeping practices inside the factory premises. All the internal roads should be made pucca.
- 7 The industry shall make proper and safe arrangement for safe disposal of solid waste and sludge.
- 8 All the construction activities for establishment of industry shall be carried out exclusively using fly ash bricks/blocks and other products based on fly ash as far as possible.
- 9 The industry shall obtain Authorization under Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 (If required).
- 10 The Industry shall adopt Rain Water Harvesting system for the conservation of ground water.
- 11 The industry shall submit land diversion certificate from competent authority within a period of one month from the date of issue of this consent letter.
- 12 Industry shall obtain statutory clearances/permissions from concerned central/ state government departments, boards, bodies and corporations etc. before establishment of the unit.
- 13 The issuance of this consent does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or local laws or regulations.

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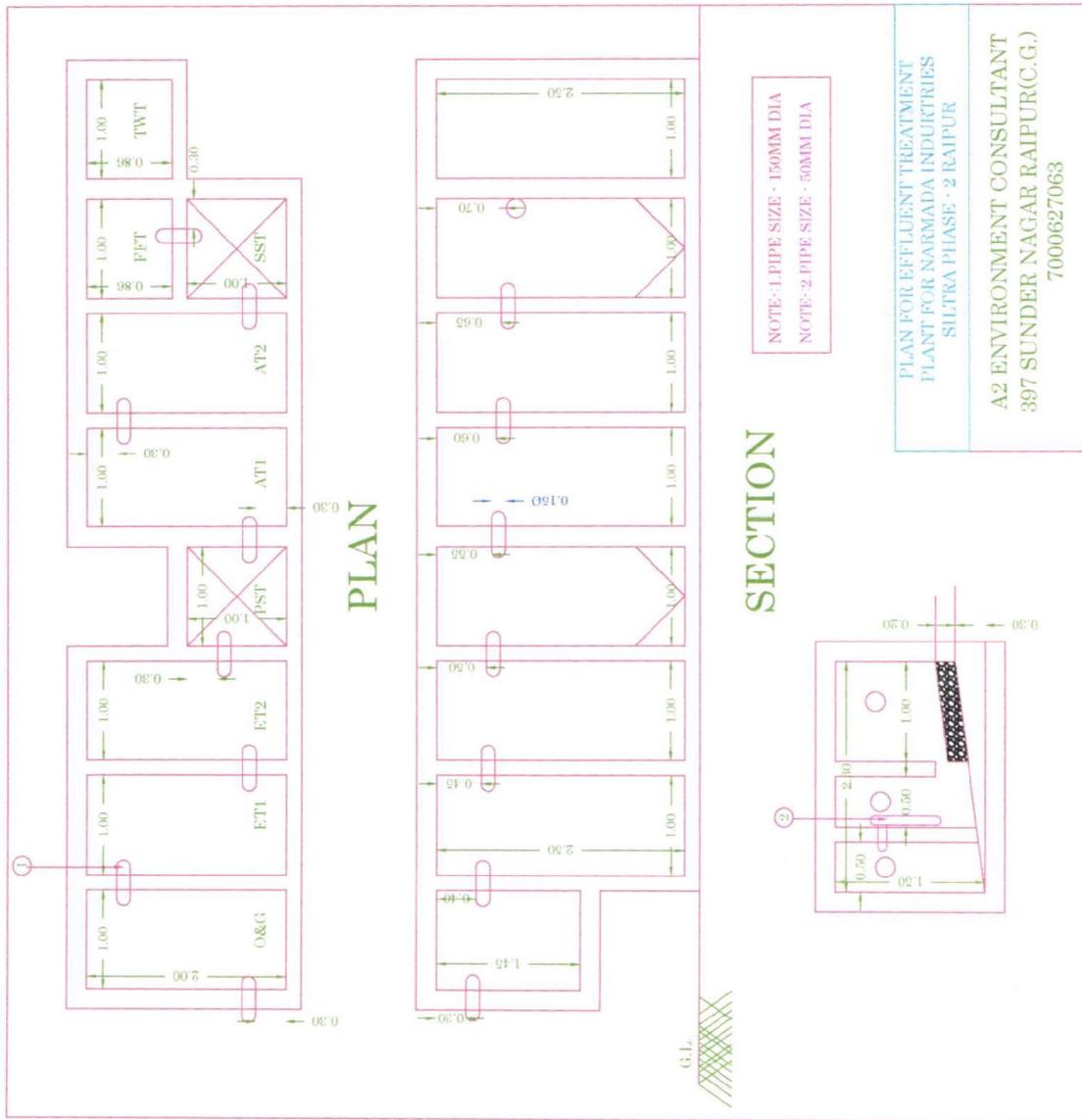
- 14 Any change in production capacity/process/raw material used etc. shall be intimated to the board for any enhancement of the above prior permission of the Board shall be obtained.
- 15 The industry shall be commissioned within the period of five years from the date of issue of this consent letter. In case the industry is not commissioned within the stipulated period the consent shall be treated as cancelled.
- 16 The Board reserves the right to amend/Cancel any of the above conditions or add new conditions as and when deemed necessary.

This consent and the authorization to discharge shall expire on midnight on the day after **12 months from the first day of the month of commissioning of the plant**. The applicant shall not discharge after the date of expiration. The applicant shall submit such information, forms and fees as required by the Board not later than 180 days prior to the above date of expiration.

By authority of Chhattisgarh Environment Conservation Board


Regional Officer
Regional Office, C.G. Environment Conservation Board
C.G. Environment Conservation Board
Raipur (C.G.)
H. P. P. U. (C.G.)

Amrinder Singh



Study Report on existing batch process unit of M/s S.G. Petrotech, Tehsil - Sampla, Dist. - Rohtak, Haryana

1. Background

In compliance with NGT order dated 06.01.2020 in the matter of OA No. 400/2019, study was carried out at M/s S.G. Petrotech, Haryana following the protocol as detailed below:

- The monitoring will be carried out at both work place as well as ambient air quality with following parameters:
 - Work Place Monitoring (to cover entire production cycle of TPO i.e. feeding of reactor, pyrolysis of rubber, cooling period and unloading of reactor i.e. removal of carbon & steel) for Respirable dust (PM₁₀, PM_{2.5}), CO, VOCs, B(a)P,
 - Ambient Air Quality Monitoring (24 hr. monitoring) for PM₁₀, PM_{2.5}, B(a)P, VOCs
- In case of batch process monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of carbon black powder & steel for comparison purpose.
- For ambient air quality, monitoring to be carried out for 24 hr. time weighted average during operation of the plant at two to four locations.
- Work Place monitoring to be carried at two to four locations and should cover entire manufacturing process of TPO i.e. i.e. feeding of reactor, pyrolysis of tyre, cooling period and unloading of reactor.
- Detailed analysis of tyre pyrolysis oil (as per schedule V Part B of Hazardous & other waste (M&TM) Rules 2016) in terms of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content.
- Detailed compositional Analysis of TPO w.r.t Carbon Number, specific gravity/density, Acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson carbon residue), Ash content, Pour Point, PONA (Paraffin, Olefins, Naphtha, Aromatics)
- Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analysed.
- Locations and numbers of sensors/alarms.
- Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire (draft questionnaire attached)
- Health assessment of workers through questionnaire.
- Any other parameter of interest if found to be useful during the study may also be included.

Accordingly monitoring was carried out during August 04, 2021 to August 06, 2021 by CPCB's team lead by Shri Tarun Darbari, Scientist 'D' at the aforesaid unit M/s S.G. Petrotech located at Khewat No. 305, Ismaila 11-B, Ismaila Road, Tehsil Sampla, Rohtak, Haryana 124501 and sampling was carried out through a laboratory- M/s Fare Labs Private Limited recognized under the Environment (Protection) Act, 1986. Mr. Arun Chaturvedi, Manager (Environment Air Section) represented as team leader from the laboratory side during the sampling. Smt. Meetu Puri, Scientist 'B', CPCB and Shri Ravinder Yadav, AEE from Haryana Board were present during study.

2. About the Industry – location, plant & machineries

M/s S.G. Petrotech. is located at Khewat No. 305, Ismaila 11-B, Ismaila Road, Tehsil Sampla, Rohtak, Haryana 124501. The Unit has total land area of 5700 sq. meter with total buildup area of 2000 sq. meter. The unit is carrying out production of Tyre Pyrolysis Oil (TPO) using existing batch process. The unit has installed five (5) numbers of reactors of capacity 10 MT each. Out of five (5) reactors, four (4) reactors have diameter of 2.7 meter and one reactor has diameter of 2.8

meter. Length of all the five (5) reactors is 6.1 meter. The Reactors operates in shifts so that only one reactor uses natural gas for initial firing and heating. The reactors are covered with canopy. Front, back and bottom sides of reactor is without canopy. The canopy is connected with scrubber and stack for emission of flue gases. There were two (2) wet scrubbers followed by a stack of thirty (30) meters height. The reactor has spiral arrangement, which helps in unloading of carbon black. For removal of carbon black, the reactor is moved slowly in counter clockwise direction resulting into unloading of carbon black in the carbon storage rooms built underground below the reactor through a chute. The chute of the reactor is opened manually through a door provided in the canopy. Once the first reactor starts generating pyro gas, the same is used for heating the reactor itself and for initiating firing & heating of next reactor. All the reactors operate in sequential manner to optimize use of pyro gas. Generally, three (3) reactors operate on per day basis. The unit is using natural gas (LPG) for initial heating and afterwards pyro gas is recirculated for firing & heating the reactors. Every reactor is attached with four (4) condensers and to primary oil collection tank. From the collection tanks the tyre pyrolysis oil (TPO) is transferred into a common oil storage tank. The effluent generated during the process is treated in an ETP and reused.

The unit has valid CTE, CTO & Authorization under Hazardous Waste issued by Haryana Pollution Control Board. As per CTO the unit has been given consent for effluent of 2KL/day i.e. 1KL/Day for trade effluent and 1KL/Day for Domestic. As per CTE the capacity of the unit in terms of raw material is 40 Metric Tonnes /Day of scrap tyre. With regard to product, the capacity of the unit is Tyre Pyrolysis Oil (TPO) @20 KL/Day, Carbon Black@ 16MT/Day & Steel Cord @4MT/Day. Google Map showing location of the plant as below:



**Google Map showing location of M/s S.G. Petrotech
Thesil. Sampla, Dist. Rohtak, Haryana**

3. Tyre Pyrolysis Process and Environmental Status:

The study was carried out during August 4 to 6, 2021. During day one CPCB's team carried out reconnaissance survey of the unit for setting up of monitoring stations at both ambient air & work zone. The monitoring of the unit was carried out during August 05 to 06, 2021. At the time of study only one reactor was operational. During the monitoring around 8 Metric Tonne (MT) of de-beaded waste tyres were fed manually into the reactor. The process involved

- Loading of de-beaded waste tyres in the reactor
- Pyrolysis process
- Cooling Period
- Unloading of carbon black from the reactor
- Unloading of steel scrap

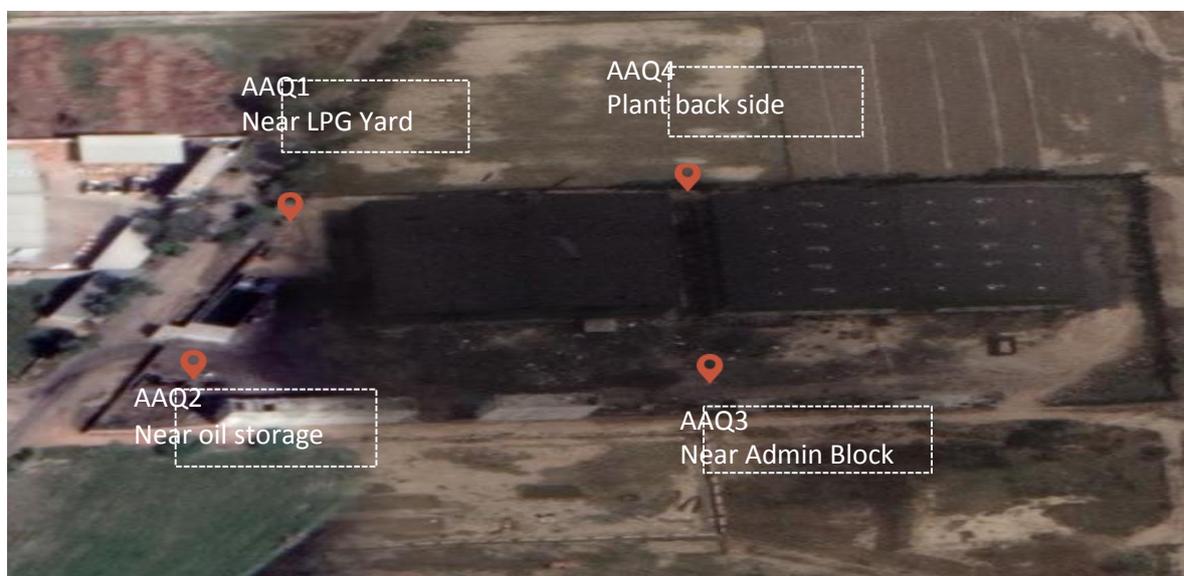
One complete cycle of TPO production took twenty six (26) hrs approximately. The Scrap Tyres were de-beaded and packed densely manually into the reactor chamber. The reactor is then heated to 250°C – 380°C. Initially natural gas (LPG) is used for firing and starting of operation. After starting of process, the generated pyro gas is condensed and oil is recovered. The uncondensed pyro gas is further re-circulated for firing, after cut off of oil firing. The reactor is rotated slowly 0.5 to 2 RPM during the process. The condensed oil collected in the oil storage tanks connected to the individual condensers and stored in the final collection tank. The uncondensed pyro gas is recirculated for firing the reactor. The flue gas from the firing chamber is passed through scrubber followed by the stack. A pipe of thirty (30) meters has been provided for flaring of excess pyro gas. The flaring pipe is placed along the stack for flue gas.

Various activities during tyre Waste pyrolysis and reading of Temperature and Pressures

Date	Time	Temperature °C	Pressure kg/cm ²	Activities
		Primary tank	Primary tank	
05.08.2021	11:45 AM to 2:45 PM			Tyre feeding to the reactor
	2:45 PM	168	0.01	Heating of the Reactor started by switching on the Burners
	3:34 PM	188	0.01	
	4:45 PM	228	0.01	
	5:45 PM	263	0.01	
	6:45 PM	280	0.02	
	7:45 PM	376	0.03	
	8:45 PM	380	0.04	
	9:45 PM	328	0.03	
	10:45 PM	200	0.02	
	11:45 PM	185	0.01	
06.08.2021	12:45 AM	170	0.01	Cooling of the Pyrolysis Reactor started by switching off the Burners
	1:45 AM	163	0.01	
	2:45 AM	150	0.01	
	3:45 AM	139	0.01	
	4:45 AM	127	0.01	
	5:45 AM	121	0.00	
	6:45 AM	116	0.00	
	7:45 AM	112	0.00	
	8:45 AM	108	0.00	Carbon unloading Process
	9:45 AM	102	0.00	
	10:45 AM	98	0.00	
11:45 AM	96	0.00	Opening of Reactor Gate and Steel Scarp unloading from the Reactor	
12:45 PM	91	0.00		
1:45 PM	80	0.00		

a. Ambient Air Quality Monitoring

The ambient air quality monitoring was carried out in four (04) locations by taking into considerations the predominant wind direction of the area (AAQ1 to AAQ4). The monitoring was carried out for PM₁₀, PM_{2.5}, VOCs & B (a) P using Respirable Dust Sampler (Envirotech, FLE No-709), Fine Particulate Sampler (Envirotech, FLE No-713), OVS Sampler (FLE-721). The air quality was monitored as 24 hourly average monitoring values. Google map showing location of monitoring stations is given below:



Ambient Air Quality Monitoring Stations (AAQMS)

Ambient Air Quality Monitoring Results:

S. No.	Parameters	AAQ1	AAQ2	AAQ3	AAQ4	NAAQS	Protocol Followed
1	Particulate Matter (PM _{2.5}), µg/m ³	58.04	53.9	58.61	104.72	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	124.21	113.64	96.57	173.66	100	IS-5182(P-23)
3	Benzene, µg/m ³	7.27	5.88	8.11	13.56	5 (Annual Std.)	FL/SOP/GC-46
4	Toluene, µg/m ³	24.68	11.13	68.19	24.92	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	0.98	7.86	72.37	49.95	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	1.45	2.24	79.83	45.80	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	2.88	ND,[DL-0.02]	ND,[DL-0.02]	ND,[DL-0.02]	NA	FL/SOP/GC-46
8	Benzo (a) Pyrene, ng/m ³	ND,[DL-0.5]	ND,[DL-0.5]	ND,[DL-0.5]	ND,[DL-0.5]	1(Annual Std.)	Method of Air-Sampling & Analysis (102)

- The levels of PM₁₀ were exceeding the prescribed standards at three out of four locations. The highest values were observed at AAQ4. This location was at the backside of the plant and was closest to the pyrolysis operation. The PM₁₀ levels were in the range of 96.57 to 173.66 µg/m³
- The levels of PM_{2.5} were exceeding the limits at only one location i.e. AAQ4 which was closest to the pyrolysis operation. The PM_{2.5} levels were in the range of 53.9 to 104.72 µg/m³
- VOCs have been analyzed in the terms of BTX i.e. Benzene, Toluene & Xylene
- The levels of Benzene appears to be on higher side at all the location. The highest levels were observed at AAQ4. The benzene levels were in the range of 5.88 µg/m³ to 13.56 µg/m³. These are 24 hour values where as standard is annual average.

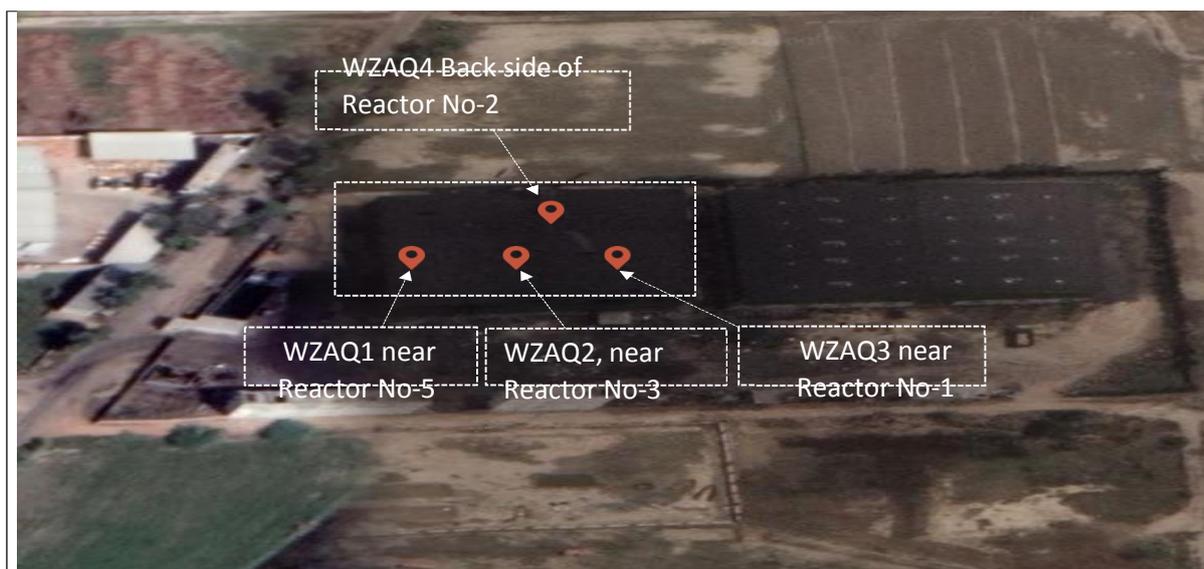
- The levels of B (a) P at all the monitoring locations to be on lower side. These are 24 hour values where as standard is annual average.
- Detailed analysis results are enclosed

PHOTOGRAPHS OF AMBIENT AIR QUALITY MONITORING STATIONS



b. Work Zone Monitoring

The work zone monitoring was carried out as per the protocol w.r.t PM₁₀, PM_{2.5}, CO, VOCs & B (a) P. The work place monitoring was carried out at four locations inside the work place where 5 reactors were installed (WZAQ1 to WZAQ4). The first location was setup at the entry of work place. Second was in the center of the work place. Third was close to the opening of reactor which was functional at the time of study while fourth station was at the backside of the reactors. The monitoring was carried out to cover the entire production process i.e. from loading of tyres in the reactors to unloading of carbon black and steel wire removal. The monitoring was carried out using Fine Particulate Sampler (Envirotech, FLE No-717 & 697),CO Analyzer(Ecotech FLE-149) OVS Sampler



Showing Work Place Air Quality Monitoring Stations (WZAQMS)

Work Zone Monitoring Results

S. No.	Parameters	WZAQ1	WZAQ2	WZAQ3	WZAQ4	OSHA 3430-04:2011 Standards	Indian Factory Act 1948	Test Method
1.	Particulate matter (PM _{2.5}), µg/m ³	95.54	196.9	241.47	208.24	NA	NA	FL/SOP/ENV-19
2.	Particulate matter (PM ₁₀), µg/m ³	166.4	237.21	291.08	261.94	NA	NA	FL/SOP/ENV-19
3.	Benzene, ppm	2.88	4.23	16.82	3.28	1	10	FL/SOP/GC-46
4.	Toluene, ppm	36.74	53.12	286.98	68.99	200	100	FL/SOP/GC-46
5.	Xylene (p, o, m), ppm	167.73	197.33	421.51	191.29	100	100	FL/SOP/GC-46
6.	Benzo (a) Pyrene, mg/m ³	0.098	0.92	1.14	0.96	0.2	NA	NIOSH Method 5506
7.	Carbon Monoxide (as CO), mg/m ³	10.82	13.58	26.10	9.18	50	40	FL/SOP/GC-25

- The levels of PM_{2.5} were in the range of 95.54 µg/m³ to 241.47 µg/m³. The highest levels were observed in the station WZAQ3 which was closed to opening of reactor.
- The levels of PM₁₀ were in the range of 166.4 µg/m³ to 291.08 µg/m³. The highest levels were observed at WZAQ3.
- Monitoring of VOCs was done w.r.t BTX i.e Benzene, Toluene & Xylene. The levels of Benzene were exceeding the permissible exposure limit (PEL) of OSHA at all locations and within Indian Factory Act Standard 1948 at three monitoring locations and exceeding at location at WZAQ 3 (16.82 ppm) i.e close to operational reactor.
- The levels of Toluene were exceeding the PEL of OSHA and Indian Factory Act Standard 1948 at one location i.e. WZAQ3.
- The levels of Xylene were exceeding the PEL of OSHA and Indian Factory Act Standard 1948 at all monitoring locations. The highest levels were observed at WZAQ3.
- The levels of B(a)P were exceeding the PEL of OSHA at three out of four locations and were again highest at WZAQ3. The range of monitored B(a) P was 0.92 to 1.14 mg/m³
- The levels of CO were within the prescribed limits but higher values were observed at WZAQ3.
- The levels of pollutants were lowest at WZAQ1 i.e entry point of the work zone
- Detailed analysis results are enclosed

PHOTOGRAPHS OF WORK ZONE AIR QUALITY MONITORING STATIONS



WZAQ1 (Near Reactor No.5)



WZPAQ3 (Near Reactor No.1)



WZAQ2 (Near Reactor No.3)



WZAQ4 (Back side of Reactor No.2)

c. Analysis of Tyre Pyrolysis Oil

The detailed analysis of Tyre Pyrolysis was done as follows:

- **Detailed analysis of tyre pyrolysis oil** (as per schedule V part B of HoWM rules 2016). in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content .

- **Detailed compositional Analysis of TPO** w.r.t Carbon Number, specific gravity/density, Acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson carbon residue), Ash content, Pour Point, PONA (Paraffin, Olefins, Naphtha, Aromatics) .
- During the study, the analysis of tyre pyrolysis oil (TPO) was also carried out. There is no specific standard prescribed for oil derived from waste/scrap tyres. So the TPO was compared with the parameters specified for fuel derived from the waste oil as notified in Hazardous and Other Waste (Management and transboundary) Rules, 2016 Schedule – V Part – B. The analysis of the TPO reveals that value of parameters are well within the limits prescribed for fuel derived from waste oil under schedule V part B of HoWM rules 2016.
- TPO appears to be better than furnace oil and its calorific value comes at 9120 Kcal/Kg

Analysis result of Tyre Pyrolysis Oil

S. No.	Parameter	Test Result	Maximum Permissible limits	Protocol
1	Density, Kg/L	0.926	NS	IS-1448:P-16
2	Kinematic Viscosity @ 40°C , cSt	6.12	NS	IS-1448:P-25
3	Flash Point, °C	52	NS	IS-1448:P-21
4	Sulphur Content, % wt.	0.87	4.5	IS-1448:P-33
5	Conradson Carbon Residue (10% residue), % wt.	0.62	NS	IS-1448:P-122
6	Water Content, % wt.	0.02	1	ISO-12937
7	Total Halogens, ppm	287.4	4000	USEPA Method-9076
8	Carbon Number	C ₄ -C ₂₂	NS	FL/SOP/GC-97
9	Acidity on Burning Tip, mgKOH/g	0.167	NS	ISO 6618
10	Boiling Range, °C	72 to 295	NS	IS-1448: P-18
11	Ash Content, % wt.	0.087	NS	IS-1448: P-4
12	Pour Point, °C	-6	NS	IS-1448:P-10
13	PONA (Paraffin, Olefins, Naphtha, Aromatics), % volume	70.87	NS	FL/SOP/GC-98
14	Calorific Value, Kcal/kg	9120	NS	IS-1448:P-6
15	Sediments, % wt.	0.002	0.25	IS-1448:P-30
16	Lead, ppm	ND, [LOQ-0.3]	100	USEPA Method-3031
17	Cadmium, ppm	ND, [LOQ-0.3]	500	USEPA Method-3031
18	Chromium, ppm	ND, [LOQ-0.3]		USEPA Method-3031
19	Nickel, ppm	ND, [LOQ-0.3]		USEPA Method-3031
20	Arsenic, ppm	ND, [LOQ-0.3]	5	USEPA Method-3031
21	Polyaromatic Hydrocarbons (PAHs), % wt.	0.11	6	FL/SOP/HPLCP-31
22	Polychlorinated biphenyls (PCBs), ppm	BLQ , [LOQ-0.01]	2	FL/SOP/GCMS/P-04

d. Status of Environmental Concerns:

➤ **Spillage and Fugitive emission of black carbon in the working area:**

At the end of pyrolysis process, the carbon black powder was unloaded into a storage room built underground below the reactor. The unloading started when the temperature of primary tank was 108°C (No arrangement for measuring temperature on the Reactor) that is at a higher temperature and without nitrogen purging. From the Carbon black storage room, the carbon black powder is filled manually into the bags for further use. Leakages and fugitive emissions observed during unloading of carbon black powder, as the reactor door and storage room did not have proper sealing. Fugitive emissions were also observed during unloading of steel wire scrap.

Concern of spillage of black carbon powder and fugitive emission was not addressed which results in exposure of workers to fine carbon particle. Reactors do not have temperature meters. No programme logic controller (PLC) arrangement was found in the unit.

➤ **Escape of pyro gas**

The reactor gate was opened without nitrogen purging when the temperature of primary tank was 108°C this may lead to escaping of pyro gas into the environment.

Arrangement for nitrogen purging, installation of temperature gauge and gas sensor for Carbon monoxide (CO) and methane (CH₄) have to be made.

➤ **Flaring of excess Pyro gas**

The unit has arrangement for utilization of pyro gas generated from the pyrolysis operation at first reactor for self-heating and for initial firing and heating of other reactors in a sequential manner. Provision for flaring of excess pyro gas has been made through a pipe along with stack at the height of 30 m and also during emergencies.

There is no arrangement of bypassing the pyro gas has been made in case of choking or blockage of vents inside the reactor during pyrolysis operation. Arrangement of differential pressure gauge and alarm system (hooter) have to be made.

➤ **Removal of Steel Scrap**

The steel scrap is removed using the crane and stored in the open storage yard. Removal of steel scrap from the reactor generates fugitive emission and exposes workers to fine carbon particle.

Arrangement for minimizing fugitive emission during removal of steel scrap like sprinkling of water and suction hood over the door of the reactor be made. To avoid spillage of deposited carbon particle, a suitable tray with wheel to be used.

➤ **Waste Water treatment:**

The process waste water generated from scrubbers and condensers is being treated in an ETP. After treatment of the waste water the same was reused.

➤ **Odor problem in plant and in neighborhood;**

During study odor was observed in the scale of four (4), if measured in the scale of 1-10. As per the questionnaire survey carried out among nearby villagers it was informed that no problem of odor or dust issue found due to operation of this unit.

➤ **Exposure of workers to fine carbon particles;**

Workers are provided proper Personnel Protective Equipment such as mask, gloves, and boots. However, chances of exposure to fine carbon is there during unloading of carbon black and steel scrap.

- **Spillage and floor washing containing charcoal particle and oil;**
The unit has informed that mechanical/manual cleaning being carried out for removal of carbon particles. The unit has provided closed loop system for oil, so that chances of oil spillage is reduced. The water from floor cleaning is also treated in the ETP.
- **Storage of raw material**
The waste tyres were kept in an open area on the unpaved ground.
- **Roads & Floors in the unit**
The open area of the plant was not cemented and was totally muddy due to rainfall at the time of study. The work zone had concrete flooring. While there were no pukka roads within the unit
- **Scrubber and Stack for flue gas emission**
For controlling emissions from combustion of fuel used for firing and heating of the reactor, the unit has installed two wet scrubbers along with a stack of 30m height.

e. Health Survey

Surveys to assess health & odor issues was carried out. through questionnaire. Survey of residents around 1km of the unit could not be carried out as there was no residential area close to the unit. The survey of workers of the unit was carried out through questionnaire & they have not reported any health related problem .

4. Observation and recommendation for Improvement

Observations:

- i. During monitoring and sampling, the officials observed fugitive emission and odor. The odor value can be scaled as 4 in the scale of 1 to 10.
- ii. Fugitive emissions observed during unloading of carbon black and steel scrap.
- iii. The levels of PM₁₀ were exceeding the prescribed limit for ambient air at three locations.
- iv. The levels of PM_{2.5} were exceeding the prescribed limit for ambient air at one location
- v. The levels of benzene were on higher side in the ambient air but cannot be compared with prescribed limit, which is an annual limit and in the present case the monitoring were carried out only for 24 hours.

In the work zone there is no limit prescribed for PM₁₀ and PM_{2.5} under Air Act, 1981 or under E (P) Act 1986. In the factory act 1948, limit for BTX has been provided.
- vi. In the work zone the limit of BTX measured in 24 hr. TWA where as the permissible exposure limit is based on 8hr TWA under factory act of 1948. So as of now comparison has not been made. However values are on higher side.
- vii. The tyre pyrolysis oil (TPO) have a calorific value of above 9000 Kcal/kg.
- viii. Compared with the limits prescribed for fuel oil derived from waste oil, the values for TPO is well within the limits.
- ix. **Carbon number of TPO appears to be from C₄ to C₂₂. The flash point is 52°C and the Sulphur content is 0.87 % and boiling range is 72 to 295.**

Recommendations:

- i. Suction hood of sufficient capacity connected to air pollution control devices (APCDs) needs to be provided over the reactor gate and bagging area for reduction fugitive emissions.
- ii. The entire pyrolysis operation be carried out through programme logic controller (PLC) with adequate number of pressure and temperature gauge and with safety valves and bypass arrangements.
- iii. Adequate number of gas sensors (Methane, carbon mono oxides and VOCs) along with alarm system (hooter) be installed within the work zone.
- iv. A bypass system for bypassing pyro gas in case of blocking/choking of vent within the reactor be installed and to be connected with primary tank and flaring system.
- v. Carbon black has to be removed and bagged mechanically without any spillage and fugitive emission. Arrangement for preventing spillage and fugitive emission during unloading of carbon black be made.
- vi. Arrangement of suitable trays with wheels for transporting the steel scrap within the premise from generation points to storage points to be made to avoid spillage of carbon particle attached with steel scrap.
- vii. Waste tyre be kept in a shaded area on paved surface.
- viii. Firefighting equipment be installed in adequate number.

Meetu Puri

(Meetu Puri)
Scientist "B", WM-III Div.

Tarun Darbari

(Tarun Darbari)
Scientist "D" WM-III Div.

Enclosures

AMBIENT AIR QUALITY MONITORING AT AAQ1

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 03:00 PM to 03:10 PM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: M/s S G Petrotec, Sampla Beri Road, Village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: AAQ – 001(Near LPG Gas storage Area)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.15
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 28.770661, E 76.72316
Ambient Temperature (°C)	: 31
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-709)

∩ Analysis Report

S. No	Parameters	Test Result	NAAQS	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	58.04	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	124.21	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	7.27	5	FL/SOP/GC-46
4	Toluene, µg/m ³	24.68	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	0.98	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	1.45	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	2.88	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND,[DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)

***NAAQS** - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Do Not Conform**s to NAAQS 2009 Except for **PM_{2.5}** value.

AMBIENT AIR QUALITY MONITORING AT AAQ2

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 02:20 PM to 02:20 PM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: M/s S G Petrotec, Sampla Beri Road, village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: AAQ – 002 (Near Oil storage tank)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.18
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N28.770612, E76.72308
Ambient Temperature (°C)	: 31
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.

Analysis Report

S. No.	Parameters	Test Result	NAAQS*	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	53.9	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	113.64	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	5.88	5	FL/SOP/GC-46
4	Toluene, µg/m ³	11.13	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	7.86	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	2.24	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND,[DL-0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND,[DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Do Not conforms** to NAAQS 2009 Except for **PM_{2.5}** value.

AMBIENT AIR QUALITY MONITORING AT AAQ3

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 02:25 PM & 02:25 PM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: M/s S G Petrotec, Sampla Beri Road, village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: AAQ – 003 (Near Admin block)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.13
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 28.770628, E 76.72345
Ambient Temperature (°C)	: 31
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-703) Fine Particulate Sampler (Envirotech, FLE

Analysis Report

S. No.	Parameters	Test Result	NAAQS*	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	58.61	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	96.57	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	8.11	5	FL/SOP/GC-46
4	Toluene, µg/m ³	68.19	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	72.37	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	79.83	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND, [DL- 0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND, [DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Do Not conforms** to NAAQS 2009 Except for **PM₁₀** & **PM_{2.5}** values.

AMBIENT AIR QUALITY MONITORING AT AAQ4

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 02:30 PM & 02:30 PM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: M/s S G Petrotec, Sampla Beri Road, village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: AAQ-04 (Back Side of Plant Area)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.12
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 28.770653, E 76.72316
Ambient Temperature (°C)	: 31
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-694) Fine Particulate Sampler (Envirotech, FLE No-716), OVS Sampler (Envirotech FLE-724)

Analysis Report

S. No	Parameters	Test Result	NAAQS	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	104.72	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	173.66	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	13.56	5	FL/SOP/GC-46
4	Toluene, µg/m ³	24.92	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	49.95	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	45.80	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND,[DL- 0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND,[DL-0.5]	1	Method of Air- Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)

***NAAQS** - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Do Not Conform** to NAAQS 2009.

WORK PLACE AIR QUALITY MONITORING AT WPAQ1

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 11:45 AM to 11:45 AM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: M/s S G Petrotec, Sampla Beri Road, Village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: WPAQ- 001(Near Reactor No.005)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.75
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 28.770698, E 76.72385

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	95.54	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	166.4	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	2.88	1	10	FL/SOP/GC-46
4	Toluene, ppm	36.74	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	78.19	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	89.54	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	0.098	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	10.82	50	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

WORK PLACE AIR QUALITY MONITORING AT WPAQ2

Sample Particulars:

Nature of the Sample : **Work Place Air**
Date of Sampling : 05/08/2021 to 06/08/2021
Time of Sampling : 11:47 AM to 11:47 AM
Test Started On : 06/08/2021
Test Completed On : 11/08/2021
Purpose of Monitoring : To Check Pollution Load
Method of Sampling : IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location : M/s S G Petrotec, Sampla Beri Road, Village Ismaila
11-B, Tehsil Sampla, District Rohtak
Sampling Location : WPAQ- 002 (Near Reactor No.003)
Avg. Flow Rate of Air RSPM/SPM (lpm) : 16.7
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC) : 1
Longitude & Latitude : N 28.770618, E 76.72381
Temperature (°C) : 36
Equipment Used Details : Fine Particulate Sampler (Envirotech, FLE
No-696 & 698), CO Analyzer, OVS Sampler

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430- 04:2011 Standards*	Indian Factory Act 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	196.9	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	237.21	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	4.23	1	10	FL/SOP/GC-46
4	Toluene, ppm	53.12	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	89.10	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	108.23	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL- 0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	0.92	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	13.58	50	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)
FL/SOP/GC-25 based on IS 5182 (P-10)

WORK PLACE AIR QUALITY MONITORING AT WPAQ3

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 11:49 AM to 11:49 AM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: M/s S G Petrotec, Sampla Beri Road, Village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: WPAQ- 003 (Near Reactor No-001)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.7
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 28.770618, E 76.72388
Temperature (°C)	: 36
Equipment Used Details	: Fine Particulate Sampler (Envirotech, FLE No-720 & 718), CO Analyzer, OVS Sampler
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-709) Fine Particulate Sampler (Envirotech, FLE No-713), CO Analyzer, OV Sampler

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	241.47	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	291.08	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	16.82	1	10	FL/SOP/GC-46
4	Toluene, ppm	286.98	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	140.29	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	281.22	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	1.14	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	26.10	50	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

WORK PLACE AIR QUALITY MONITORING AT WPAQ4

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 05/08/2021 to 06/08/2021
Time of Sampling	: 11:52 AM to 11:52 AM
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: M/s S G Petrotec, Sampla Beri Road, Village Ismaila 11-B, Tehsil Sampla, District Rohtak
Sampling Location	: WPAQ- 004 (Back side of Reactor No.002)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.75
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 28.770610, E 76.72384
Temperature (°C)	: 36
Equipment Used Details	: Fine Particulate Sampler (Envirotech, FLE No-138 & 711), CO Analyzer, OVS Sampler

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act, 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	208.24	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	261.94	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	3.28	1	10	FL/SOP/GC-46
4	Toluene, ppm	68.99	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	92.15	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	99.14	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	0.96	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	9.18	50	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

ANALYSIS OF TYRE PYROLYSIS OIL

Sample Particulars:

Nature of the Sample	: Tyre Pyrolysis Oil
Sample Quantity & Packaging	: 4X1Litre, Tin Bottle
Test Started On	: 06/08/2021
Test Completed On	: 11/08/2021
Method of Sampling	: Random Sampling
Company Location	: M/s S G Petrotec, Sampla Beri Road, Village- Ismaila, 11-B, Tehsil Sampla, District Rohtak
Ambient Temperature (°C)	: 26

Analysis Report

S. No.	Parameter	Test Result	*Maximum Permissible limits	Protocol
1	Density, Kg/L	0.926	#NS	IS-1448:P-16
2	Kinematic Viscosity @ 40°C , cSt	6.12	NS	IS-1448:P-25
3	Flash Point, °C	52	NS	IS-1448:P-21
4	Sulphur Content, % wt.	0.87	4.5	IS-1448:P-33
5	Conradson Carbon Residue (10% residue), % wt.	0.62	NS	IS-1448:P-122
6	Water Content, % wt.	0.02	1	ISO-12937
7	Total Halogens, ppm	287.4	4000	USEPA Method-9076
8	Carbon Number	C ₄ -C ₂₂	NS	FL/SOP/GC-97
9	Acidity on Burning Tip, mgKOH/g	0.167	NS	ISO 6618
10	Boiling Range, °C	72 to 295	NS	IS-1448: P-18
11	Ash Content, % wt.	0.087	NS	IS-1448: P-4
12	Pour Point, °C	-6	NS	IS-1448:P-10
13	PONA (Paraffin, Olefins, Naphtha, Aromatics), % volume	70.87	NS	FL/SOP/GC-98
14	Calorific Value, Kcal/kg	9120	NS	IS-1448:P-6
15	Sediments, % wt.	0.002	0.25	IS-1448:P-30

PHOTOGRAPHS TAKEN AT THE TIME OF STUDY





Consent to Establish issued by HPCB



HARYANA STATE POLLUTION CONTROL BOARD
SCF No. 42 & 43, Shopping Centre, Sector-6, Huda, Bahadurgarh
Ph. 01276-243077 (O)

Website – www.hspcb.gov.in E-Mail - hspcb.pkl@sifymail.com

Telephone No. – 0172-2577870-73

No. HSPCB/Consent/ : 329805017ROHCTE3978720

Dated:18/04/2017

To

M/s : S G PETROTEC

KHEWAT NO. 305, ISMAILA 11-B, ISMAILA ROAD, TEH. SAMPLA
ROHTAK
124501

Sub. : Grant of consent to Establish to M/s S G PETROTEC

Please refer to your application received on dated 2017-03-16 in regional office Bahadurgarh.

With reference to your above application for consent to establish, M/s S G PETROTEC is here by granted consent as per following specification/Terms and conditions.

Consent Under	AIR/WATER/HWM
Period of consent	18/04/2017 - 17/04/2022
Industry Type	Recycling/Pyrolysis plant of waste pneumatic tyre/ tyre scraps
Category	ORANGE
Investment(In Lakh)	136.0
Total Land Area (Sq. meter)	5700.0
Total Builtup Area (Sq. meter)	2000.0
Quantity of effluent	
1. Trade	1.0 KL/Day
2. Domestic	1.0 KL/Day
Number of outlets	2.0
Mode of discharge	
1. Domestic	septic tank
2. Trade	reused after treatment from ETP
Domestic Effluent Parameters	
1. NA	mg/l
Trade Effluent Parameters	
1. BOD	30 mg/l
2. COD	250 mg/l
3. TSS	100 mg/l
Number of stacks	1
Height of stack	
1. Pyrolysis Reactors 6 numbers	30 METERS

Emission parameters	
1. SPM	50 mg/m ³
Capacity of boiler	
1. NA	Ton/hr
Type of Furnace	
1. RECTION VESSEL (6 NO.)	8 TON/HOUR
Type of Fuel	
1. Gas	70 KG/day
2.	150

*Regional Officer, Bahadurgarh
Haryana State Pollution Control Board,
Panchkula.*

Terms and conditions

1. The industry has declared that the quantity of effluent shall be 2 KL/Day i.e 1KL/Day for Trade Effluent, 0 KL/Day for Cooling, 1 KL/Day for Domestic and the same should not exceed .
2. The above "Consent to Establish" is valid for 60 months from the date of its issue to be extended for another one year at the discretion of the Board or till the time the unit starts its trial production whichever is earlier. The unit will have to set up the plant and obtain consent during this period.
3. The officer/official of the Board shall have the right to access and inspection of the industry in connection with the various processes and the treatment facilities being provided simultaneously with the construction of building/machinery. The effluent should conform the effluent standards as applicable
4. That necessary arrangement shall be made by the industry for the control of Air Pollution before commissioning the plant. The emitted pollutants will meet the emission and other standards as laid/will be prescribed by the Board from time to time.
5. The applicant will obtain consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under section 21/22 of the Air (Prevention & Control of Pollution) Act, 1981 as amended to-date-even before starting trial production
6. The above Consent to Establish is further subject to the conditions that the unit complies with all the laws/rules/decisions and competent directions of the Board/Government and its functionaries in all respects before commissioning of the operation and during its actual working strictly.
7. No in-process or post-process objectionable emission or the effluent will be allowed, if the scheme furnished by the unit turns out to be defective in any actual experience
8. The Electricity Department will give only temporary connection and permanent connection to the unit will be given after verifying the consent granted by the Board, both under Water Act and Air Act.
9. Unit will raise the stack height of DG Set/Boiler as per Board's norms.
10. Unit will maintain proper logbook of Water meter/sub meter before/after commissioning.

11. That in the case of an industry or any other process the activity is located in an area approved and that in case the activity is sited in an residential or institutional or commercial or agricultural area, the necessary permission for siting such industry and process in an residential or institutional or commercial or agricultural area or controlled area under Town and Country Planning laws CLU or Municipal laws has to be obtained from the competent Authority in law permitting this deviation and be submitted in original with the request for consent to operate.
12. That there is no discharge directly or indirectly from the unit or the process into any interstate river or Yamuna River or River Ghaggar.
13. That the industry or the unit concerned is not sited within any prohibited distances according to the Environmental Laws and Rules, Notification, Orders and Policies of Central Pollution control Board and Haryana State Pollution Control Board.
14. That of the unit is discharging its sewage or trade effluent into the public sewer meant to receive trade effluent from industries etc. then the permission of the Competent Authority owing and operating such public sewer giving permission letter to his unit shall be submitted at time of consent to operate.
15. That if at any time, there is adverse report from any adjoining neighbor or any other aggrieved party or Municipal Committee or Zila Parishad or any other public body against the unit's pollution; the Consent to Establish so granted shall be revoked.
16. That all the financial dues required under the rules and policies of the Board have been deposited in full by the unit for this Consent to Establish.
17. In case of change of name from previous Consent to Establish granted, fresh Consent to Establish fee shall be levied.
18. Industry should adopt water conservation measures to ensure minimum consumption of water in their Process. Ground water based proposals of new industries should get clearance from Central Ground Water Authority for scientific development of previous resource.
19. That the unit will take all other clearances from concerned agencies, whenever required.
20. That the unit will not change its process without the prior permission of the Board.
21. That the Consent to Establish so granted will be invalid, if the unit falls in Aravali Area or non conforming area.
22. That the unit will comply with the Hazardous Waste Management Rules and will also make the non-leachate pit for storage of Hazardous waste and will undertake not to dispose off the same except for pit in their own premises or with the authorized disposal authority.
23. That the unit will submit an undertaking that it will comply with all the specific and general conditions as imposed in the above Consent to Establish within 30 days failing which Consent to Establish will be revoked.
24. That unit will obtain EIA from MoEF, if required at any stage.
25. In case of unit does not comply with the above conditions within the stipulated period, Consent to Establish will be revoked.
26. That unit will obtain consent to operate from the board before the start of product activity.

Specific Conditions

Other Conditions :

1. The unit will provide required adequate pollution control measures i.e. ETP and APCM as per scheme submitted before starting production.
2. The unit will strictly comply with the directions of MOEF w.r.t. SOP.

*Regional Officer, Bahadurgarh
Haryana State Pollution Control Board,
Panchkula.*

Consent to Operate issued by HPCB



HARYANA STATE POLLUTION CONTROL BOARD

**SCF No. 42 & 43, Shopping Centre, Sector-6,
Huda, Bahadurgarh Ph. 01276-243077 (O)**

E-mail: hspcb.pkl@sify.com



No. HSPCB/Consent/ : 329805019ROHCTO6386171

Dated:11/03/2019

To.

M/s :S G PETROTEC

KHEWAT NO. 305, ISMAILA 11-B, ISMAILA ROAD, TEH. SAMPLA

Subject: Grant of consent to operate to M/s S G PETROTEC.

Please refer to your application no. 6386171 received on dated 2019-02-25 in regional office Bahadurgarh. With reference to your above application for consent to operate, M/s S G PETROTEC is here by granted consent as per following specification/Terms and conditions.

Consent Under	BOTH
Period of consent	11/03/2019 - 31/03/2028
Industry Type	Recycling/Pyrolysis plant of waste pneumatic tyre/ tyre scraps
Category	ORANGE
Investment(In Lakh)	136.0
Total Land Area(Sq. meter)	5700.0
Total Builtup Area(Sq. meter)	2000.0
Quantity of effluent	
1. Trade	1.0 KL/Day
2. Domestic	1.0 KL/Day
Number of outlets	2.0
Mode of discharge	
1. Domestic	Septic Tank
2. Trade	Recycling/Reuse in Horticulture
Domestic Effluent Parameters	
1. NA	
Trade Effluent Parameters	
1. BOD	30 mg/l
2. COD	250 mg/l
3. TSS	100 mg/l
4. Oil & Grease	10 mg/l
5. pH value	5.5-9.0
Number of stacks	1
Height of stack	
1. Stack to 5 Nos Reactors	30 meter
Emission parameters	

1. SPM	150 mg/m ³
Product Details	
1. Oil	20 Kilo liters/Day
2. Carbon Black	16 Metric Tonnes/day
3. Steel cord	4 Metric Tonnes/day
Capacity of boiler	
1. NA	Ton/hr
Type of Furnace	
1. NA	
Type of Fuel	
1. Diesel/Gas	0.200 KL/day
Raw Material Details	
Waste tyre rubber	40 Metric Tonnes/Day

Krishan Kumar Digitally signed by Krishan Kumar
Date: 2019.03.11 17:55:36 +05'3

*Regional Officer, Bahadurgar.
Haryana State Pollution Control Board*

Terms and conditions

1. The applicants shall maintain good house keeping both within factory and in the premises. All hose pipelines valves, storage tanks etc. shall be leak proof. In plant allowable pollutants levels, if specified by State Board should be met strictly.
2. The applicant/company shall comply with and carry out directive/orders issued by the Board in this consent order at all subsequent times without negligence of his /its part. The applicant/company shall be liable for such legal action against him as per provision of the law/act in case of violation of any order/directives. Issued at any time and or non compliance of the terms and conditions of his consent order.
3. The applicant shall make an application for grant of consent at least 90 days before the date of expiry of this consent.
4. Necessary fee as prescribed for obtaining renewal consent shall be paid by the applicant alongwith the consent application.
5. If due to any technological improvement or otherwise this Board is of opinion that all or any of the conditions referred to above required variation (including the change of any control equipment either in whole or in part) this Board shall after giving the applicant an opportunity of being heard vary all or such condition and there upon the applicant shall be bound to comply with the conditions so varied.
6. The industry shall provide adequate arrangement for fighting the accidental leakages, discharge of any pollutants gas/liquids from the vessels, mechanical equipment etc. which are likely to cause environment pollution.
7. The industry shall comply noise pollution (Regulation and control) Rules, 2000.
8. The industry shall comply all the direction/Rules/Instructions as may be issued by the MOEF/CPCB/HSPCB from time to time.
9. The industry shall ensure that various characteristics of the effluents remain within the tolerance limits as specified in EPA Standard and as amended from time to time and at no time the concentration of any characteristics should exceed these limits for discharge.

10. The industry would immediately submit the revised application to the Board in the event of any change in the raw material in process, mode of treatment/discharge of effluent. In case of change of process at any stage during the consent period, the industry shall submit fresh consent application alongwith the consent to operate fee, if found due, which may be on any account and that shall be paid by the industry and the industry would immediately submit the consent application to the Board in the event of any change during the year in the raw material, quantity, quality of the effluent, mode of discharge, treatment facilities etc.
11. The officer/official of the Board shall reserve the right to access for the inspection of the industry in connection with the various process and the treatment facilities. The consent to operate is subject to review by the Board at any time.
12. Permissible limits for any pollutants mentioned in the consent to operate order should not exceed the concentration permitted in the effluent by the Board.
13. The industry shall pay the balance fee, in case it is found due from the industry at any time later on.
14. If the industry fails to adhere to any of the conditions of this consent to operate order, the consent to operate so granted shall automatically lapse.
15. If the industry is closed temporarily at its own, they shall inform the Board and obtain permission before restart of the unit.
16. The industry shall comply all the Directions/ Rules/Instructions issued from time to time by the Board.

HARYANA STATE Specific Conditions :

1. The unit will submit analysis report of air emissions and trade effluent from boards lab and agreement with GEPIL within 3 months of grant of consent and will follow the SOPs during operation of the plant.
2. The unit will handle carbon black properly and take all measures to control odour problem.
3. The unit will obtain necessary permission from the Fire department.
4. The unit will make the open ground paved with bricks for better environment within the premises.
5. The unit will apply next CTO 90 days in advance of the expiry of the present CTO.

Krishan Kumar Digitally signed by Krishan Kumar
Date: 2019.03.11 17:56:25 +05'30'
Regional Officer, Bahadurgarh
Haryana State Pollution Control Board.

Authorization Issued by Hazardous Waste

Application no. :6404214
Industry id: 17ROH3978712
Date: 07/04/2019



Haryana State Pollution Control Board
SCF No. 42 & 43, Shopping Centre, Sector-6, Huda,
Bahadurgarh Ph. 01276-243077 (O)



No. :HWR/ROH/2019/6404214

DT: 07/04/2019

To

M/s S G PETROTEC
KHEWAT NO. 305, ISMAILA 11-B, ISMAILA ROAD, TEH. SAMPLA
Rohtak

Sub: Grant of authorization for Recycling of Hazardous Waste as listed in Schedule - IV under Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016.

1. Number of authorization:HWR/ROH/2019/6404214 date of issue: 11/03/2019
2. Reference of application:6404214 dated: 07/04/2019
3. Sh. PIYUSH AGGARWAL of M/s S G PETROTEC is hereby granted an authorization based on the enclosed signed inspection report for generation, storage, transportation, reception, recycling, pre-processing, utilisation, disposal or any other use of hazardous or other wastes or both on the premises situated at KHEWAT NO. 305, ISMAILA 11-B, ISMAILA ROAD, TEH. SAMPLA

Details of Authorization

S.No.	Category of Hazardous Waste as per the Schedule of these rules	Authorised mode of disposal or recycling etc.	Quantity (ton/annum)
1	Part B, B3-B3140	Utilization in the process	12000 T/Annum

1. The authorization shall be valid for a period of 11/03/2019 to 31/03/2028
2. The authorization is subject to the following general and specific conditions

General Conditions of the Authorization:

1. The authorised person shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.
2. The authorization 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 authorization.
4. Any unauthorised change in personnel equipment or working conditions as mentioned in the application by the person authorised shall constitute a breach of this authorization.

5. The person authorised shall implement Emergency Response Procedure (ERP) for which this authorization 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, if any, 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 waste, idf any, shall be maintained
10. The hazardous waste including residue generated from the recycling process shall be disposed off as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
11. In case of import of hazardous waste by the unit, the relevant provisions for import of the hazardous waste in the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 shall be complied with and the unit shall bear the cost of import or export and mitigation of damages if any.
12. An application for the renewal of an authorization shall be made 03 months before the expiry of such authorisation as laid down under these rules.
13. The authorised occupier of the unit shall maintain a record of hazardous and other wastes managed by him in Form 3 and prepare and submit to the Haryana State Pollution Control Board (HSPCB), an annual return containing the details specified in Form 4 on or before the 30th day of June following the financial year to which that return relates.

Krishan Kumar

Digitally signed by Krishan Kumar
Date: 2019.04.07 18:03:13 +05'30'

Regional Officer Bahadurgarh

For Haryana State Pollution Control Board

Factory License

BIP ID : 15660

GOVERNMENT OF HARYANA

CHIEF INSPECTOR OF
FACTORIES, HARYANA



सत्यमेव जयते

DESCRIPTION OF THE LICENCED PREMISES

The licenced premissis shown on
Building Plan approved vide No.

FBP_3673

Dated- 01-05-2019

are situated at the address given
above and consist of building
as per approved drawings.



DIRECTORATE OF
INDUSTRIAL SAFETY
& HEALTH

LABOUR DEPARTMENT
HARYANA, CHANDIGARH

Application ID : 50231

Issued On: 25-11-2020

Form No. 4 (PRESCRIBED UNDER RULE 8)

RENEWAL OF FACTORY LICENCE

उत्पादकता एवं सामाजिक न्याय
PRODUCTIVITY WITH SOCIAL JUSTICE

LABOUR DEPARTMENT HARYANA
श्रम विभाग हरियाणा

शान्ति, सामंजस्य एवं सुरक्षा
PEACE, HARMONY AND SAFETY

*L*icence is hereby granted to

Occupier Details

Sh./Smt. Piyush Aggarwal

Factory Details

M/s SG PETROTEC

**KHASRA NO. 140//13/1,13/2, 19/1/1,18/1,
1169/1/1/2, ,**

Sampla, Rohtak

Licence Registration No. **RTK-ONLINE-CHD-S-232**

Licence Serial No. **RTK-ONLINE-CHD-S-232**

valid for the premises described below for use as a
factory is hereby renewed for the year **2021**.....

subject to the provisions of the Factories Act, 1948
and the rules made thereunder.

This licence shall remain in force till 31st day of
December **2021**.....

RENEWAL DETAILS

Year	Maximum Horse Power	Maximum No. of Workers	Amount of Fee paid	Authorised Officer
2021	134	40	15000	ADISH-RTK



Auto Renewal

For Chief Inspector of Factories,
Haryana, Chandigarh

This is computer generated factory license to check & verify, please login to
<http://hrylabour.gov.in> with factory license verify no **ada0 6a57 b03c a532**

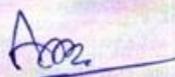
* Annexure :- A

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Mr. Anil
2.	Age/ Gender	46 / male
3.	Address /Contact number	Ismaliq Village. +91 9728225518
4.	Proximity of person from unit	1.0 km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	-
6.	Specify if the person has any Health issue. Also mention duration	-
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	All good no any health issue.

Date 06/08/2021

Place Ismaliq Village


Anam Chhetri (Manager)
Name & designation of inspecting officer



-6/8-

Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Mr. Praveen
2.	Age/ Gender	39 / Male
3.	Address /Contact number	Ismaliq Village +91 9138380085
4.	Proximity of person from unit	1.0 km.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	-
6.	Specify if the person has any Health issue. Also mention duration	-
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	All good no any health issue.

Date 06/08/2021
Place Ismaliq Village.

Arund Kumar
Name & designation of inspecting officer



Arund Kumar

* Annexure:- A

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Mr. Mandeeb
2.	Age/ Gender	52 / Male
3.	Address /Contact number	Ismalia Village. +91 8053 88 00 72
4.	Proximity of person from unit	1.0 km.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	No. Any issues. all good.

Date 06/08/2021

Place Ismalia Village.

^{Asst}
Arjun Chaturvedi (Manager)
Name & designation of inspecting officer



-6/8-

Arvind Kumar

* Annexure: - A

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Nagesh
2.	Age/ Gender	46 / Male
3.	Address /Contact number	Ismaliq Village. +91 9812128122
4.	Proximity of person from unit	1.0 KM.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	-
6.	Specify if the person has any Health issue. Also mention duration	-
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	All good no any health issues.

Date 06/08/201
Place Ismaliq village

^{Am}
Aoun Chaturvedi (Manager)
Name & designation of inspecting officer



-6/8-

Anand Kumar

* Annexure :- A

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Karunnaer Singh
2.	Age/ Gender	34 / Male
3.	Address /Contact number	Ismaliq Village. +918053541711
4.	Proximity of person from unit	1.0 km.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All good no any issues.

Date 06/08/2021

Place Ismaliq Village

Arum Chaturvedi (Munayee)
Name & designation of inspecting officer



-6/8-

Arum Chaturvedi

* Annexure:- A

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Dinesh Kumar
2.	Age/ Gender	Male / 36
3.	Address /Contact number	Ismaliya Village +91 9991265450
4.	Proximity of person from unit	1.0 km.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All good no any issue.

Date 06/08/2021

Place Ismaliya Village

Arum
Arum Chaturvedi (Manager)
Name & designation of inspecting officer



-6/8-

Anand Kumar

Study Report on existing batch process unit of M/s Tirath Ram & Co (Unit-II), Kum Khurd Road, Ludhiana.

1. Background

In compliance with NGT order dated 06.01.2020 in the matter of OA No. 400/2019, study was carried out during 13.08.2021 to 15.08.2021 at M/s Tirath Ram & Co (Unit-II), Ludhiana, Punjab following the protocol as detailed below:

- The monitoring will be carried out at both work place as well as ambient air quality with following parameters:
 - Work Place Monitoring (to cover entire production cycle of TPO i.e. feeding of reactor, pyrolysis of rubber, cooling period and unloading of reactor i.e. removal of carbon & steel) for Respirable dust (PM₁₀, PM_{2.5}), CO, VOCs, B(a)P,
 - Ambient Air Quality Monitoring (24 hr. monitoring) for PM₁₀, PM_{2.5}, B(a)P, VOCs
- In case of batch process monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of carbon black powder & steel for comparison purpose.
- For ambient air quality, monitoring to be carried out for 24 hr. time weighted average during operation of the plant at two to four locations.
- Work Place monitoring to be carried at two to four locations and should cover entire manufacturing process of TPO i.e. i.e. feeding of reactor, pyrolysis of tyre, cooling period and unloading of reactor.
- Detailed analysis of tyre pyrolysis oil (as per schedule V Part B of Hazardous & other waste (M&TM) Rules 2016) in terms of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content.
- Detailed compositional Analysis of TPO w.r.t Carbon Number, specific gravity/density, Acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson carbon residue), Ash content, Pour Point, PONA (Paraffin, Olefins, Naphtha, Aromatics)
- Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analysed.
- Locations and numbers of sensors/alarms.
- Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire (draft questionnaire attached)
- Health assessment of workers through questionnaire.
- Any other parameter of interest if found to be useful during the study may also be included.

Accordingly monitoring was carried out during August 13, 2021 to August 15, 2021 by CPCB team lead by Shri Tarun Darbari, Scientist 'D' at the aforesaid unit M/s Tirath Ram & Co (Unit-II), located at Kum Khurd Road, Ludhiana, Punjab and sampling was carried out through a laboratory- M/s Fare Labs Private Limited recognized under the Environment (Protection) Act, 1986. Mr. Arun Chaturvedi, Manager (Environment Air Section) represented as team leader from the laboratory side during the sampling. Shri Amit Kumar SRF and Shri Omesh Kumar, SA from CPCB and Shri Jaspal Singh, AEE & Shri Rozer Dhamija, AEE from Punjab Pollution Control Board were present during study.

2. About the Industry – location, plant & machineries

M/s Tirath Ram & Co, (Unit – II) is located at Kum Khurd Road, Sub. Tehsil – Kum Kalan, Ludhiana, Punjab. The total land area of the unit is 5000 sq. meter. The unit is carrying out production of Tyre Pyrolysis Oil (TPO) by using existing

batch process. The unit has one horizontal type reactor having capacity of 10 MT. The production process completes in around 36 hours (4 hour tyre feeding, 14-15 Hours of heating & 15 Hours of cooling). Wood is being used as fuel for initial heating of reactor after 6-7 hours of heating production of pyro gas takes places and this gas is used as fuel for further heating of the reactor. The reactor has temperature gauge only. Temperature and pressure gauge was also installed at primary tank. The reactor is covered with canopy. Front, back and bottom sides of reactor is without canopy. The canopy is connected with scrubber and stack of 30-meter height for emission of flue gases. The reactor has spiral arrangement, which helps in unloading of carbon black. For removal of carbon black, the reactor is moved slowly in counter clockwise direction resulting into unloading of carbon black in the carbon storage room built underground below the reactor through a chute. The chute of the reactor is opened manually through a door provided in the canopy. Reactor is attached with condensers and to primary oil collection tank. From the collection tanks the tyre pyrolysis oil (TPO) is transferred into a common oil storage tank. There are 10 number of workers working in the plant. The plant has open shed having concrete flooring.

The unit has valid CTO under Air Act 1974 & Water Act 1981 issued by Punjab Pollution Control Board. As per CTO the unit has been given consent to process Waste tyre @10 MT/day. The consented products are Pyrolysis oil @3.5 MT/day, Carbon black @4mT/day, Light Fuel Gas@2MT/day, Wax@ 0.5MT/day@steel wire @2MT/day. Google Map showing location of the plant as below:



Google Map showing location of M/s Tirath Ram & Co, (Unit – II) is located at Kum Khurd Road, Sub. Tehsil – Kum Kalan, Ludhiana, Punjab

3. Tyre Pyrolysis Process and Environmental Status:

The study was carried out during August 13 to 15, 2021. The unit procure waste tyres from local market (within Punjab only) as waste tyre from outside Punjab is not allowed for processing in Punjab. The unit prefer radial tyres for processing. The waste tyres were stored in open space. The feeding was manual and in one feeding 200-250 tyres (8-9 MT) were used. During feeding, two persons stack the tyre in reactor. After completion of feeding process, initial firing of reactor takes places with the wooden blocks. In one firing around five (5) MT of wooden is used. After 6-7 hours of initial firing, production of pyro gas started and that was used as fuel

for complete pyrolysis process. Extra gas flare through the flaring system. The production of oil starts at 100°C and continues till the temperature goes to 200°C to 270°C. The oil passes through different condensers and finally into oil storage tank. After 14-15 hours of heating, cooling process starts and when the reactor temperature reaches 50°C, unloading of carbon black starts. The reactor has spiral arrangement for removal of Carbon Black Powder from reactor. The carbon black powder is stored in an underground pit below the reactor. From carbon black storage tank, electrically operated screw conveyor is used for transfer of carbon black powder from storage tank to the bags being hand held by the labors during the unloading operation and the carbon black powder falls in the bag and once the bag gets filled it is replaced by another bag and the cycle repeats.

During study around 8 MT of waste tyres in de-beaded form was fed into the reactor. The process involved

- Loading of waste tyres in the reactor
- Pyrolysis process
- Cooling Period
- Unloading of carbon black from the reactor
- Unloading of Steel Scrap

Various activities during tyre Waste pyrolysis and reading of Temperature and pressures

Date	Time	Temperature °C	Activities
		Reactor	
14.08.2021	10:00 AM to 02:00 PM		Tyre feeding to the reactor
	2:00 PM	35	Heating of the Reactor started by wood for 6-7 hours and further switching on the Burners
	3:00 PM	50	
	4:00 PM	60	
	5:00 PM	80	
	6:00 PM	85	
	7:00 PM	90	
	8:00PM	95	
	9:00 PM	100	
	10:00 PM	130	
	11:00 PM	140	
15.08.2021	12:00AM	260	
	4:00 AM	270	
	5:00 AM	250	
	6:00 AM	245	

Date	Time	Temperature °C	Activities
		Reactor	
	7:00 AM	240	Cooling of the Pyrolysis Reactor started by switching off the Burners
	8:00 AM	220	
	9:00 AM	185	
	10:00 AM	175	
	11:00 AM	155	
	12:00 PM	128	
	1:00 PM	115	
	2:00 PM	100	
	3:00 PM	95	
	4:00 PM	90	
	5:00 PM	85	Cooling of the Pyrolysis Reactor started by switching off the Burners 7:00
	6:00 PM	80	
	7:00 PM	75	
	8:00 PM	70	
	9:00 PM	65	
	10:00 PM	60	
	11:00 PM	55	
16.08.2021	12:00 AM	50	Carbon Bagging process started at 12:00 AM to 4:00 AM
	1:00 AM	45	
	2:00 AM	45	
	3:00 AM	40	
	4:00 AM	40	
	5:00 AM	35	Opening of Reactor gate and steel scrap unloading from the Reactor
	6:00 AM	30	
	7:00 AM	30	

a. Ambient Air Quality Monitoring

The ambient air quality monitoring was carried out in four (04) locations by taking into considerations the predominant wind direction of the area (AAQ1 to AAQ4). The monitoring was carried out for PM₁₀, PM_{2.5}, VOCs & B (a) P using Respirable Dust Sampler (Envirotech, FLE No-709), Fine Particulate Sampler (Envirotech, FLE No-713), OVS Sampler (FLE-721). The air quality was monitored as 24 hourly average monitoring values. Google map showing location of monitoring stations is given below:



Ambient Air Quality Monitoring Stations (AAQMS) at 04 locations

Ambient Air Quality Monitoring Results:

S. No.	Parameters	AAQ1	AAQ2	AAQ3	AAQ4	NAAQS	Protocol Followed
1	Particulate Matter (PM _{2.5}), µg/m ³	52.88	84.34	67.29	98.88	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	94.14	121.41	115.05	126.44	100	IS-5182(P-23)
3	Benzene, µg/m ³	1.88	3.89	4.92	8.44	5(Annual)	FL/SOP/GC-46

S. No.	Parameters	AAQ1	AAQ2	AAQ3	AAQ4	NAAQS (Std.)	Protocol Followed
4	Toluene, $\mu\text{g}/\text{m}^3$	2.92	5.54	19.85	18.52	NA	FL/SOP/GC-46
5	p-Xylene, $\mu\text{g}/\text{m}^3$	0.79	2.88	34.10	38.99	NA	FL/SOP/GC-46
6	o-Xylene, $\mu\text{g}/\text{m}^3$	0.95	0.72	13.21	32.78	NA	FL/SOP/GC-46
7	m-Xylene, $\mu\text{g}/\text{m}^3$	0.64	ND,[DL-0.02]	ND,[DL-0.02]	ND,[DL-0.02]	NA	FL/SOP/GC-46
8	Benzo (a) Pyrene, ng/m^3	ND,[DL-0.5]	ND,[DL-0.5]	ND,[DL-0.5]	ND,[DL-0.5]	1(Annual Std.)	Method of Air-Sampling & Analysis (102)

- The levels of $\text{PM}_{2.5}$ were exceeding the standards at three locations i.e. AAQ2, AAQ3 & AAQ4. The value of $\text{PM}_{2.5}$ was highest at location AAQ4 located near DG set. The $\text{PM}_{2.5}$ levels were in the range of $52.88 \mu\text{g}/\text{m}^3$ to $98.88 \mu\text{g}/\text{m}^3$
- The Levels of PM_{10} were exceeding the prescribed standards in same three locations i.e. AAQ2, AAQ3 & AAQ4. The value of PM_{10} was highest at location AAQ4 located near DG set. The PM_{10} levels were in the range of $94.14 \mu\text{g}/\text{m}^3$ to $126.44 \mu\text{g}/\text{m}^3$
- VOCs have been analyzed in the terms of BTX i.e. Benzene, Toluene & Xylene
- The levels of Benzene appears to be on higher side at one location i.e. at location AAQ4. The benzene levels were in the range of $1.88 \mu\text{g}/\text{m}^3$ to $8.44 \mu\text{g}/\text{m}^3$. These are 24 hour values where as standard is annual average.
- The levels of Benzo (a) Pyrene were below detection limit.

Ambient Air Quality Monitoring Stations



b. Work Zone Monitoring

The work zone monitoring was carried out as per the protocol w.r.t PM₁₀, PM_{2.5}, CO, VOCs & B(a)P. The work Zone monitoring was carried out at four locations inside the work place where reactor was installed (WZAQ1 to WZAQ4). The first location was setup near Panel area. Second was near wood storage area. Third was close to the opening of reactor which was functional at the time of study while fourth station was at the backside of the reactors. The monitoring was carried out to cover the entire production process i.e. from loading of tyres in the reactors to unloading of carbon black and steel wire. The monitoring was carried out using Fine Particulate Sampler (Envirotech, FLE No-717 & 697), CO Analyzer (Ecotech FLE-149) OVS Sampler



Work Zone Air Quality Monitoring Stations (WZAQMS)

Results of Work Zone Monitoring

S. No.	Parameters	WZAQ1	WZAQ2	WZAQ3	WZAQ4	OSHA 3430-04:2011 Standards	Indian Factory Act 1948	Test Method
3	Particulate matter (PM _{2.5}), µg/m ³	89.55	79.84	42.23	110.05	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	136.82	110.12	92.14	172.94	NA	NA	FL/SOP/ENV-19
3	Benzene, ppm	0.74	0.68	0.65	0.84	1	10	FL/SOP/GC-46
4	Toluene, ppm	8.10	6.42	15.10	20.14	200	100	FL/SOP/GC-46
5	Xylene (p, o. m), ppm	22.13	39	57.9	52.22	100	100	FL/SOP/GC-46
6	Benzo (a) Pyrene, mg/m ³	0.088	ND[DL-0.02]	ND[DL-0.02]	0.089	0.2	NA	NIOSH Method 5506
7	Carbon Monoxide (as CO), mg/m ³	3.66	3.45	4.86	6.44	50	40	FL/SOP/GC-25

- The levels of PM_{2.5} were in the range of 42.23 µg/m³ to 110.05 µg/m³. The highest value of 110.05 µg/m³ was observed in the station WZAQ4 which was on backside of the reactor.
- The levels of PM₁₀ were in the range of 92.14µg/m³ to 172.94 µg/m³. The highest levels were observed at WPAQ4.
- Monitoring of VOCs was done w.r.t BTX i.e Benzene, Toluene & Xylene. The levels of BTX were within the prescribed permissible limits of exposure limit (PEL) of OSHA and Indian Factory Act Standard 1948 at all the monitoring locations.
- The levels of B(a)P were within the permissible limits of exposure (PEL) of OSHA
- The levels of CO were within the prescribed under limit of Indian factory act 1948 as well as OSHA permissible exposure limits.
- Detailed analysis results are enclosed.

WORK Zone AIR QUALITY MONITORING STATIONS



WZAQ4 (Back Side Area of Reactor)



WZAQ3 (Near Panel Area)



WZAQ1 (Near Reactor loading Area)



WZAQ2 (Near Wood Storage Area)

c. Analysis of Tyre Pyrolysis Oil

The detailed analysis of Tyre Pyrolysis was done as follows:

- **Detailed analysis of tyre pyrolysis oil** (as per schedule V part B of HOWM Rules 2016) in terms of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium+chromium+ nickel, PAH, Total halogens, PCBs, and water content.
- **Detailed compositional Analysis of TPO** w.r.t Carbon Number, specific gravity/density, Acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson carbon residue), Ash content, Pour Point, PONA (Paraffin, Olefins, Naphtha, Aromatics).
- During the study, the analysis of tyre pyrolysis oil (TPO) was also carried out. There is no specific standard prescribed for oil derived from waste/scrap tyres. So the TPO was compared with the parameters specified for fuel derived from the waste oil as notified in Hazardous and Other Waste (Management and transboundary) Rules,

2016 Schedule – V Part – B. The analysis of the TPO reveals that value of parameters are well within the limits prescribed for fuel derived from waste oil under schedule V part B of HoWM rules 2016.

Analysis result of Tyre Pyrolysis Oil

S. No.	Parameter	Test Result	Maximum Permissible limits	Protocol
1	Density, Kg/L	0.943	NS	IS-1448:P-16
2	Kinematic Viscosity @ 40°C , cSt	5.19	NS	IS-1448:P-25
3	Flash Point, °C	54	NS	IS-1448:P-21
4	Sulphur Content, % wt.	1.28	4.5	IS-1448:P-33
5	Conradson Carbon Residue (10% residue), % wt.	3.41	NS	IS-1448:P-122
6	Water Content, % wt.	0.14	1	ISO-12937
7	Total Halogens, ppm	146.27	4000	USEPA Method-9076
8	Carbon Number	C ₈ -C ₃₀	NS	FL/SOP/GC-97
9	Acidity on Burning Tip, mgKOH/g	0.167	NS	ISO 6618
10	Boiling Range, °C	66.4 to 312	NS	IS-1448: P-18
11	Ash Content, % wt.	0.087	NS	IS-1448: P-4
12	Pour Point, °C	-8	NS	IS-1448:P-10
13	PONA (Paraffin, Olefins, Naphtha, Aromatics), % volume	69.53	NS	FL/SOP/GC-98
14	Calorific Value, Kcal/kg	9926.38	NS	IS-1448:P-6
15	Sediments, % wt.	0.0063	0.25	IS-1448:P-30
16	Lead, ppm	ND, [LOQ-0.3]	100	USEPA Method-3031
17	Cadmium, ppm	ND, [LOQ-0.3]	500	USEPA Method-3031
18	Chromium, ppm	ND, [LOQ-0.3]		USEPA Method-3031
19	Nickel, ppm	ND, [LOQ-0.3]		USEPA Method-3031
20	Arsenic, ppm	ND, [LOQ-0.3]	5	USEPA Method-3031
21	Polyaromatic Hydrocarbons (PAHs), % wt.	0.21	6	FL/SOP/HPLCP-31
22	Polychlorinated biphenyls (PCBs), ppm	BLQ , [LOQ-0.01]	2	FL/SOP/GCMS/ P-04

d. Status of Environmental Concerns:

➤ Spillage and Fugitive emission of black carbon in the working area

At the end of pyrolysis process, the carbon black was unloaded into a storage tank built underground below the reactor. The unloading started when the temperature of reactor was 50°C without nitrogen purging. Electrically operated screw conveyor is used for transfer of carbon black powder from storage tank to the bags being hand held by the labors during the unloading operation and the carbon black powder falls in the bag and once the bag gets filled it is replaced by another bag and the cycle repeats. The

unloading of carbon black powder was not completely mechanized and had manual intervention. Exposure to workers of fine carbon particle is observed during transfer of carbon black from screw conveyor to bags. No major fugitive emissions were observed during the unloading operation. The reactor had proper sealing system. However, some emission took place during taking out of steel scrap from reactor.

➤ **Escape of pyro gas**

The reactor gate was opened without nitrogen purging when the temperature of primary tank was 35°C, this may lead to escaping of pyro gas into the environment.

Arrangement for nitrogen purging, installation of gas sensor for carbon monoxide (CO) and methane (CH₄) have to be made.

➤ **Flaring of excess Pyro gas**

The unit has arrangement for utilization of pyro gas generated from the pyrolysis operation at the reactor for self-heating. Provision for flaring of excess pyro gas and also the entire pyro gas in case of emergency has been made. There is a separate arrangement for flaring of pyro gas at 30 meter heights.

There is no arrangement of bypassing the pyro gas has been made in case of choking or blockage of vents inside the reactor during pyrolysis operation. No sensor system to track leakages were observed. During the inspection, it was observed that the pressure and temperature were being monitored and any increase in pressure, the gas is flared. No emergency situation noticed during this monitoring period.

Arrangement of differential pressure gauge, sensors and alarm system (hooter) have to be made for emergency.

➤ **Removal of Steel Scrap**

The steel scrap is removed in a mechanized manner and stored in the open storage yard. Removal of steel scrap from the reactor generates fugitive emission and exposes workers to fine carbon particle.

Arrangement for minimizing fugitive emission during removal of steel scrap like sprinkling of water and suction hood over the door of the reactor and mechanical system (wheeled trolley) for movement of steel scrap from reactor to storage area be made.

➤ **Waste Water treatment**

The unit used underground water for wet scrubber. **No ETP was found at the unit. There was no arrangement for treatment of waste water generated from scrubbers and condensers.**

➤ **Odor problem in plant and in neighborhood**

During study odor was observed in the scale of one (1) for around 30 min during process, if measured in the scale of 1-10. As per the questionnaire survey carried out among nearby villagers & plant personals it was informed that no problem of odor or dust issue found due to operation of this unit.

➤ **Storage of raw material**

The scrap tyres were kept in open concrete area in a segregated manner.

➤ **Roads & Floors in the unit**

The unit has cemented floor and roads.

➤ **Exposure of workers to fine carbon particles;**

Workers are provided with proper Personnel Protective Equipment (PPE) such as mask, gloves, and boots. However, chances of exposure to fine carbon is there during unloading of steel scrap

➤ **Air Pollution Control System:**

The unit has one wet scrubber along with stack of 30m height for controlling flue gas emissions. Apart from it, proper flaring system has been installed by the unit.

➤ **Scrubber and Stack for flue gas emission**

For controlling emissions from combustion of fuel used for firing and heating of the reactor, the unit has installed scrubber along with a stack of 30m height.

e. Health Survey

Surveys to assess health & odor issues were carried out through questionnaire. Survey was carried out for people residing within 1km radius of the unit and also with workers working in the unit.

- The survey of nearby residents carried out at the time of study reveals no health, dust or odor problems due to operation of the unit.
- Survey of workers of the unit also revealed no health issues due to working in the unit.

4. Observation and recommendation for Improvement

Observations:

- i. During monitoring and sampling, the officials observed fugitive emission and odor only for 30 min during pyrolysis process. The odor value can be scaled as one (1) in the scale of 1 to 10.
- ii. Fugitive emissions observed during transfer of carbon black from screw conveyor to bag and during unloading of steel scrap.
- iii. The levels of PM_{2.5} and PM₁₀ were exceeding the prescribed limit for ambient air at three locations.
- iv. The levels of benzene were on higher side in the ambient air at one location but cannot be compared with prescribed limit, which is an annual limit and in the present case the monitoring were carried out only for 24 hours.
- v. In the work zone there is no limit prescribed for PM₁₀ and PM_{2.5} under Air Act, 1981 or under E (P) Act 1986. In the Indian factory act 1948, limit for BTX has been provided.
- vi. In the work zone the limit of BTX is within the limit prescribed under Indian factory act of 1948.
- vii. The tyre pyrolysis oil (TPO) have a calorific value of above 9900 Kcal/kg.
- viii. Compared with the limits prescribed for fuel oil derived from waste oil, the values for TPO is well within the limits.
- ix. **Carbon number of TPO appears to be from C₈ to C₃₀. The flash point is 54°C and the Sulphur content is 1.27 % and boiling range is 66.4 to 312. Ash content is 0.087**

Recommendations:

- i. Suction hood of sufficient capacity connected to air pollution control devices (APCDs) needs to be provided over the reactor gate and bagging area for reduction of fugitive emissions.
- ii. The entire pyrolysis operation be carried out through programme logic controller (PLC) with adequate number of pressure and temperature gauge and with safety valves and bypass arrangements.
- iii. Adequate number of gas sensors (methane, carbon mono oxides and VOCs) along with alarm system (hooter) be installed within the work zone.
- iv. A bypass system for bypassing pyro gas in case of blocking/choking of vent within the reactor be installed and to be connected with primary tank and flaring system.
- v. Carbon black has to be bagged mechanically without any spillage and fugitive emission. Arrangement for preventing spillage and fugitive emission during transfer of carbon black from conveyor to bag be made.
- vi. Arrangement of suitable trays with wheels for transporting the steel scrap within the premise from generation points to storage points to be made to avoid spillage of carbon particle attached with steel scrap.
- vii. ETP has to be installed for treatment of process waste water generated from scrubbers and condensers etc.
- viii. Waste tyre be kept in a shaded area.
- ix. Firefighting equipment be installed in adequate number.

Amit Kumar

Amit Kumar
SRF, WM-III Div

Tarun Darbari

Tarun Darbari
Scientist "D" WM-III Div

ENCLOSURES

AMBIENT AIR QUALITY MONITORING AT AAQ1

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 10:20 AM to 10:20 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: Tirath Ram and co Macchiwara Link Rd Kohara, Punjab 14112 Warehouse
Sampling Location	: AAQ – 001 (Near Main gate)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.15
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N30.53214, E76.04254
Ambient Temperature (°C)	: 34
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-694) Fine Particulate Sampler (Envirotech, FLE No-697), OVS Sampler (Envirotech, FLE-723)

Analysis Report

S. No.	Parameters	Test Results	NAAQS	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	52.88	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	94.14	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	1.88	5	FL/SOP/GC-46
4	Toluene, µg/m ³	2.92	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	0.79	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	0.95	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	0.64	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND,[DL- 0.5]	1	Method of Air- Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)

FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Conforms** to NAAQS 2009

AMBIENT AIR QUALITY MONITORING AT AAQ2

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 10:30 AM to 10:30 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab 14112 Warehouse
Sampling Location	: AAQ – 002 (Near Tyre cutting plant)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.1
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N30.53214, E76.04254
Ambient Temperature (°C)	: 34
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No- 703) Fine Particulate Sampler (Envirotech, FLE

Analysis Report

S. No.	Parameters	Test Results	NAAQS	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	84.34	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	121.41	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	3.89	5	FL/SOP/GC-46
4	Toluene, µg/m ³	5.54	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	2.88	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	0.72	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND,[DL- 0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND,[DL- 0.5]	1	Method of Air- Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Do Not conforms** to NAAQS 2009 Except for **Benzene & Benzo (a) Pyrene** value.

AMBIENT AIR QUALITY MONITORING AT AAQ3

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 10:45 AM to 10:45 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab 14112 Warehouse
Sampling Location	: AAQ-04 (Near DG Area)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.1
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N30.53214, E76.04254
Ambient Temperature (°C)	: 34
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-691) Fine Particulate Sampler (Envirotech, FLE No-696), OVS Sampler (Envirotech FLE-722)

Analysis Report

S. No.	Parameters	Test Results	NAAQS	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	98.88	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	126.44	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	8.44	5	FL/SOP/GC-46
4	Toluene, µg/m ³	18.52	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	38.99	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	32.78	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND,[DL- 0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND,[DL- 0.5]	1	Method of Air- Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)

FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Do Not Conform** to NAAQS 2009. Except for **Benzo (a) Pyrene** Value.

WORK PLACE AIR QUALITY MONITORING AT WPAQ1

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 11:45 AM to 11:45 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab 14112 Warehouse
Sampling Location	: WPIAQ- 001 (Near Panel area)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.77
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N30.53214, E76.04254
Temperature (°C)	: 34
Equipment Used Details	: Fine Particulate Sampler(Envirotech, FLE No-717 & 697),CO Analyzer(Ecotech FLE- 149) OVS Sampler (Envirotech, FLE-723)

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	89.55	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	136.82	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	0.74	1	10	FL/SOP/GC-46
4	Toluene, ppm	8.10	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	6.69	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	15.44	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	0.088	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	3.66	50	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

WORK PLACE AIR QUALITY MONITORING AT WPAQ2

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 11:45 AM to 11:45 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab 14112 Warehouse
Sampling Location	: WPAQ- 002 (Wood storage area)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.76
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N30.53214, E76.04254
Temperature (°C)	: 34
Equipment Used Details	: Fine Particulate Sampler (Envirotech, FLE No-696 & 698), CO Analyzer, OVS Sampler (Envirotech, FLE-722)

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	79.84	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	110.12	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	0.68	1	10	FL/SOP/GC-46
4	Toluene, ppm	6.42	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	14.12	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	24.88	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	ND[DL-0.02]	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	3.45	50		FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

WORK PLACE AIR QUALITY MONITORING AT WPAQ3

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 11:45 AM to 11:45 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab 14112 Warehouse
Sampling Location	: WPAQ- 003 (Loading Point)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.65
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N30.53214, E76.04254
Temperature (°C)	: 34
Equipment Used Details	: Fine Particulate Sampler (Envirotech, FLE No-720 & 718), CO Analyzer, OVS Sampler (Envirotech, FLE-721)

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	42.23	NA	NA	NA
4	Particulate matter (PM ₁₀), µg/m ³	92.14	NA	NA	NA
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	0.65	1	10	10
4	Toluene, ppm	15.10	200	100	100
5	p-Xylene, ppm	26.54	100	100	100
6	o-Xylene, ppm	31.36	100	100	100
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	100
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	ND[DL-0.02]	0.2	NA	NA
9	Carbon Monoxide (as CO), mg/m ³	4.86	50	40	FL/SOP/GC-25

WORK PLACE AIR QUALITY MONITORING AT WPAQ4

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 15/08/2021 to 16/08/2021
Time of Sampling	: 11:45 AM to 11:45 AM
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab 14112 Warehouse
Sampling Location	: WPAQ- 004 (Backside of Reactor)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.81
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC) :	1
Longitude & Latitude	: N30.53214, E76.04254
Temperature (°C)	: 34
Equipment Used Details	: Fine Particulate Sampler (Envirotech, FLE No-138 & 711), CO Analyzer, OVS Sampler (Envirotech, FLE-721)

Analysis Report

S. No.	Parameters	Test Results	OSHA 3430-04:2011 Standards*	Indian Factory Act, 1948	Test Method
Air Analysis:					
3	Particulate matter (PM _{2.5}), µg/m ³	110.05	NA	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	172.94	NA	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)					
3	Benzene, ppm	0.84	1	10	FL/SOP/GC-46
4	Toluene, ppm	20.14	200	100	FL/SOP/GC-46
5	p-Xylene, ppm	33.10	100	100	FL/SOP/GC-46
6	o-Xylene, ppm	19.12	100	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND, [DL-0.02]	100	100	FL/SOP/GC-46
Other Parameters					
8	Benzo (a) Pyrene, mg/m ³	0.089	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	6.44	50	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

ANALYSIS OF TYRE PYROLYSIS OIL

Sample Particulars:

Nature of the Sample	: Tyre Pyrolysis Oil
Sample Quantity & Packaging	: 4X1Litre, Tin Bottle
Test Started On	: 16/08/2021
Test Completed On	: 23/08/2021
Method of Sampling	: Random Sampling
Company Location	: Tirath Ram and co Macchiwara Link Rd, Kohara, Punjab, 14112 Warehouse
Ambient Temperature (°C)	: 34
Sample Collected By	: FARE Labs Representative

S. No.	Parameter	Test Result	*Maximum Permissible limits	Protocol
1	Density, Kg/L	0.943	#NS	IS-1448:P-16
2	Kinematic Viscosity @ 40°C , cSt	5.19	NS	IS-1448:P-25
3	Flash Point, °C	54	NS	IS-1448:P-21
4	Sulphur Content, % wt.	1.28	4.5	IS-1448:P-33
5	Conradson Carbon Residue (10% residue), % wt.	3.41	NS	IS-1448:P-122
6	Water Content, % wt.	0.14	1	ISO-12937
7	Total Halogens, ppm	146.27	4000	USEPA Method-9076
8	Carbon Number	C ₈ -C ₃₀	NS	FL/SOP/GC-97
9	Acidity on Burning Tip, mgKOH/g	0.167	NS	ISO 6618
10	Boiling Range, °C	66.4 to 312	NS	IS-1448: P-18
11	Ash Content, % wt.	0.087	NS	IS-1448: P-4
12	Pour Point, °C	-8	NS	IS-1448:P-10
13	PONA (Paraffin, Olefins, Naphtha, Aromatics), % volume	69.53	NS	FL/SOP/GC-98
14	Calorific Value, Kcal/kg	9926.38	NS	IS-1448:P-6
15	Sediments, % wt.	0.0063	0.25	IS-1448:P-30
16	Lead, ppm	ND, [LOQ-0.3]	100	USEPA Method-3031
17	Cadmium, ppm	ND, [LOQ-0.3]	500	USEPA Method-3031
18	Chromium, ppm	ND, [LOQ-0.3]		USEPA Method-3031
19	Nickel, ppm	ND, [LOQ-0.3]		USEPA Method-3031
20	Arsenic, ppm	ND, [LOQ-0.3]	5	USEPA Method-3031
21	Polyaromatic Hydrocarbons (PAHs), % wt.	0.21	6	FL/SOP/HPLCP-31
22	Polychlorinated biphenyls (PCBs), ppm	BLQ , [LOQ-0.01]	2	FL/SOP/GCMS/P-04

NOTE:#NS=Not Specified, ND = Not Detected, LOQ=Limit of Quantification, BLQ=Below limit of quantification, FL/SOP/GCMS/P-04 based on AOAC 2007.01.

Maximum Permissible limits as per Schedule V (Part-B), Specifications of fuel derived from waste oil, [Hazardous and other Wastes \(Management & Trans boundary Movement\) Rules, 2016](#).



PUNJAB POLLUTION CONTROL BOARD

Zonal Office-1 Ludhiana

Website:- www.ppcb.gov.in

Office Dispatch No :	Registered/Speed Post	Date:
Industry Registration ID: R18LDH1207196		Application No : 8772198

To,

Avneet Singla
Tirath Ram and Co.(Unit-II), Kum Khurad ,Sub Tehsil Kum Kalan ,Teh. Ludhiana
Ludhiana,Punjab-141127

Subject: Grant of 'Consent to Establish'(NOC) for an industrial unit u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981.

With reference to your application for obtaining fresh 'Consent to Establish'(NOC) an industrial plant u/s 25 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, you are, hereby, permitted to establish the industrial unit to discharge the effluent(s) & emission(s) arising out of your premises subject to the Terms and Conditions as specified in this Certificate.

1. Particulars of Consent to Establish (NOC) granted to the Industry

Certificate No.	CTE/Fresh/LDH1/2019/8772198
Date of issue :	03/01/2019
Date of expiry :	02/01/2020
Certificate Type :	Fresh

2. Particulars of the Industry

Name & Designation of the Applicant	Avneet Singla, (Sole Prop.)
Address of Industrial premises	Tirath ram and co.(unit-ii), Village kum khurad(h.b.no.199),kum kalan,tehsil and distt. ludhiana, Ludhiana east,Ludhiana i-141127
Capital Investment of the Industry	114.0 lakhs
Category of Industry	Red
Type of Industry	1082-Pyrolysis Plants
Scale of the Industry	Small
Office District	Ludhiana i
Consent Fee Details	Rs. 9500/- for by way of DD no. 983227 dated 15.06.2018 in favor of Member Secretary, Punjab Pollution Control Board. Adequate for one year
Raw Materials (Name with quantity per day)	Waste/Condemned Plastic/ Rubber Tyres @ 10 Metric Tonnes/Day
Products (Name with quantity per day)	Pyrolysis Oil @ 3.5 Metric Tonnes/Day

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By-Products, if any,(Name with quantity per day)	Carbon Black @ 4 Metric Tonnes/Day. Light Fuel Gas/ hydro carbon gas @ 2 Metric Tonnes/Day Wax @ 0.5 Metric Tonnes/Day Steel Wire @ 2 Metric Tonnes/Day
Details of the machinery and processes	As per application form
Details of the Effluent Treatment Plant	The industry has proposed to provide septic tank for the treatment of domestic effluent & re-circulation arrangements for cooling water.
Mode of Disposal of Effluent	Only domestic effluent @ 0.8 KLD- Onto land for plantation area along the boundary wall and within the plant
Standards to be achieved under Water (Prevention & Control of Pollution) Act, 1974	As prescribed by the Board/MoEF & CC
Sources of emissions and type of pollutants	Process emission.
Mode of disposal of emissions with stack height	Stack of height 100 ft above ground level will be provided to disperse the flue gas emissions & process emissions.
Quantity of fuel required in TPD	Pyrolytic Gases @ 1 TPD & WOOD @ 400 Kg/Hour
Type of Air Pollution Control Devices to be installed	The industry has proposed to provide common Alkali Scrubber as APCD.
Standards to be achieved under Air (Prevention & Control of Pollution) Act, 1981	As prescribed by the Board/MoEF & CC



Om Parkash

03/01/2019

**(Om Parkash)
Environmental Engineer**

For & on behalf
of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Regional Office-1, Ludhiana

Om Parkash

03/01/2019

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(Om Parkash)
Environmental Engineer
For & on behalf
of
(Punjab Pollution Control Board)



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A. GENERAL CONDITIONS

1. The industry shall apply for consent of the Board as required under the provision of Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981 & Authorization under Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, two months before the commissioning of the industry.
2. The industry shall provide adequate arrangements for fighting the accidental leakages/ discharge of any air pollutant/gas/liquids from the vessels, mechanical equipments etc. which are likely to cause environmental pollution.
3. The Industry shall apply for further extension in the validity of the CTE atleast two months before the expiry of this CTE, if applicable.
4. The industry shall comply with any other conditions laid down or directions issued by the Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Air (Prevention & Control of Pollution) Act,1981 from time to time.
5. The project has been approved by the Board from pollution angle and the industry shall obtain the approval of site from other concerned departments, if need be.
6. The industry shall get its building plans approved under the provisions of section 3-A of Punjab Factory Rules, 1952.
7. The industry shall put up display board indicating the Environment data in the prescribed format at the main entrance gate.
8. The industry shall provide port-holes, platforms and/or other necessary facilities as may be required for collecting samples of emissions from any chimney, flue or duct or any other outlets.

Specifications of the port-holes shall be as under:-

- i) The sampling ports shall be provided atleast 8 times chimney diameter downstream and 2 times upstream from the flow disturbance. For a rectangular cross section the equivalent diameter (De) shall be calculated from the following equation to determine upstream, downstream distance:-

$$De = 2 LW / (L+W)$$
 Where L= length in mts. W= Width in mts.
 - ii) The sampling port shall be 7 to 10 cm in diameter
9. The industry shall discharge all gases through a stack of minimum height as specified in the following standards laid down by the Board.

(i) Stack height for boiler plants

S.NO.	Boiler with Steam Generating Capacity	Stack heights
1.	Less than 2 ton/hr.	9 meters or 2.5 times the height of neighboring building which ever is more
2.	More than 2 ton/hr. to 5 ton/hr.	12 meters
3.	More than 5 ton/hr. to 10 ton/hr	15 meters
4.	More than 10 ton/hr. to 15 ton/hr	18 meters
5.	More than 15 ton/hr. to 20 ton/hr	21 meters
6.	More than 20 ton/hr. to 25 ton/hr.	24 meters
7.	More than 25 ton/hr. to 30 ton/hr.	27 meters
8.	More than 30 ton/hr.	30 meters or using the formula $H = 14 Qg^{0.3}$ or $H = 74 (Qp)^{0.24}$ Where Qg = Quantity of SO2 in Kg/hr. Qp = Quantity of particulate matter in Ton/day.

Note : Minimum Stack height in all cases shall be 9.0 mtr. or as calculated from relevant formula whichever is more.

(ii) For industrial furnaces and kilns, the criteria for selection of stack height would be based on fuel used for the corresponding steam generation.

(iii) Stack height for diesel generating sets:

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Capacity of diesel generating set	Height of the Stack	
0-50 KVA	Height of the building	+ 1.5 mt
50-100 KVA	-do-	+ 2.0 mt.
100-150 KVA	-do-	+ 2.5 mt.
150-200 KVA	-do-	+ 3.0 mt.
200-250 KVA	-do-	+ 3.5 mt.
250-300 KVA	-do-	+ 3.5 mt.

For higher KVA rating stack height H (in meter) shall be worked out according to the formula:

$$H = h + 0.2 (KVA)^{0.5}$$

where h = height of the building in meters where the generator set is installed.

10. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.
11. The industry shall put up canopy on its DG sets and also provide stack of adequate height as per norms prescribed by the Board and shall ensure the compliance of instructions issued by the Board vide office order no. Admin./SA-2/F.No.783/2011/448 dated 8/6/2010.
 - (i) Once in Year for Small Scale Industries.
 - (ii) Four in a Year for Large/Medium Scale Industries.
 - (iii) The industry will submit monthly reading/ data of the separate energy meter installed for running of effluent treatment plant/re-circulation system to the concerned Regional Office of the Board by the 5th of the following month.
12. The industry shall provide flow meters at the source of water supply, at the outlet of effluent treatment plant and shall maintain the record of the daily reading and submit the same to the concerned Regional Office by the 5th day of the following month.
13. The industry shall make necessary arrangements for the monitoring of stack emissions and shall get its emissions analyzed from lab approved / authorized by the Board:-
 - (i) Once in Year for Small Scale Industries.
 - (ii) Twice/thrice/four time in a Year for Large/Medium Scale Industries.
14. The pollution control devices shall be interlocked with the manufacturing process of the industry.
15. The Board reserves the right to revoke this "consent to establish" (NOC) at any time, in case the industry is found violating any of the conditions of this "consent to establish" and/or the provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 as amended from time to time.
16. The industry shall plant minimum of three suitable varieties of trees at the density of not less than 1000 trees per acre along the boundary of the industrial premises.
17. The issuance of this consent does not convey any property right in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Central, State or Local Laws or Regulations.
18. The consent does not authorize or approve the construction of any physical structures or facilities for undertaking of any work in any natural watercourse.
19. Nothing in this NOC shall be deemed to neither preclude the institution of any legal action nor relieve the applicant from any responsibilities, liabilities or penalties to which the applicant is or may be subjected under this or any other Act.
20. The diversion or bye pass of any discharge from facilities utilized by the applicant to maintain compliance with the terms and conditions of this consent is prohibited except.
 - (i) Where unavoidable to prevent loss of life or some property damage or
 - (ii) Where excessive storm drainage or run off would damage facilities necessary for compliance with terms and conditions of this consent. The applicant shall immediately notify the consent issuing authority in writing of each such diversion or bye-pass.
21. The industry shall ensure that no water pollution problem is created in the area due to discharge of effluents from its industrial premises.

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22. The industry shall comply with the conditions imposed if any by the SEIAA/MOEF in the Environmental Clearance granted to it as required under EIA notification dated 14/9/06, if applicable.
23. The industry shall earmark a land within their premises for disposal of boiler ash in an environmentally sound manner, and / or the industry shall make necessary arrangements for proper disposal of fuel ash in a scientific manner and shall maintain proper record for the same, if applicable.
24. The industry shall obtain and submit Insurance cover as required under the Public Liability Insurance Act, 1991.
25. The industry shall submit a site emergency plan approved by the Chief Inspector of Factories, Punjab as applicable.
26. The industry shall provide proper and adequate air pollution control arrangements for control emission from its coal/fuel handling area, if applicable.
27. The Industry shall comply with the code of practice as notified by the Government / Board for the type of Industries where the siting guidelines / code of practice have been notified
28. Solids, sludge, filter backwash or other pollutant removed from or resulting from treatment or control of waste waters shall be disposed off in such a manner so as to prevent any pollutants from such materials from entering into natural water.
29. The industry shall submit a detailed plan showing therein, the distribution system for conveying wastewaters for application on land for irrigation along with the crop pattern to be adopted throughout the year.
30. The industry shall not irrigate the vegetable crops with the treated effluents which are used/ consumed as raw.
31. The industry shall ensure that its production capacity & quantity of trade effluent do not exceed the quantity mentioned in the NOC and shall not carry out any expansion without the prior permission/NOC of the Board.
32. All amendments/revisions made by the Board in the emission/stack height standards shall be applicable to the industry from the date of such amendments/revisions.
33. The industry shall not cause any nuisance/traffic hazard in vicinity of the area.
34. The industry shall maintain the following record to the satisfaction of the Board :-
 - (i) Log books for running of air pollution control devices or pumps/motors used for it.
 - (ii) Register showing the result of various tests conducted by the industry for monitoring of stack emissions and ambient air.
 - (iii) Register showing the stock of absorbents and other chemicals to be used for scrubbers.
35. The industry shall ensure that there will not be significant visible dust emissions beyond the property line.
36. The industry shall establish sufficient number of piezometer wells in consultation with the concerned Regional Office, of the Board to monitor the impact on the Ground Water Quantity due to the industrial operations, if applicable.
37. The industry shall provide adequate and appropriate air pollution control devices to contain emissions from handling, transportation and processing of raw material & product of the industry



03/01/2019

(Om Parkash)
Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

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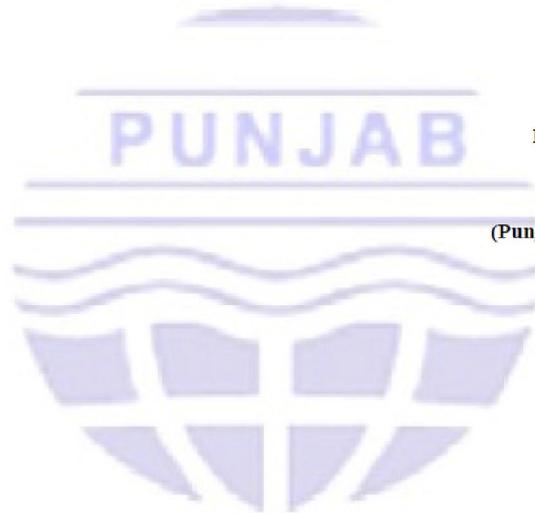
Tirath ram and co. (unit-ii), Village kum khurad(h.b.no.199),kum kalan,tehsil and distt. Ludhiana,Ludhiana east,Ludhiana i,141127

Page6

B. SPECIAL CONDITIONS

Specific Conditions:

1. The industry will comply with the siting guidelines, code of practice & pollution abatement measures to be adopted by such units as mentioned in the orders issued by Govt. of Punjab vide no.10/46/2014-STE(5)/325543 dated 15.10.2014.
2. The industry shall not generate or discharge any kind of trade effluent from its premises.
3. The industry shall comply with the conditions as mentioned in the Approval of site clearance issued vide letter no. 8703 dated 25.09.2018 by Department of Labour Govt. of Punjab, in true letter & spirit.
4. The industry shall install the pollution control device simultaneously along with the main project as per feasibility report submitted by the industry.
5. The industry will not start its operation before obtaining consent to operate of the Board as required under the provisions of Water (Prevention & Control of Pollution) Act,1974 & Air(Prevention & Control of Pollution) Act,1981.
6. The industry shall comply with the guidelines of the Central Ground Water Authority for abstraction of ground water.
7. The industry shall comply with the stipulations of the CLU granted by the Senior Town Planner Ludhiana vide letter 2807 dated 06.06.2018.



Om Parkash

03/01/2019

**(Om Parkash)
Environmental Engineer**

For & on behalf

of

(Punjab Pollution Control Board)

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PUNJAB POLLUTION CONTROL BOARD

Zonal Office-I, E-648-B, Focal Point, Phase-5, Ludhiana

Website:- www.ppcb.gov.in

Office Dispatch No :

Registered/Speed Post

Date:

Industry Registration ID: R18LDH1207196

Application No : 14188587

To,

Avneet Singla
Tirath Ram And Co.(unit-ii), Kum Khurad ,sub Tehsil Kum Kalan ,teh. Ludhiana
Ludhiana,Punjab-141127

Subject: Renewal in validity of consent to operate granted under Air (Prevention & Control of Pollution) Act, 1981.

1. Particulars of Consent to Operate under Air Act, 1981 granted to the industry

Consent to Operate Certificate No.	CTOA/Renewal/LDH1/2021/14188587
Date of issue :	13/01/2021
Date of expiry :	30/06/2025
Certificate Type :	Renewal
Previous CTO No. & Validity :	CTOA/Fresh/LDH1/2019/10983208 From: 24/09/2019 To: 23/09/2020

2. Particulars of the Industry

Name & Designation of the Applicant	Avneet Singla, (Sole Prop.)
Address of Industrial premises	Tirath Ram And Co.(unit-ii), Village Kum Khurad(h.b.no.199),kum Kalan,tehsil And Distt. Ludhiana, Ludhiana East,Ludhiana I-141127
Capital Investment of the Industry	149.15 lakhs
Category of Industry	Red
Type of Industry	1082-Pyrolysis Plants
Scale of the Industry	Small
Office District	Ludhiana I

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Page1

All the other contents and conditions of consent will remain same as mentioned in original consent no. CTOA/Fresh/LDH1/2019/10983208 dated 24.09.2019 valid upto 23.09.2020 granted under Air (Prevention & Control of Pollution) Act, 1981.



13/01/2021

(Ravinder Bhatti)
Environmental Engineer

For & on behalf
of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office-1, Ludhiana for information and necessary action.



13/01/2021

(Ravinder Bhatti)
Environmental Engineer

For & on behalf
of

(Punjab Pollution Control Board)

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Tirath Ram And Co.(unit-ii), Village Kum Khurad(h.b.no.199),kum Kalan,tehsil And Distt. Ludhiana,Ludhiana East,Ludhiana I,141127

Page2



PUNJAB POLLUTION CONTROL BOARD
Zonal Office-I, E-648-B, Focal Point, Phase-5, Ludhiana
Website:- www.ppcb.gov.in

Office Dispatch No : _____ Registered/Speed Post _____ Date: _____
Industry Registration ID: *R18LDH1207196* Application No : *14189340*

To,

Avneet Singla
Tirath Ram And Co.(unit-ii), Kum Khurad ,sub Tehsil Kum Kalan ,teh. Ludhiana
Ludhiana,Punjab-141127

Subject: Renewal in validity of consent to operate granted under Water (Prevention & Control of Pollution) Act, 1974.

1. Particulars of Consent to Operate under Water Act, 1974 granted to the industry

Consent to Operate Certificate No.	<i>CTOW/Renewal/LDH1/2021/14189340</i>
Date of issue :	<i>13/01/2021</i>
Date of expiry :	<i>30/06/2025</i>
Certificate Type :	<i>Renewal</i>
Previous CTO No. & Validity :	<i>CTOW/Fresh/LDH1/ 2019/10983444</i> <i>From: 24/09/2019 To: 23/09/2020</i>

2. Particulars of the Industry

Name & Designation of the Applicant	<i>Avneet Singla, (Sole Prop.)</i>
Address of Industrial premises	<i>Tirath Ram And Co.(unit-ii), Village Kum Khurad(h.b.no.199),kum Kalan,tehsil And Distt. Ludhiana, Ludhiana East,Ludhiana I-141127</i>
Capital Investment of the Industry	<i>149.15 lakhs</i>
Category of Industry	<i>Red</i>
Type of Industry	<i>1082-Pyrolysis Plants</i>
Scale of the Industry	<i>Small</i>
Office District	<i>Ludhiana I</i>

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Page1

SPECIAL CONDITIONS:-

1. The industry does not generate any trade effluent and shall discharge only domestic effluent onto land for plantation after septic tank.

All the other contents and conditions of consent will remain same as mentioned in original consent no. CTOW/Fresh/LDH1/2019/10983444 dated 24.09.2019 valid upto 23.09.2020 granted under Water (Prevention & Control of Pollution) Act, 1974.



13/01/2021

(Ravinder Bhatti)
Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

Endst. No.:

Dated:

A copy of the above is forwarded to the following for information and necessary action please:

Environmental Engineer, Punjab Pollution Control Board, Regional Office-1, Ludhiana for information and necessary action.



13/01/2021

(Ravinder Bhatti)
Environmental Engineer

For & on behalf

of

(Punjab Pollution Control Board)

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Tirath Ram And Co. (unit-ii), Village Kum Khurad (h.b.no.199), kum Kalan, tehsil And Distt. Ludhiana, Ludhiana East, Ludhiana I, 141127

Page 2

Director of Factories, Punjab
Kirat Bhawan(Model Welfare Centre) Near 10-11 Lights
Sec 64 (Phase 10),S.A.S Nagar (Mohali),Pin-160062

To

M/s Tirath Ram and Co Unit 2,
Raipur Bet Road,Village Kum Khurd Sub Tehsil Kum K
Kum Khurd . Punjab (India)

DOF190828458

Date: 28/08/2019

File No.: 20190786595

Subject: Acceptance of Existing Factory Building Plans under section-6 Factories ACT 1948 and Rule 3-A of Punjab Factories Rules 1952.

The Existing building plans of M/s. Tirath Ram and Co Unit 2(Raipur Bet Road,Village Kum Khurd, Tehsil Kum K, Kum Khurd, Punjab (India)), have been found correct in accordance with the provisions of (Rule 3-A) of the Punjab Factories Rule, 1952 & got accepted under Factories Act, 1948 by the Chief Inspector of Factories, Punjab, subject to the following conditions: -

1. Amended Factory Building Plans shall be submitted to Chief Inspector of Factories, Punjab in case any change in area, building, plant & machinery and manufacturing process in future.
2. Applicant shall obtain any other permission required under building bye-law of Housing Department of Punjab Land Authority or any other Act at his own.
3. The Building Cess Rs. 30100.00 has been deposited by the applicant under the Building & other construction worker's Welfare Cess Act, 1996. However, the applicant shall deposit the difference of amount, if any, found at any point of time.
4. The occupier shall submit form no. 1-F (Stability Certificate for building revised building and after expiry of 7 years) after the completion of building and installation of plant and machinery duly certified by the Competent Person.
5. The occupier shall submit the application in Form No.2 to get Factory Licence after the completion of plant and machinery before start of manufacturing process.

This is computer generated report.


For Chief Inspector of Factories, Punjab

Harish Gupta

FACTORY BUILDING PLAN OF M/S TIRATH RAM & CO.(UNIT-2)
RAIPUR BET ROAD VILLAGE KUM KHURD SUB TEHSIL KUM KALAN
DISTT.LUDHIANA

Area Occupied By Machinery—

1.Reactor	20'x10'	=	200 Sft
2.Condencer	2'Ø	=	6 Sft
3.P.yrolysis Oil Tank	3x3'x5'	=	45 Sft
4.Condencer	3'x5'	=	15 Sft
5.APCD	2'Ø	=	6 Sft
6.I.D Fan	2'x1'	=	2 Sft
7.Compress M/C	5'x3'	=	15 Sft
8.Tyre Cutting M/C	5'x3'	=	15 Sft
9.Wire Remover M/C	5'x3'	=	15 Sft
10.Condencer	5x2'Ø	=	30 Sft

For Tirath Ram & Co. (Unit-II)

Anand Singh
Authorised Signatory

Hanish
HANISH GUPTA 19/7/19
Competent Person
Director of Factories, Punjab
SANGRUR (Po.)

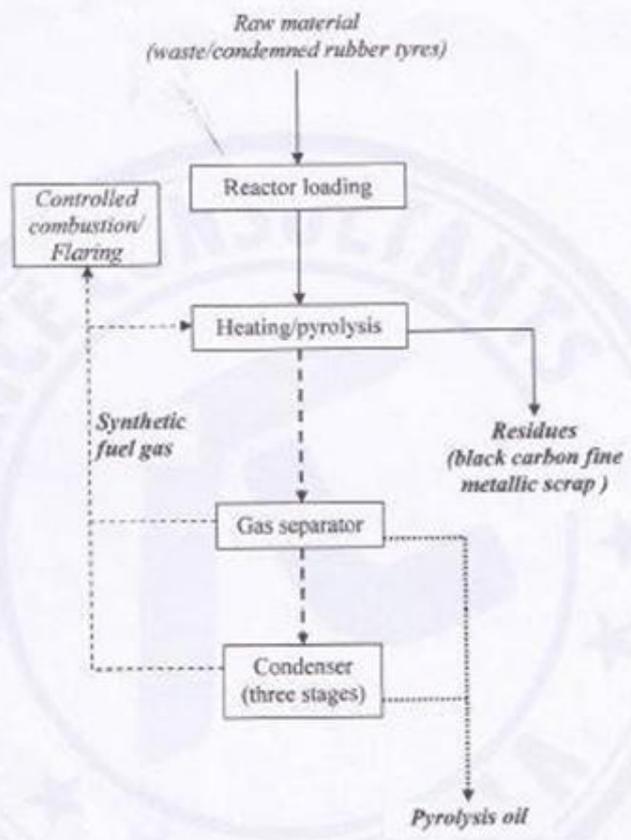


Figure 1: Schematic of overall manufacturing process

Hanish
HANISH GUPTA
 Competent Person
 Director of Factories, Punjab
 SANGRUR (Pb.)

Tirath Ram & Company (Unit-2), Ludhiana (Punjab)

For Tirath Ram & Co. (Unit-II)
Anand Singh
 Authorised Signatory

FORM No. 1-F

(See Rule-4)

ਦੇਸ਼ੀ ਕਾਰੋਬਾਰ / ਪ੍ਰੋਦਾਨ
28/7/19
ਪ੍ਰੀਤ ਕਾਮ ਕੁਰਦ ਅਤੇ ਕੋਲ ਕਾਲਨ
ਪ੍ਰੀਤ ਕਾਮ ਕੁਰਦ ਅਤੇ ਕੋਲ ਕਾਲਨ
ਲੁਧਿਆਣਾ

- 1 Name of the factory : M/S Tirath Ram & Co. (Unit - 2)
- 2 Village, Town and district in Which the factory is situated : Vill. Kum Khurd Sub Tehsil Kum Kalan Distt. Ludhiana
- 3 Full postal address of the factory : M/S Tirath Ram & Co. (Unit - 2), Raipur Bet Road, Vill. Kum Khurd Sub Tehsil Kum Kalan Distt. Ludhiana
- 4 Name of the occupier of the factory : Avneet Singla
- 5 Nature of Manufacturing process to be carried on in the factory : Pyrolysis Oil
- 6 Number of floors on which workers will be employed. : Ground Floor

I certify that I have inspected the buildings plans of which have been attached and examined the various parts including the foundations with special reference to the machinery, plant, etc. that have been installed. I am of the opinion that the buildings which have been constructed are in accordance with the plans attached that they are structurally sound and that their use as a factory for the manufacture of Pyrolysis Oil for which the machinery, plant etc. installed is intended.

Signature *Hanish Gupta*
Qualification **HANISH GUPTA**
Competent Person
Address **Director of Factories, Punjab**
SANGRUR (Pb.)

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Raj Singh
2.	Age/ Gender	32 / Male
3.	Address /Contact number	Vill :- Kumkhard kumkalam Tehsil/District - Ludhiana +91 87 28888 - 582
4.	Proximity of person from unit	2 KM
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All good nenny health, dust, and odour problem.

Date 16/08/2021

Place Vill :- Kumkhard kumkalam
Tehsil/District - Ludhiana

16/08/2021
Arun Chahal (Manager)
Name & designation of inspecting officer
FAREHAST
L-17/3
DLF Ph-II
GURGAON

-6/8-

Arun Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Ram Singh .
2.	Age/ Gender	40 / male
3.	Address /Contact number	Vill:- Kum Khurd, Kumkalan. Tehsil/District - Ludhiana. +91 9876124233
4.	Proximity of person from unit	2 KM .
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All good no any health, dust, odour problem .

Date 16/08/2021

Place Vill - Kum Khurd / Kumkalan
Tehsil / District - Ludhiana .

16/08/2021
Arun Chetani (Manager)
Name & designation of Inspecting officer



-6/8-

Arun Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Chamko Singh
2.	Age/ Gender	45/Male
3.	Address /Contact number	Vill - Kum Khurd / Kum Kalan Tehsil/District - Ludhiana, +91 7380147616
4.	Proximity of person from unit	2 km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All Good no any health issues and no any odour dust problems

Date 16/08/2021

Place Vill - Kum Khurd, Kum Kalan
Tehsil / District :- Ludhiana.

Am
16/08/2021
Apur Chaturvedi (Manager)
Name & designation of inspecting officer
LABS
L-17/3
DLF Ph-II
GURGAON

-6/8-

Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Kesal Singh
2.	Age/ Gender	45 / Male
3.	Address /Contact number	Vill:- Kumbkalan, Khurd Tehsil/District - Ludhiana. +91 8194854 - 313
4.	Proximity of person from unit	2 KM
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	—
6.	Specify if the person has any Health issue. Also mention duration	—
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All good no any Odour or dust problems.

Date 16/08/2021

Place Vill :- Kumbkalan,
Kumbkalan, Tehsil / District - Ludhiana.

Name & designation of inspecting officer

Amrinder Singh
16/08/2021
Amrinder Singh (Narej)
L-17/3,
DLF Ph.-II
GURGAON

-6/8-

Amrinder Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Himant Singh
2.	Age/ Gender	30/ Male
3.	Address /Contact number	Vill - Kum khurd, +919872499632 Kumkalan, Tehsil/District - Ludhiana
4.	Proximity of person from unit	2 KM
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	-
6.	Specify if the person has any Health issue. Also mention duration	-
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	All good no any problem Odour or dust.

Date - 16/08/2021

Place Vill: - Kum, Khurd Kumkalan
Tehsil/District - Ludhiana.

16/08/2021
Abun Chaturvedi (Manager)
Name & designation of inspecting officer
ABSP
L-17/3,
DLF Ph.-II
GURGAON LTD

-6/8-

Anand Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Kadeer
2.	Age / Gender	21
3.	Address /Contact Number	Plant Permisses +919634774289
4.	Designation	worker
5.	Work profile	Tyre cutting
6.	Working since how many years?	6 months
7.	Whether using PPE Kit	Yes used during working.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All good.
10.	In case of any health issues, specify duration of illness?	✓
11.	Any feedback	All is well.

Date 15/08/2021

Place M/s Tiraty Rem and Company
(Unit-II) Vill - Kumkhusud
Kum Kalam, Tehsil / District - Ludhiana

Am
15/08/2021
Arjun Chaturvedi (Muzam)
Name & designation of inspecting officer



-7/8-

Arav Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Shoukin
2.	Age / Gender	20
3.	Address /Contact Number	Plant premises +916995558783
4.	Designation	worker
5.	Work profile	Tyre cutting
6.	Working since how many years?	6 months
7.	Whether using PPE Kit	Yes used during working.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All good.
10.	In case of any health issues, specify duration of illness?	-
11.	Any feedback	All good. no issues. any

Date 15/08/2021

Place M/S Tirathy Ram and Company
(Dist - II) Vill:- Kum Khurd
Kum Kalam, Tehsil / District - Ludhiana.

Arjun Chaturvedi (Manager)
Name & designation of inspecting officer



-7/8-

Arund Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Krishna Yadav
2.	Age / Gender	35
3.	Address /Contact Number	Plant Premises. +91 8429964231
4.	Designation	Plant worker (Plant Head)
5.	Work profile	Overall plant Excavating
6.	Working since how many years?	4+ years
7.	Whether using PPE Kit	Yes used during plant visit
8.	Work duration ?	8-10 hrs
9.	Health condition (Details)	All good no any health issues
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	All fine.

Date 15/08/2021

Place M/S Tirath Kumar and Company
(Dist-II) Vill:- Kum khurd
Kum kalam Tehsil / District Ludhiana.

Arun Chaturvedi (Mopneshu)
Name & designation of inspecting officer
LABS
L-173,
DLF Ph.-II
GURGAON * I.T.D.

-7/8-

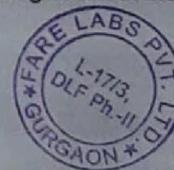
Arun Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Ram kishore
2.	Age / Gender	40
3.	Address /Contact Number	Plant premises +919026351309
4.	Designation	Worker
5.	Work profile	loading / unloading Tyre cutting.
6.	Working since how many years?	6 months
7.	Whether using PPE Kit	Yes used.
8.	Work duration ?	8-10 hrs.
9.	Health condition (Details)	All good.
10.	In case of any health issues, specify duration of illness?	-
11.	Any feedback	No. any health issue all good.

Date 15/08/2021
 Place M/S Tirath Ram and Company
 (Unit-II) Vill: - kum khurd
 kum kalam, Tehsil / District - Ludhiana.

Arun Chatterjee
 15/08/2021
 Arun Chatterjee (Manager)
 Name & designation of inspecting officer



-7/8-

Arav Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Motilal
2.	Age / Gender	42
3.	Address /Contact Number	Plant premises. +91 8175960717
4.	Designation	Plant worker
5.	Work profile	Type feeding to the reactor
6.	Working since how many years?	3 years
7.	Whether using PPE Kit	Yes used during working.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All good no any health issues.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	All good.

Date 15/08/201
 Place M/s Tiraty Ram and company
 (Unit-II) Vill:- Kum khurd
 Kum Kalan, Tehsil / District - Ludhiana

Amn
 15/08/201
 Aman Chatterjee (Manager)
 Name & designation of inspecting officer



-7/8-

Arav Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Rajesh Kumar
2.	Age / Gender	30
3.	Address /Contact Number	Plant premises. +91 8175960717
4.	Designation	worker
5.	Work profile	Loading / Tyre feeding to the reactor
6.	Working since how many years?	6 months
7.	Whether using PPE Kit	Yes used during working
8.	Work duration ?	8-10 hrs.
9.	Health condition (Details)	Good everything is fine. no any health problem.
10.	In case of any health issues, specify duration of illness?	-
11.	Any feedback	All good.

Date 15/08/2021

Place M/s Tirath Ram and Company
(Unit II) Vill:- kum khurd
kum kalan, Tehsil/ district - Ludhiana

Amr
Amr Chahal (Manager)
Name & designation of inspecting officer

-7/8-

Amr Kumar

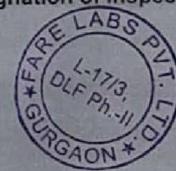
Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Raj Kumar
2.	Age / Gender	36
3.	Address /Contact Number	Plant premises. +918429964231
4.	Designation	Plant worker
5.	Work profile	Reactor Loading
6.	Working since how many years?	6 months.
7.	Whether using PPE Kit	Yes used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	Good. no any issues
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	All good no any issues.

Date 15/08/2021

Place M/S Tirath Ram and Company
(Unit-II) Vill: - kum khurd
kum kalan, Tehsil / District - Ludhiana.

Arun Chetwani (Manager)
Name & designation of inspecting officer



-7/8-

Arun Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Ram Milan
2.	Age / Gender	39
3.	Address /Contact Number	Plant premises / +91902635 - 1309
4.	Designation	Plant operator
5.	Work profile	machine operating during operation of plant.
6.	Working since how many years?	3 years
7.	Whether using PPE Kit	yes used.
8.	Work duration ?	8-10 hrs.
9.	Health condition (Details)	All good no new healthy issues.
10.	In case of any health issues, specify duration of illness?	-
11.	Any feedback	All Good,

Date 15/08/2021

Place MIS Tirath Ram and Company
(Unit - II) Vill:- kumkaurd
kumkalan, Tehsil / District - Ludhiana.

Arjun
15/08/2021
Arjun Chatterjee (Manager)
Name & designation of inspecting officer



-718-

Aravind Kumar

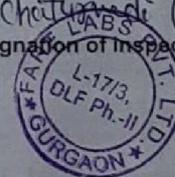
Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Gaggal
2.	Age / Gender	27
3.	Address /Contact Number	Plant Permises +9176200 - 0041
4.	Designation	Plant manager
5.	Work profile	Manage all activities i.e. plant operation.
6.	Working since how many years?	4+ years
7.	Whether using PPE Kit	Yes used when visit Plant Area.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	Good
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	All good, no any issue.

Date 15/08/2021

Place M/s Tirath Ram and Company
(Unit-II) Vill - Kum khurd
Kumkalan, Tehsil / District - Ludhiana

Arun Chaitanya
Name & designation of inspecting officer (Manager)



-7/8-

Arun Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Nayand
2.	Age / Gender	25
3.	Address /Contact Number	Plant Premises +918909519314
4.	Designation	Worker
5.	Work profile	Tyre cutting.
6.	Working since how many years?	6 month's
7.	Whether using PPE Kit	Yes used during working
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All good.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	No any issues all is well.

Date 15/08/2021
 Place M/S Tirath Ram and Company
 (Unit-II) Kumbhurd, Kumbhuran
 Tehsil/District: - Ludhiana.

15/08/2021
 Arun Chaturvedi (Manager)
 Name & designation of inspecting officer



Arav Kumar

PHOTOGRAPHS OF UNIT TAKEN AT THE TIME OF STUDY



Main gate



Waste tyre



Steel wire



Manual feeding



Wooden blocks for firing



Wet Scrubber



Reactor gate with temperature gauge



Condensors





Pyro gas flaring system



Chimney



Fire hydrant



DG Set



Collection of carbon Powder



Removal of steel wire

STUDY REPORT ON THE CONTINUOUS PYROLYSIS PROCESS AT M/s ROYAL CARBON BLACK PRIVATE LIMITED, KHALAPUR, RAIGAD, MAHARASHTRA.

1. Background:

Central Pollution Control Board, Regional Directorate, Pune, was directed to carry out the study at M/s Royal Carbon Black Pvt. Ltd., Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Village-Vanivali, Tal-Khalapur, Dist-Raigad, Maharashtra with the following study protocol;

- ❖ The monitoring to be carried out at both work place as well as in ambient environment for air quality with following parameters:
 - Work Place Monitoring (08 hourly): Respirable dust (PM₁₀, PM_{2.5}) CO, VOCs, Benzo(a)pyrene.
 - Ambient Air Quality Monitoring (24 hourly): PM₁₀, PM_{2.5}, VOCs, Benzo(a)pyrene.
- ❖ In case of batch process, monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of charcoal / fine carbon for comparison purpose.
- ❖ For ambient air quality, monitoring to be carried out for 8 hours during operation of the plant at two locations.
- ❖ Detailed analysis of tyre pyrolysis oil in terms of its sulphur content, calorific value, sediment, lead, arsenic, cadmium + chromium + nickel, PAH, Total halogens, PCBs and water content (as per schedule V part B of HoM rules 2016).
- ❖ Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be analyzed.
- ❖ Locations and numbers of sensors / alarms.
- ❖ Survey of minimum 10 persons in the adjoining areas (within 1 km radius) through questionnaire (draft questionnaire attached)
- ❖ Health assessment of workers through questionnaire (draft questionnaire attached)
- ❖ Any other parameter of interest if found to be useful during the study may also be included.

Accordingly, monitoring was carried out during 11 – 12 August, 2021 at the aforesaid unit-M/s Royal Carbon Black Pvt. Ltd., Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Village-Vanivali, Tal-Khalapur, Dist-Raigad, Maharashtra and sampling was carried out through a laboratory-M/s Bureau Veritas India Pvt. Ltd. recognized under the Environment (Protection) Act, 1986. Mr. Chalpathi Rao represented as team leader from the laboratory side during the sampling. The following officials participated during the same:

- (i) Shri Bharat K Sharma, Regional Director, Central Pollution Control Board (CPCB), Regional Directorate Pune, and;

(ii) Dr. K. V. George, Scientist & Head - APC Division, National Environmental Engineering Research Institute, Nagpur.

Dr. Anantha N S, Senior Scientific Assistant, CPCB, Regional Directorate Pune and other officials (Mr. Sachin Adkar, Sub-Regional Officer (SRO), MPCB, Raigad, Mr. Arvind Dapate, Field Officer (FO), MPCB, Raigad, Mr. Umesh Jadhav, FO, MPCB, Raigad) from Raigad Regional Office, Maharashtra Pollution Control Board, also participated during the studies. Sh. Vishesh Agarwal (Plant Owner) and Mr. Tushar Talekar (Plant Head) from the unit- M/s Royal Carbon Black Pvt. Ltd., were also present during the studies.

2. About the Industry:

M/s Royal Carbon Black Pvt. Ltd. is located in New Era Warehousing and Industrial Complex at Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Vanivali (Village), Khalapur (Taluk), Raigad (District), Maharashtra (18.8676762°N, 73.2059118°E). The Google Map showing location of the plant is given in **Fig. 1**.

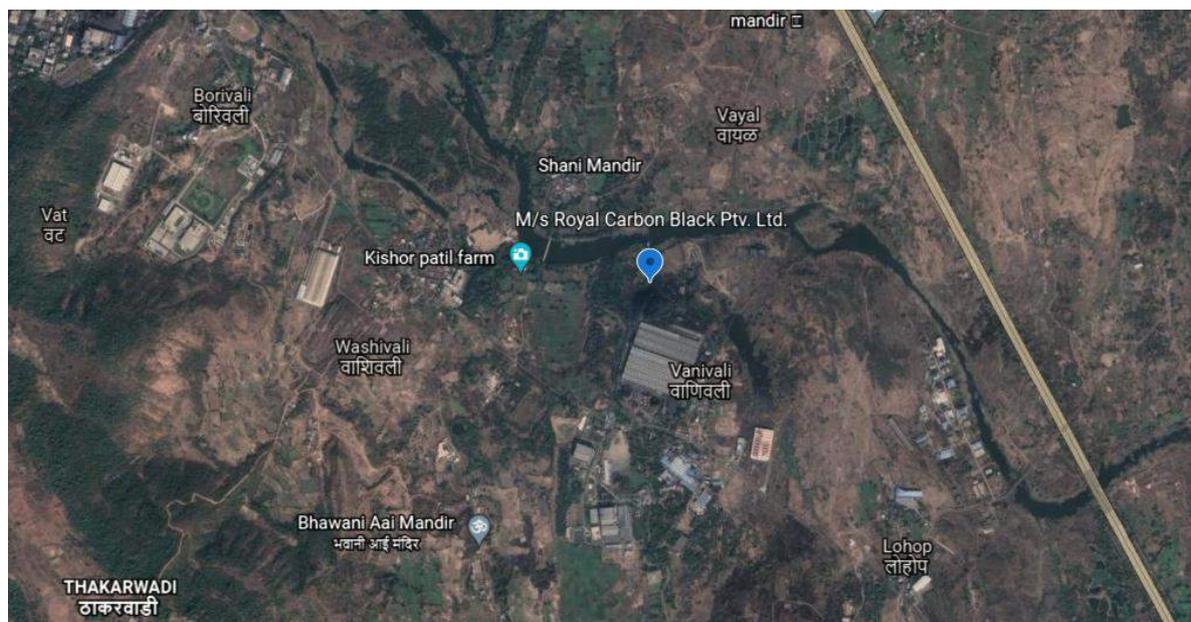


Fig. 1: Google Map showing location of M/s Royal Carbon Black Pvt. Ltd. Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Vanivali (Village), Khalapur (Taluk), Raigad (District), Maharashtra.

The unit is engaged in Tyre Waste pyrolysis and has been granted Consent to Operate under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 and authorization under Rule 6 of the Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016, by Maharashtra Pollution Control Board (MPCB) vide letter dated 01/08/2018 having validity till 31/03/2021. The unit started operation of its plant in 2010. Copy of the said Consent and Authorisation dated 03/06/2015 and 01/08/2018 are given at **Annexure – I & II**, respectively.

The unit has been granted Consent to Operate for manufacturing of the following:

Table 1: The Consent is valid for the manufacture of

No.	Product / By-Product Name	Maximum Quantity	UoM
1.	Bio-Fuel Oil		
a)	by means of Edible Oil	1650	MT/M
b)	by means of Fats	4000	MT/M
c)	by means of non-edible Oil	1650	MT/M
d)	by means of Algae	100	MT/M
e)	by means of Waste, paring & Scrap of Rubber (Pyrolysis)	9000	MT/M
2.	By-products		
a)	Glycerin / Carbon Black	900	MT/M

The consented daily quantity of sewage effluent from the industry is 8.0 m³.

3. Process description and Plant & Machineries:

Pyrolysis is a chemical reaction that involves molecular breakdown of larger molecules into smaller molecules at high temperatures in absence of air. Pyrolysis is also known as thermal cracking, cracking, thermolysis, depolymerization, etc. Tyre pyrolysis is the process of converting waste tyres into products / intermediates like pyrolysis oil, carbon black, steel scrap and hydrocarbon gas.

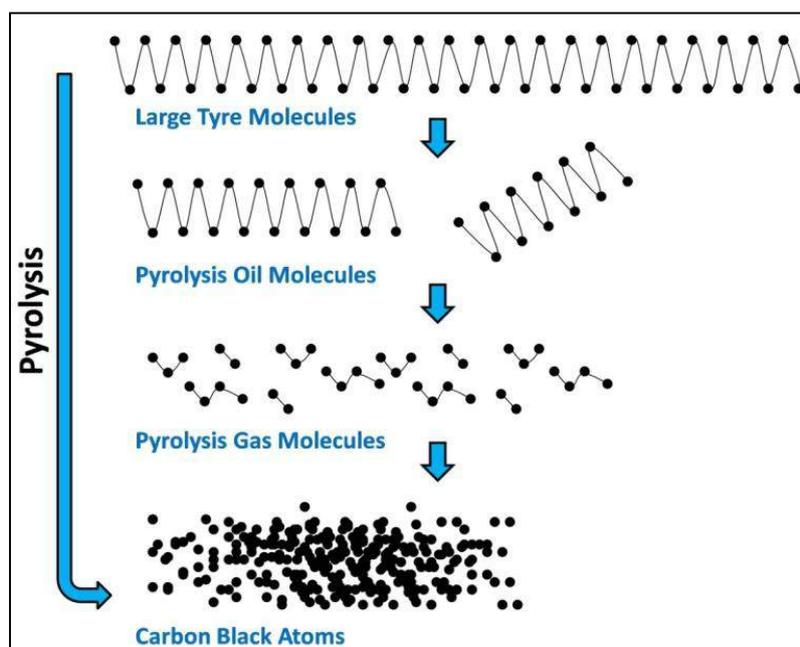


Fig. 2: Typical Pyrolysis Process

As informed by the unit representative, Tyre Crumbs of ~20 mm in size are received from local suppliers and stored at an open space (triangular area/tyre crumbs stock yard) within the premise. Water is sprayed on the crumbs and loaded onto a conveyer belt using a loader machine. Magnetic separators are provided at two locations of conveyer belt to collect steel wires from tyre crumbs. The conveyer belt drops the crumbs into hoppers (11.25 m³ or 05 MT capacity X 03 nos.) inside the pyrolysis shed and near to feed of the pyrolysis plant. The Z-conveyer belt connected to each hopper transfers the crumbs into an individual Automated Hopper (01 MT capacity). Each Automated Hopper is equipped with 02 nos. of screw feeders at the bottom. Each screw feeder is connected to a Tyre Pyrolysis Reactor (TPR).

The Automated Hopper is provided with 02 sensors, one at the top and one at the bottom to detect and maintain adequate quantity of crumbs inside the Automated Hopper to ensure continuous feed of crumbs to TPR. The feeding rate is controlled by the frequency of rotation of screw feeder, which is generally maintained at 18 Hz (equivalent to ~326 kg/hour to each reactor). Magnesium oxide, as a catalyst, is manually added at the entry of crumbs into the screw feeder system. It was informed that the conical shape of the end of the screw feeder system acts as an air lock arrangement and does not allow air to pass into the TPR. The schematic diagram of Continuous Tyre Pyrolysis unit is given in **Fig. 3**.

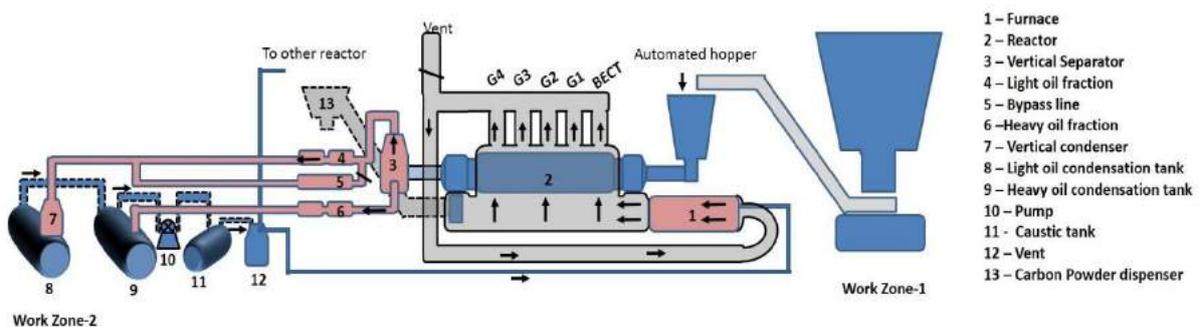


Fig. 3: Schematic diagram of Continuous Tyre pyrolysis unit.

M/s Royal Carbon Black Pvt. Ltd. has installed 03 nos. of tyre pyrolysis units and each unit has 02 nos. of TPR. The TPR is a rotary horizontal cylinder of diameter 1,200 mm and length 12,000 mm mounted on ground in an enclosure of insulating material. The enclosure has provision for passing hot air from bottom of the TPR. It was informed by the unit representative that

initial heating of TPR is done by firing light oil obtained as product from tyre pyrolysis and as the temperature of the furnace reaches 300°C, pyrolysis gases is also used in the furnace. Provision of both diesel burner and gas burner are provided in the furnace which generates hot air. The hot air from the furnace is passed under the TPR. Ducts (05 nos.) are provided at the top and along the length of the TPR enclosure through which hot air is re-circulated to the furnace for TPR heating. Temperature sensors are provided at each duct to detect the temperature of hot air emerging at the top of the TPR enclosure. As informed, in order to control the temperature of TPR, passing of hot air through one or more ducts is regulated by manually opening or closing the same.

Each individual reactor is connected to an automatic control panel that displays pressure, temperature, speed of rotation of reactor, feed rate (Hz), furnace temperature, etc. and each parameter is controlled by an operator in the control panel room. The reactor pressure is maintained between 50 to 200 Pa with the help of ventury type suction system driven by a centrifugal pump. The temperature of the furnace is maintained at around 660°C. The temperature of front end of the TPR is maintained at 150°C – 230°C and temperature of back end of the TPR is maintained at 450°C – 480°C during continuous pyrolysis process. When the temperature of pyrolysis reactor reaches beyond the said temperature, an ID Fan draws hot air which is subjected to a packed bed scrubbing system and released through a stack of 30 m height. The hot air re-circulating system of 03 TPRs is also connected with the said scrubbing system through a duct valve and the stack of 30 m height. There are 02 nos. of packed bed scrubbing systems for 06 TPRs.

The back end of TPR is connected to a vertical oil separator, where some of the pyrolysis gases may condense and collected as heavy oil fraction at the bottom of the vertical separator and rest of the uncondensed gases are subjected to condensation. There are two parallel condensation lines – one for Heavy oil fraction and another for Light oil fraction. Each of such lines have two horizontal condensers in series. The Light oil fraction line has an additional vertical condenser after the said horizontal condensers. The condensed oil is collected in Light Oil Condensation tank and Heavy oil Condensation tank separately. These two tanks are connected and uncondensed gas is used in its Furnace for hot air generation after passing through caustic tank to scrub the gas and also maintaining suction in the system.

Alternatively, the uncondensed gas is also channelized to Furnaces of other Reactors for hot air generation.

A by-pass condenser has also been installed after the Vertical Oil Separator parallel to the Light Oil fraction line and meets the said Light Oil fraction line before the aforesaid additional vertical condenser. It was informed that this by-pass condenser is used in case of choking of Light/Heavy oil condensers or other emergency. However, there is no vent or flaring arrangement for emergency escape of uncondensed pyrolysis gas. The unit operator claims that generation of uncondensed gas is used in the furnaces and also that such generation can be minimized as per the need with the regulation of cold water circulation in the condensers.

The oil from the condensation tanks are pumped to bigger oil storage tanks at the oil storage yard outside the pyrolysis shed. The Heavy Oil fraction is collected in horizontal tanks (90 kL capacity X 03 nos.) and light oil fraction is collected in vertical tanks (130 kL capacity X 03 nos.) at the oil storage yard.

Carbon powder produced from 04 Reactors (Reactor 1-4) of the 06 reactors are channelized to a common closed air tight screw conveyer, followed by an enclosed inclined screw conveyer that carries the carbon powder to a hopper equipped with air lock rotary valve situated on the North side of the pyrolysis shed. A magnetic separator is provided at the inclined screw conveyer to extract the steel wire from carbon powder. The said 04 Reactors (Reactor 1-4) were not operated during the study.

Carbon powder produced from the rest 02 Reactors (viz. Reactor 5 & 6 and only the Reactor 5 was operated during the study due to non-availability of sufficient raw material as informed by the unit operator) is channelized to a dispenser through an inclined screw conveyer instead of hopper. There is no magnetic separator provided for enclosed inclined screw conveyer connected to Reactor 5 & 6.

Carbon powder is filled in the jumbo bags, fastened and moved to the storage area with the help of trolley. Each fully filled jumbo bag weighs ~550 kg. The common enclosed air tight screw conveyer is connected to a dust collection system outside the pyrolysis shed and there is vent of height 12 m. The dust collection system consists of 64 nos. of bag filters. The steel

content is separated by magnetic separator and collected in bags and sold to steel melting units.

The unit has installed an Effluent Treatment Plant (ETP) of capacity 0.5 KLD. It has a Chemical Dosing Tank/Neutralization Tank, Settling Tank, Sludge collection tank, Carbon Filter and treated water collection tank. The treated water is used for gardening within the plant premises. It was informed that oil produced by continuous pyrolysis process generally contains less than 1 % moisture/water which is fired along with Light Oil in the furnace. The water from packed bed scrubber, caustic tank and other sources are treated in the ETP. There are two Diesel Generator sets of 400 kVA and 250 kVA capacity with acoustic enclosure.

In continuous tyre pyrolysis process, tyre crumbs of 20 mm size are continuously fed into the reactor and products viz light oil, heavy oil, carbon black and pyrolysis gases are produced, simultaneously. The pyrolysis process begins with firing Light Oil in the furnace. The hot air from the furnace is passed under the TPR and the hot air after TPR is also partly re-circulated into the furnace to recover the heat. Once the reactor temperature reaches between 450°C – 480°C, the tyre crumbs are fed into the reactor. As soon as the crumbs enter the reactor, the heat energy is consumed by the crumbs to form pyrolysis gases. As a result, the temperature of the front end of the reactor drops. So, the feed rate and temperature of hot air from the furnace are maintained such that the temperature of front end of TPR is maintained between 150°C – 230°C and temperature of back end of TPR is maintained between 450°C – 480°C. It was informed that the residence time of crumbs inside the TPR is nearly 30 minutes, wherein 80% of the gases are released within 20% of residence time and 20% of the gases are released in remaining 80% of residence time. The pyrolysis gases thus released are passed into the vertical oil separator and condensed into Heavy Oil and Light Oil fractions, as mentioned above, and the carbon powder is discharged from closed air tight screw conveyer and filled in jumbo bags.

Photographs of plant & various machineries taken during the visit are given in **Appendix - I**.

4. Gas & Temperature detection/alarm arrangement:

- A bypass pipeline arrangement has been made from the pipeline of Heavy Oil fraction in the vertical separator to facilitate the oil/uncondensed gases from the Reactor to directly

enter the heavy oil condensation tank in the event of chocking/blockage in the condensers.

- Gas sensing systems for the detection of Methane have been installed inside the pyrolysis shed. These sensors are connected to Light Alarm System in the control panel of each TPR. Methane gas detection sensors are provided at front end cap, back end cap, and at carbon black discharger point of the TPR, where chances of leakage of gases may be more. There are 12 nos. of Methane gas detection sensors attached to 06 nos. of TPRs.
- CO inside the pyrolysis shed is monitored manually every 04 hours using CO portable sensors. There are 02 nos. of such CO portable sensors.
- The temperature sensors are provided in the furnace, front and back end of the reactor, ducts above the reactor, light oil condensation tank, and at carbon discharger.
- There are 02 nos. of manually operated fire alarms; one provided at the pyrolysis shed and another at the fire room.
- The reactor pressure and screw feeder rotation frequency are also monitored and remotely controlled from control panel system.
- The workers of the unit were observed using PPE such as safety shoes, helmets, and ear plugs.
- Nitrogen gas purging facility is provided to purge the pyrolysis gases trapped inside the reactor whenever reactor is shut down. Nitrogen gas is supplied from the in-house PSA based Nitrogen plant (capacity - 25 Nm³/h).

5. Fire Safety Arrangement:

The unit has installed 04 nos. of CO₂ type fire extinguishers, 02 nos. of Dry Chemical Powder fire extinguishers and 09 nos. of ABC type Fire Extinguisher at various locations within the pyrolysis shed. Also, fire hydrant valves (09 nos) and hose reel pipe (30 m) are installed inside the pyrolysis shed.

A multipurpose fire tender vehicle was also found within the premise. Water sprinkler (59 nos.) above the hoppers, diesel burners, automated hoppers, reactors, common conveyers, carbon windows, vertical separators, inclined conveyers, caustic tank, heavy oil and light oil

condensation tanks are provided. Provision of an overhead tank of 100 m³ capacity and underground tanks of 70 m³ & 90 m³ capacities are made for water storage. Jockey pump (01 no.), Diesel pump (01 no.) and Electrical pumps (02 nos.) are provided to pump water from water storage tanks.

6. Operational Parameters during the Study Period:

During the study of the plant, only one reactor (Reactor-5) out of 06 installed reactors was operational.

The unit has no provision to weigh the amount of raw material (i.e. tyre crumbs) fed to the reactor and such data are presented with estimates instead of actual weight. At the start of study of the continuous pyrolysis process, on 11/08/2021 at 3:30 PM, the level of oil in the oil condensation tanks were noted, empty jumbo bags were attached to carbon powder dispenser, the hoppers (large hopper 05 MT capacity + Automated Hopper 01 MT capacity) connected to Reactor-5 were filled with tyre crumbs to full capacity and thereafter feeding rate was noted in terms of frequency of screw feeder during the study period. The reactor was continuously fed with tyre crumbs at a constant feeding rate (18 Hz) for 24 hours and the reactor parameters were noted at an interval of 30 minutes. The hoppers were filled with tyre crumbs as and when emptied and thereby estimated feed of tyre crumbs were noted.

After 24 hours, on 12/08/2021 at 3:30 PM, the level of oil in the oil condensation tanks, numbers of jumbo bags filled with carbon bags, and nos. of tyre crumbs feed & quantity of crumbs left in the hoppers were noted. The temperature and pressure profile of the Reactor during continuous pyrolysis process were also noted and the same are given in Table 2.

Table 2: Readings of temperatures and pressures during 24 hours of Tyre Pyrolysis Process.

Time	Temperature in °C										Reactor Pressure (pascal)
	Furnace	Reactor		Ducts					Light oil	CBT#	
		Front end	Back end	BECT*	G1*	G2*	G3*	G4*			
1530	625	167	481	421	584	538	532	535	172	38	45
1600	625	158	480	420	586	541	549	540	172	37	26
1630	682	158	479	419	586	545	542	542	180	36	25
1700	685	153	479	418	588	544	544	545	181	36	24
1730	686	154	480	419	586	541	542	543	181	36	25
1800	710	151	477	416	579	538	538	537	179	36	21

1830	681	151	474	418	581	541	540	540	179	35	14
1900	681	154	472	415	581	549	542	539	175	34	02
1930	626	162	473	420	525	575	552	545	180	34	02
2000	745	164	477	422	596	529	565	555	181	34	02
2030	721	165	421	424	582	586	569	564	182	34	02
2100	736	165	477	422	598	565	559	562	172	34	02
2130	696	159	472	422	596	555	551	559	176	33	02
2200	756	155	464	421	595	555	549	559	175	32	02
2230	764	151	460	425	614	566	559	563	174	32	02
2300	662	152	475	432	616	568	557	561	172	31	02
2330	622	160	480	418	590	546	539	544	145	31	02
2400	754	174	471	422	602	565	562	564	147	32	02
0030	661	172	483	424	597	556	557	562	161	32	02
0100	635	165	485	421	581	535	542	549	169	32	02
0130	636	158	474	416	572	529	533	544	168	32	02
0200	736	155	464	419	587	542	543	553	167	32	02
0230	741	152	465	421	601	551	552	561	169	32	02
0300	752	150	466	428	614	565	556	564	171	32	02
0330	741	152	470	427	601	564	557	562	170	32	02
0400	742	160	472	426	608	562	560	564	166	32	02
0430	736	172	474	425	593	562	561	563	158	32	02
0500	732	175	478	424	598	561	563	563	147	32	02
0530	682	178	485	418	596	557	553	565	161	31	02
0600	669	176	494	421	589	548	551	558	172	31	02
0630	632	177	484	414	566	533	537	545	160	31	02
0700	710	176	478	414	580	546	549	554	161	31	02
0730	651	173	477	411	569	533	538	545	165	31	02
0800	635	168	474	410	566	531	534	541	167	31	02
0830	624	165	465	411	569	530	530	536	168	32	02
0900	670	160	470	415	580	535	541	538	170	32	02
0930	705	157	464	419	590	540	545	540	178	30	02
1000	650	155	467	418	590	542	545	546	175	31	02
1030	635	154	468	418	589	542	541	545	175	31	02
1100	720	152	464	417	588	540	540	540	178	31	02
1130	730	157	470	418	590	545	542	542	180	32	02
1200	745	158	472	419	592	548	544	544	172	32	02
1230	745	161	472	420	592	545	544	545	175	32	02
1300	750	162	475	422	598	544	542	542	178	32	02
1330	735	165	478	422	598	545	547	544	178	32	02
1400	741	166	475	421	605	548	550	548	179	32	02
1430	670	164	478	421	605	548	548	548	178	32	02
1500	705	155	475	415	580	535	539	547	177	31	02
1530	710	160	476	420	585	542	541	541	172	32	02
Average	695	161	473	420	589	548	547	550	171	33	5

*BECT – Back end control temperature; Locations of BCET, G1, G2, G3 and G4 as shown in the figure 3.

#CBT – Carbon Black Temperature.

As informed by the unit representative, increase in 01 unit of oil level is equivalent to ~62 L.

Density of Light oil is 0.905 g/cm³ and density of Heavy oil is 0.935 g/cm³. License to Import

and Store Petroleum in Installation is given at **Annexure-III**. Details of product formation in 24 hours of continuous pyrolysis process are as given in **Table 3**.

Table 3: Estimation of products formed in 24 hours of continuous pyrolysis process

Product	Level in condensation tank		Difference (units)	Oil in Liters (1 unit = 62 L)	Density (g/cm ³)	Oil in kg
	Initial (units)	Final (units)				
Heavy Oil	12	8	4	248	0.935	232
Light Oil	21	74	53	3286	0.905	2974
Carbon powder	Capacity of jumbo bag		Number of jumbo bags		Carbon powder	
	550 kg		05		2750 kg	

7. Inputs and yields during the Continuous Tyre Waste Pyrolysis process:

Details of input and yields from the continuous pyrolysis process for 24 hours are as below;

- i) Tyre crumbs fed into the Pyrolysis Reactor (estimated) : ~7800 kg
- ii) Heavy Oil retrieved : 232 kg (248 L)
- iii) Light Oil retrieved : 2974 kg (3286 L)
- iv) Carbon Black Powder retrieved with steel scrap : 3300 kg

8. Monitoring & Sampling:

The area of the unit premise is about 24,000 m² and surrounded by other units on the South and East side. A road surrounds the West and North side of the unit followed by vegetation. On the North-West side of the unit there is an abandoned building. River Patalganga flows at a distance of about 200 m on the North side of the unit.

Within the premise, the tyre crumbs storage yard (in open) is located at the South-East side, the main Oil storage tanks (90 kL capacity X 03 nos and 130 kL capacity X 03 nos) are located at the North-East corner, and the Pyrolysis Shed is located at the West end of the premises. Cooling Tower-1 & 2, packed bed scrubber, blower and chimney, dust collection system and Effluent Treatment Plant (ETP) are situated at the East side of Pyrolysis shed. The Flaring system is set up on the North side of the Pyrolysis Shed and Carbon powder storage area of 665 m² is located adjacent to pyrolysis shed on the West side. The area of pyrolysis shed is about 2,304 m² wherein 06 nos. of Tyre Pyrolysis Reactors, Condensers, Uncondensed Gas Collection Tanks and Oil collection Tanks are placed. The control panels room, office, and

store rooms are situated at the South side of the pyrolysis shed. The shed has entrance at the South-East corner, fully enclosed from all sides. Emergency exits are provided on the North side and North-East corner. South-West corner has opening to enter Nitrogen plant and storage area.

The layout of different sections in the plant premises are shown in map in **Fig 4**.

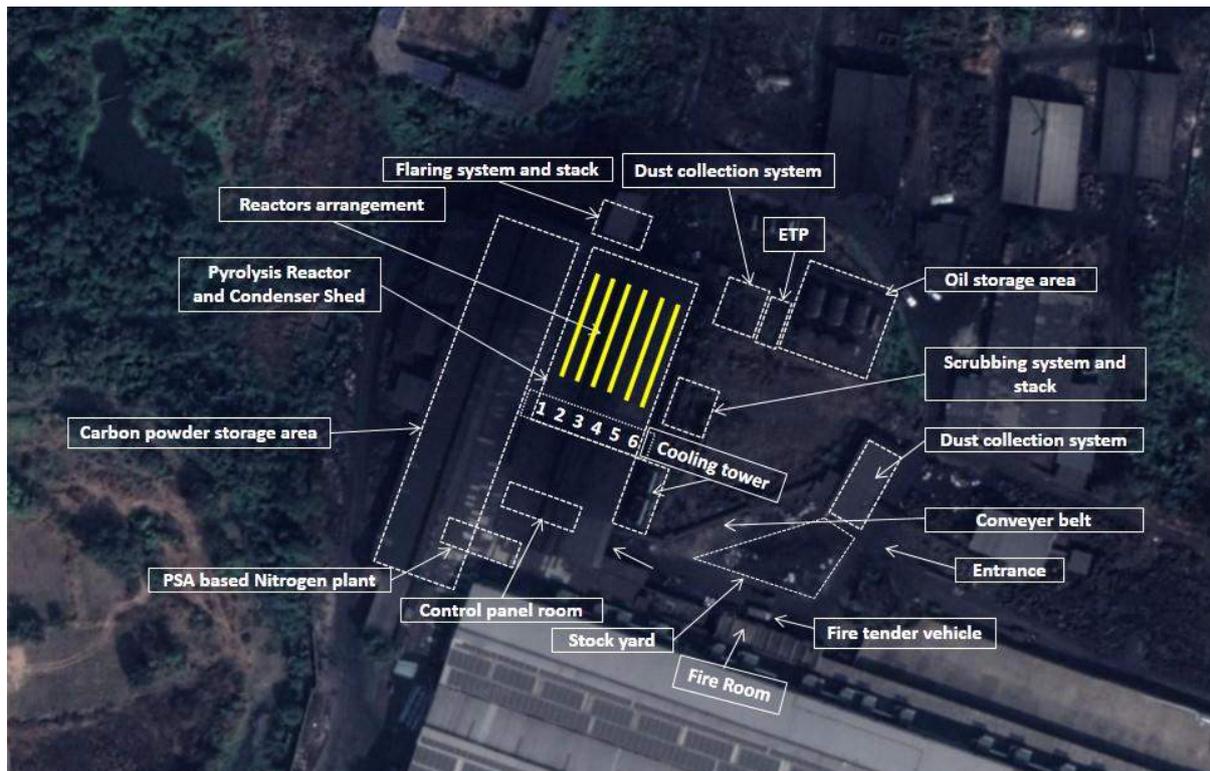


Fig. 4: Layout of different sections in the plant premises of M/s Royal Carbon Black Pvt. Ltd. Survey No. 1, 2, 4, 5, 6, 7, 8/2, 8/3, 8/4, 10/0 and 94/1, Vanivali (Village), Khalapur (Taluk), Raigad (District), Maharashtra.

8.1 Ambient Air Quality Monitoring:

Selection of Ambient Air Quality Monitoring Stations were made based on the field conditions, site suitability and uninterrupted power supply availability. 03 Ambient Air Quality Monitoring Stations were selected i.e., one within the plant premises at about 90 m aerial distance towards SE direction (18.86744°N, 73.2067113°E) and the other two outside boundary of the plant premises viz. at about 200 m aerial distance towards North direction (18.8697357°N, 73.2062908°E) and at about 170 m aerial distance towards SW direction (18.8639291°N, 73.2043053°E). Distance and directions are with reference to pyrolysis shed.

Locations of the said three Ambient Air Quality Monitoring Stations are shown in Google map in **Fig. 5**.

Ambient Air Quality Monitoring at these three stations were carried out for 24 hours during continuous Tyre Pyrolysis process operations for parameters viz. PM10; PM2.5; CO; Total VOCs and Benzo(a)pyrene. The predominant wind direction was observed towards South-East. The study was carried out during monsoon season and slight drizzling occurred during sampling for about 1.5 hours (from 2:30 pm to 4:00 pm) on 12.08.2021.



Fig. 5: Locations of the three Ambient Air Quality Monitoring Stations are shown in Google map

8.2 Work Zone Monitoring:

Work zone air quality was monitored at two different locations for 08 hours for PM10; PM2.5; CO; Total VOCs (TVOC) and Benzo(a)pyrene. These locations are (i) In front of the Tyre Pyrolysis Reactor-5 and near the Z-conveyer (towards West side from the reactor); (ii) Near oil tanks behind the Reactor-5 (towards West side from oil tanks). The same have been named as Work Zone- Station 1 and 2, respectively.

TVOC monitoring was also carried out near the main Oil Storage Tank area where 90 kL capacity X 03 nos. and 130 kL capacity X 03 nos. Oil Storage Tanks are installed.

8.3 Oil Sampling

The heavy oil and light oil fractions derived from the Tyre pyrolysis process were sampled for analysis of Sulphur; Calorific Value; Sediment; Lead; Arsenic; Nickel; Cadmium; Chromium; PAH; Total Halogens; PCBs, and; Water Content.

9. Analysis Results

Analysis results of various parameters monitored, as above (for ambient air quality, work zone air quality and oil derived from the pyrolysis) and analyzed by Laboratory – M/s Bureau Veritas India Pvt. Limited are given at **Annexure - IV**.

The work zone air quality results at various locations are compiled and tabulated in **Table 4**.

Table 4: Work-zone Air Quality Results at various locations

Sl. No.	Station	Duration of Sampling	Analysis Results				
			PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Benzo(a)pyrene ^a (ng/m ³)	CO ^b (mg/m ³)	TVOC (ppm)
1.	Station 1 (In front of feed point of Reactor-5 and near the Z-conveyer. (towards West side from reactor))	10:00 AM to 06:00 PM (12/08/2021) During loading of tyre crumbs into the hopper, transfer of crumbs to Automated Hopper while operation of continuous Pyrolysis process.	63.6	26.1	<1.0	<2.0	0.1 to 0.4 (Avg. value 0.24)
2.	Station 2 Near oil tanks behind the Reactor-5 (towards West side)	10:00 AM to 06:00 PM (12/08/2021) During operation of continuous tyre pyrolysis process.	61.4	24.7	<1.0	<2.0	0.1 to 0.2 (Avg. value 0.13)

from oil tanks)							
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^a 1 ng/m³ as Limit of Quantification, ^b 2 mg/m³ as Limit of Quantification.

The Ambient Air Quality monitoring results at various locations are compiled and tabulated in **Table 5**.

Table 5: Ambient Air Quality Monitoring Results at various locations

Sl. No.	Station	Duration of Sampling	Analysis Results				
			PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Benzo(a)pyrene ^a (ng/m ³)	CO ^b (mg/m ³)	TVOC (ppm)
1.	AAQMS Station-1 Roof-top of Guest House at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad, Maharashtra	03:45 PM on 11/08/2021 to 03:45 PM on 12/08/2021.	56.3	20.8	<1.0	<2.0	0.1 to 0.2 (Avg. value 0.11)
2.	AAQMS Station-2 Near tyre crumbs stock area at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur Raigad, Maharashtra	04:00 PM on 11/08/2021 to 04:00 PM on 12/08/2021.	59.1	23.5	<1.0	<2.0	0.1 to 0.3 (Avg. value 0.18)
3.	AAQMS Station-3 Near Warehouse at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad, Maharashtra	04:20 PM on 11/08/2021 to 04:20 PM on 12/08/2021.	60.7	24.2	<1.0	<2.0	0.1 to 0.3 (Avg. value 0.14)

^a 1 ng/m³ as Limit of Quantification, ^b 2 mg/m³ as Limit of Quantification.

The analysis results reveal that:

- i) The TVOC results near the Oil Storage Tank area (where 90 kL capacity X 03 nos. and 130 kL capacity X 03 nos. of Oil Storage Tanks are installed) are 0.1 to 0.3 ppm.
- ii) The monitored ambient air quality parameters reveal that the same are complying with the respective concentration prescribed under the National Ambient Air Quality

Standards notified vide B-29016/20/90/PCI-I dated 18/11/2009 under the Air (Prevention and Control of Pollution) Act, 1981.

- iii) The analysis results of Heavy and Light oil fractions derived from Continuous Tyre pyrolysis process revealed that they meet the prescribed "Specification of fuel derived from waste oil" notified under Part B of Schedule V of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.
- Calorific value of Heavy Oil and Light Oil fractions have been reported as 7560 cal/g and 7610 cal/g, respectively.

10. Other Observations:

- (a) Monsoon season prevailed during the study and slight drizzling was observed for about 1.5 hours (from 2:30 pm to 4:00 pm) on 12.08.2021 during sampling/monitoring duration.
- (b) Health assessment of 12 nos. of workers of the unit was carried out through questionnaire. Workers of the unit mentioned that they have not observed any impact on their health. Survey of persons (08 nos.) in the adjoining areas (within 1 km radius) was carried out through questionnaire. 06 persons mentioned that odor is felt to the scale of 01 to 02, while 02 persons mentioned that odor is felt to the scale of 04 to 05; 03 persons mentioned that carbon particles are carried with the wind when the wind direction is towards the village (existing within 1 km radius) or when the vehicle carrying carbon powder passes by the village.

However, during the two days of study period, the CPCB and NEERI officials did not observe any impact on the health (like eye irritation, nausea, headache, etc.) while working in the plant. However, odor was felt in the pyrolysis shed to the scale of 1-2 (when rated at scale of 10) and scale of 0-1 at various other locations of the plant premises.

- (c) The unit claims that in the event of non-requirement/non-usage of uncondensed pyrolysis gas (after the oil condensation tank) in the furnace generating hot air, the said uncondensed pyrolysis gas generation can be minimized/controlled by regulating flow of cold water in condensers.
- However, even after regulating such generation of uncondensed pyrolysis gas in the event of non-requirement/non-usage of the same, there may be need of flaring system or activated carbon adsorption tower to control emission of uncondensed pyrolysis gas into the atmosphere. The unit may, therefore, require installation of the said flaring system or activated carbon adsorption.

- (d) The unit has provided firefighting equipment as given in para 5 above. However, fire clearance certificate may also be obtained by the unit from the concerned agency. Further, requisite clearance from PESO, if applicable, may also be obtained by the unit.
- (e) At the time of visit, the dust suction/collection system was not found to be installed for collection of fugitive fibers at the location of handling/transferring of crumbs to conveyer belt. It should be ensured that suitable suction system for the collection of fugitive fibers is installed. The unit representative informed that the dust collection system had to be temporarily disengaged, as installation of a new hopper on top of conveyer belt is underway.
- (f) Spillage of carbon powder on the roads within the premise and on the floor of pyrolysis shed during collection of carbon powder in the jumbo bags was observed. Proper housekeeping should be ensured. In this regard, provision of portable vacuum cleaners/dust collection systems may be considered by the unit.
- (g) Spillage of leachate containing carbon powder from tyre crumbs storage yard were observed surfacing on roads. Tyre crumbs storage may be carried out by covering the same with temporary arrangement using suitable material like tarpaulin during monsoon. Further, periphery drain with collection pit may be provided in the tyre crumb storage and waste water from such pit may be recycled for water sprinkling on tyre crumbs.
- (h) There is no magnetic separator provided for enclosed inclined screw conveyer connected to Reactor 5 & 6 for separation of steel scrap from carbon powder and the same may be provided by the unit.
- (i) The plant operator informed that oil is sold as fuel to industries and Carbon Black Powder is sold to grinding & separating units who process/separate fine carbon black and steel. Separated steel scrap is sent to steel melting units and non-usable carbon black part is sent to cement plant by such grinding & separating units. The unit sells its Carbon Black Powder to grinding & separating units mostly through traders.



(Bharat K Sharma)
Regional Director
Central Pollution Control Board
Regional Directorate Pune,



(K V George)
Scientist & Head - APC Division
National Environmental Engineering
Research Institute, Nagpur

Dated: 20/09/2021

MAHAR

4010437/40207

/4037124/40352

: 24044532/4024

: enquiry@mpcb.gov.in

At : <http://mpcb.gov.in>

POLLUTION CONTROL BOARD



Kalpataru Point, 3rd & 4th floor, Sion- Matunga
Scheme Road No. 8, Opp. Cine Planet Cinema, Near
Sion Circle, Sion (E),
Mumbai - 400 022

Consent order No:- BO/AS(T)/EIC No: RD-2706-14/Raigad/R/CC-234 Date: 03/06/2015

To,
M/s Royal Carbon Black Pvt Ltd
Vill-Vanivali, Tq-Khalapur,
Dist- Raigad

Subject: Consent to Operate under RED category.

Ref: 1. Existing Consent granted vide no. BO/AS(T)/EIC No. RD-2706-14/Raigad/R/CC-4734, dt: 20/05/2014.

2. Minutes of CC meeting held on, dt: 30/05/2015.

Your application Dated: 03/04/2014.

For: Consent to Operate (Renewal) under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 5 of the Hazardous Wastes (M, H & T M) Rules 2008 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

- The consent is granted for a period up to 31/03/2015 to 31/03/2018.
- The proposed and/or actual capital investment of the industry is Rs. 85.71 Crs. (As per C.A. Certificate submitted by Industry).
- The Consent is valid for the manufacture of -

Sr. No.	Product	Maximum Quantity (MT/M)
1.	Bio-Fuels (Oil)	
a	By means of Edible Oil	1650
b	By means of Fats	4000
c	By means of Non Edible Oils	1650
d.	By means of Algae	100
e.	By Means of waste, parings & scraps of Rubber (Pyrolysis)	9000
2.	By Product	
	Glycerin /Carbon Black	900 MT/M

- Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. no.	Description	Permitted quantity of discharge (CMD)	Standards to be achieved	Disposal
1.	Trade effluent	NIL	As per Schedule -I	NIL
2.	Domestic effluent	8.0	As per Schedule -I	On land gardening



Conditions under Air (Prevention and Control of Pollution) Act, 1986 for air emissions:

Sr. no.	Description of stack / source	Number of Stack	Standards to be achieved
1.	Boiler	1	As per Schedule -II
2.	Thermopack	1	As per Schedule -II
3.	DG set (900 KVA)	1	As per Schedule -II

6. Conditions under Hazardous Waste (MH & TM) Rules, 2008 for treatment and disposal of hazardous waste:

Sr. No.	Item No. as per Sch-I	Type of Waste	Quantity	Disposal
1.	5.1	[REDACTED]	[REDACTED]	MPCB approved re-processor.

- 7. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
- 8. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.



For and on behalf of the
Maharashtra Pollution Control Board

[Signature]
9/5/15

(P. K. Mirashe)
Member Secretary

Received Consent fee of -

Sr. No.	Amount (Rs.)	DD. No.	Date	Drawn On
1.	[REDACTED]	537863	10.04.2015	Corporation Bank

(Previous balance fees Rs. [REDACTED] consider for this renewal of consent)

Copy to:

- 1. Regional Officer-Raigad- He is directed to renew previous Bank guarantee of Rs. 5 lakh obtained towards O & M,
- 2. Sub-Regional Officer-Raigad- I, MPCB: To ensure the compliance of the consent conditions
- 3. Chief Accounts Officer, MPCB, Mumbai.
- 4. CC/CAC desk- for record & website updation purposes.

Schedule-I

Terms & conditions for compliance of Water Pollution Control:

1) A.] The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards/ prescribed under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

- | | | |
|-----------------------|---------------|-----------|
| (1) Suspended Solids. | Not to exceed | 100 mg/l. |
| (2) BOD 3 days 27oC. | Not to exceed | 100 mg/l. |

C] The treated sewage shall be soaked in a soak pit, which shall be got cleaned periodically. The treated sewage shall be disposed on land for gardening/irrigation

- 2) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or and extension or addition thereto.
- 3) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
- 4) The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 and as amended, by installing water meters, filing water cess returns in Form-I and other provisions as contained in the said act.

Sr. no.	Purpose for water consumed	Water consumption quantity (GMD)
1.	Industrial Cooling, spraying in chute pits or boiler feed	30.0
2.	Domestic purpose	10.0
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	0.0
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	0.0
5.	Gardening / Tree plantation	0.0

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance/ CREP guidelines.



Schedule-II

Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have proposed to install/ provided the Air pollution control (APC) system and also proposed to erect / erected following stack (s) and to observe the following fuel pattern-

Sr. No.	Stack To	Attached APC System	Height in Mtrs.	Type of Fuel	Quantity & UoM	S %	SO ₂ kg/Day
1		Dust collector		coal	9.00 T/M	0.5	90.0
2		--		F.O.	4.0 T/M	4.5	360
3		Closure enclosure	above roof	HSD	2.0 T/M	1.0	40.0

2. The Applicant shall provide Specific Air Pollution control equipments as per the conditions of EP Act, 1986 and rule made there under from time to time / Environmental Clearance / CREP guidelines. (Concern sections shall mention specific control equipments)
3. The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

Particulate matter	Not to exceed	150 mg/Nm ³ .
SO ₂ Process	Not to exceed	50 mg/Nm ³ .

4. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement well before its life come to an end or erection of new pollution control equipment.
5. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment) in whole or in part is necessary).



Schedule-III
Details of Bank Guarantees

B.G Details:

Sr. No.	Consent (C to R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	Consent to Renewal	██████████ Lakh (extended)	15 days from the date of consent issued	Towards compliance of Consent conditions and O & M of pollution control systems	██████████	██████████

Maharashtra Pollution Control Board



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Schedule-IV

General Conditions:

- 1) The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
- 2) Industry should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly.
- 3) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/displayed to facilitate identification.
- 4) Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
- 5) The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
- 6) The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule, 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- 7) The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the HW(MH&TM) Rules, 2008, which can be recycled /processed/reused/recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc should go for that purpose, in order to reduce load on incineration and landfill site/environment.
- 8) The industry should comply with the Hazardous Waste (M, H & TM) Rules, 2008 and submit the Annual Returns as per Rule 5(6) & 22(2) of Hazardous Waste (M, H & TM) Rules, 2008 for the preceding year April to March in Form-IV by 30th June of every year.
- 9) An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
- 10) The applicant shall make an application for renewal of the consent at least 60 days before the date of the expiry of the consent (in case of Renewal of consent).
- 11) Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website (www.mpcb.gov.in).
- 12) The industry shall constitute an Environmental cell with qualified staff/personnel/agency to see the day to day compliance of consent condition towards Environment Protection.
- 13) Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
- 14) Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
- 15) The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing domestic consumption of chemicals used for treatment shall be maintained.
- 16) Conditions for D.G. Set



- a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
 - b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
 - c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper siting and control measures.
 - d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
 - e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use
 - f) D.G. Set shall be operated only in case of power failure.
 - g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
 - h) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.
- 17) The industry should not cause any nuisance in surrounding area.
 - 18) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
 - 19) The applicant shall maintain good housekeeping.
 - 20) The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a statement on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end, with the Environment Statement.
 - 21) The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
 - 22) The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
 - 23) The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
 - 24) The industry shall submit quarterly statement in respect of industries' obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can be downloaded from MPCB official site).
 - 25) The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
 - 26) The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dt. 16.11.2009 as amended.

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Prakash



MAHARASHTRA POLLUTION CONTROL BOARD

Annexure-II

Phone : 4010437/4020781
 /4037124/4035273
 Fax : 24044532/4024068 /4023516
 Email : enquiry@mpcb.gov.in
 Visit At : <http://mpcb.gov.in>



Kalpataru Point, 3rd & 4th floor, Sion- Matunga
 Scheme Road No. 8, Opp. Cine Planet Cinema, Near
 Sion Circle, Sion (E),
 Mumbai - 400 022

Red/LSI

Date: /07/2018

Consent No: Format 1.0/BO/AST/UAN No. 0000042336/R- A-1808000031

01/08/2018

To,
 M/s. Royal Carbon Black Pvt. Ltd.,
 Survey No. 1,2,4,5,6,7, 8/2, 8/3, 8/4, 10/0 and 94/1,
 Village- Vanivali, Tal- Khalapur, Dist- Raigad.

Sub: Renewal of Consent to Operate with increase in Capital Investment in Red Category.

- Ref:
1. Consent to Operate granted on vide No. BO/AS(T)/E/EIC NO. RD-2706-14/Raigad/R/CC-234 dtd. 30.06.2015 which was valid up to 31.03.2018.
 2. Your Application No. MPCB-CONSENT-0000042336.
 3. Minutes of the Consent Committee Meeting dtd. 25.06.2018

Dated: 09.02.2018.

For Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (M & T M) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. The consent to Operate is granted for a period up to: - 31.03.2023.
2. The capital investment of the industry is 44.73 Cr. as per C.A. Certificate submitted by the Industry.
3. The Consent is valid for the manufacture of -

Sr. No.	Product / By-Product Name	Maximum Quantity	UOM
1.	Bio-fuel Oil		
a)	by means of Edible oil	1650	MT/M
b)	by means of Fats	4000	MT/M
c)	by means of non-edible Oil	1650	MT/M
d)	by means of Algae	100	MT/M
e)	BY means of Waste, paring & Scrap of Rubber (Pyrolysis)	9000	MT/M
2.	By Products		
a)	Glycerin/ Carbon black	900	MT/M

4. Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. No.	Description	Permitted quantity of discharge (CMD)	Standards to be achieved	Disposal
1.	Trade effluent	NIL	As per Schedule I	N.A.
2.	Domestic effluent	8.00	As per Schedule I	On land for gardening

5. Conditions under Air (P&CP) Act, 1981 for air emissions:

Sr. No.	Description of stack / source	Number of Stack	Standards to be achieved
1.	Boiler	1	As per Schedule - II
2.	Thermopack	1	As per Schedule - II
3.	D. G. Set (900 KVA)	1	As per Schedule - II

6. Conditions under Non Hazardous Solid Wastes for treatment and disposal of hazardous waste:

Sr. no.	Type of Waste	Quantity	UOM	Disposal
N.A.				

7. Conditions under Hazardous and other Waste (M & T M) Rules, 2016 for treatment and disposal of hazardous waste:

Sr. no.	Type of Waste	Category	Quantity	UOM	Treat ment	Disposal
1.	Used /spent oil	5.1	500	Litrs/ M	...	Authorized reprocessor

8. The Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.
9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government authorities.
10. This consent is issued with pursuant to the decision of consent committee meeting held on 25.06.2018.

For and on behalf of the
Maharashtra Pollution Control Board


(Dr. P. Anbalagan, IAS)
Member Secretary

Received Consent fee of-

Sr. No.	Amount (Rs.)	Transaction .No.	Date	Drawn On
1.	3,75,000.00	LCRP6065722471	17.02.2018	Online transfer
2.	25,000.00	LCRP6129485629	13.03.2018	Online transfer

Copy to:

1. Regional Officer - MPCB, Raigad and Sub-Regional Officer - Raigad-1,
They are directed to ensure the compliance of the consent conditions
2. Chief Accounts Officer, MPCB, Mumbai.

Schedule-I

Terms & conditions for compliance of Water Pollution Control:

- 1) A) As per your application, the generation of industrial effluent from your activity is NIL.
- 2) A) As per your consent application, you have installed the septic tank followed by soak pit for the treatment of sewage. Overflow, if any shall be applied on land for gardening purpose within premise.
B) The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards/ prescribed under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.
 - (1) Suspended Solids. Not to exceed 100 mg/l.
 - (2) BOD 3 days 27oC. Not to exceed 30 mg/l.C) The treated domestic effluent shall be used for gardening/plantation purpose within premises. There shall not be any discharge outside the factory premises.

- 3) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system and or extension or addition thereto.
- 4) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.
- 5) The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Act, 1974 and as amended, by installing water meters and other provisions as contained in the said act:

Sr. no.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, spraying in mine pits or boiler feed	30.0
2.	Domestic purpose	10.0
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	---
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	---
5.	Others: i) Gardening	---

- 6) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time.



Schedule-II

Terms & conditions for compliance of Air Pollution Control:

1. As per your application, you have provided the Air pollution control (APC) system and also erected following stack (s) and to observe the following fuel pattern

Sr. No.	Stack Attached To	APC System	Height in Mtrs.	Type of Fuel	Quantity & UoM	SO ₂ Kg/Day
1.	Boiler	Dust Collector	38.0	Coal	9.0 MT/M	90.0
2.	Thermopack	--	38.0	F.O.	4 MT/M	360.0
3.	D. G. Set (900 KVA)	Acoustic enclosure	7.5*	HSD	2 Kl/M	40.0

[*- above roof level]

2. The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

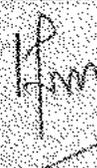
Particulate matter	Not to exceed	150 mg/Nm ³
SO ₂ Process	Not to exceed	50 mg/Nm ³

9. The applicant shall provide specific Air Pollution control equipment's as per the conditions of EP Act, 1986 and rule made there under from time to time/Environmental Clearance/CREP guidelines.
10. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement well before its life come to an end or erection of new pollution control equipment.
11. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

Schedule-III

Details of Bank Guarantees

Sr. No.	Bank Guarantee (C to E/O/R)	Amt. of BG imposed (existing)	Submission period	Purpose of BG	Compliance period	Validity period
1.	C to R	5.0 Lakh	15 days	Towards compliance of the Consent conditions	Upto 31.03.2023	31.09.2023



Schedule IV
General Conditions:

- 1) The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
- 2) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
- 3) Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipment's, the production process connected to it shall be stopped.
- 4) The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
- 5) The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
- 6) The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the HW & other waste (M & TM) Rules 2016, which can be recycled /processed/reused/ recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc. should go for that purpose, in order to reduce load on incineration and landfill site/environment.
- 7) The industry should comply with the Hazardous and other Waste (M & T M) Rules, 2016 and submit the Annual Returns as per Rule 5(6) & 22(2) of Hazardous and other Waste (M & T M) Rules, 2016 for the preceding year April to March in Form-IV by 30th June of every year.
- 8) An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
- 9) The applicant shall made an application for renewal of consent to operate well before 60 days before expiry of existing consent.
- 10) Industry shall strictly comply with the Water (P & C P) Act, 1974, Air (P & C P) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website(www.mpcb.gov.in).
- 11) The industry shall constitute an Environmental cell with qualified staff/personnel/agency to see the day to day compliance of consent condition towards Environment Protection.
- 12) Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
- 13) Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
- 14) The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
- 15) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.
- 16) Conditions for D.G. Set
 - a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
 - b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The

- measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.
- c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper siting and control measures.
 - d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
 - e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
 - f) D.G. Set shall be operated only in case of power failure.
 - g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
 - h) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.
- 17) The industry should not cause any nuisance in surrounding area.
 - 18) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
 - 19) The applicant shall maintain good housekeeping.
 - 20) The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a statement on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end, with the Environment Statement.
 - 21) The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
 - 22) The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipment's provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
 - 23) The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
 - 24) The industry shall submit quarterly statement in respect of industries' obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can be downloaded from MPCB official site).
 - 25) The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
 - 26) The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dt. 16.11.2009 as amended.
 - 27) The industry shall recycle/reprocess/reuse/recover hazardous waste as per the provision contained in the Hazardous and Other Waste (M & T M) Rules 2016, which can be recycled/ processed/ reused/ recovered and only waste which has to be incinerated shall go to incineration and waste which cannot be used for land filling and cannot be recycled/ reprocessed etc. should go for that purpose in order to reduce load on incineration and landfill site/ environment.



प्ररूप 15
(प्रथम अनुसूची का अनुच्छेद 6 देखिए)

FORM XV

(see Article 6 of the First Schedule)

संस्थापनों में पेट्रोलियम के आयात और भंडारकरण के लिए अनुज्ञप्ति
LICENCE TO IMPORT AND STORE PETROLEUM IN INSTALLATION

संशोधन नं. (Amendment No.): 1 दिनांक (dated) 27/3/2012

अनुज्ञप्ति सं. (Licence No.) :- P/HQ/MH/15/5896(P19794)

फीस रूप (Fees Rs.) 10795 /- प्रति वर्ष (Per year)

श्री M/s.Royal Carbon Black Private Limited,, New Era House,Mogul Lane,, Matunga(w),, Mumbai,MUMBAI, Maharashtra, PIN - 400016 को केवल इसमें यथा विनिर्दिष्ट वर्ग के और मात्राओं में पेट्रोलियम 703 किलोलीटर आयात करने के लिए और उसका, नीचे वर्णित और अनुमोदित नक्शा संख्या P/HQ/MH/15/5896(P19794) तारीख 27/3/2012 जो कि इससे उपाबद्ध है, में दिखाए गए स्थान पर भंडारकरण के लिए, पेट्रोलियम अधिनियम, 1934 के उपबंधों या उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अतिरिक्त शर्तों के अधीन रहते हुए यह अनुज्ञप्ति अनुवत की जाती है।

Licence is hereby granted to M/s.Royal Carbon Black Private Limited,, New Era House,Mogul Lane,, Matunga(w),, Mumbai,MUMBAI, Maharashtra, PIN - 400016 valid only for the importation of 703 K.L Petroleum of the classes and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No P/HQ/MH/15/5896(P19794) dated 27/3/2012 attached hereto subject to the provisions of the Petroleum Act, 1934 and the rule made thereunder and to the further conditions of this Licence.

यह अनुज्ञप्ति 31 दिसम्बर 2014 तक प्रवृत्त रहेगी।

The Licence shall remain valid upto 31st day of December 2014

पेट्रोलियम का विवरण (Description of Petroleum)	किलोलीटरों में अनुज्ञप्त क्षमता (Quantity licenced in K.L.)
वर्ग क प्रपुंज पेट्रोलियम (Petroleum Class A in bulk)	निरंक (Nil)
वर्ग क प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class A, otherwise than in bulk)	निरंक (Nil)
वर्ग ख प्रपुंज पेट्रोलियम (Petroleum Class B in bulk)	703 किलोलीटर (KL)
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class B, otherwise than in bulk)	निरंक (Nil)
वर्ग ग प्रपुंज पेट्रोलियम (Petroleum Class C in bulk)	निरंक (Nil)
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न (Petroleum Class C, otherwise than in bulk)	निरंक (Nil)
कुल क्षमता (Total Capacity)	703 किलोलीटर (KL)

अनुज्ञप्ति दिनांक (Licence Date) : 24/4/2009

SA

कृते मुख्य विस्फोटक नियंत्रक
for Chief Controller of Explosives

अनुज्ञप्त परिसरों का विवरण और अवस्थान
DESCRIPTION AND LOCATION OF THE LICENSED PREMISES

अनुज्ञप्त परिसर जिसकी विन्यास सीमाएं अन्य विशिष्टायां संलग्न अनुमोदित नक्शे में दिखाई गई हैं S.No.1to7,8/1,2,3,4,9/1,2,10/0, 96/1,2,94/1,2, Vill. Vanivali, Khalapur, RAIGAD, Maharashtra, स्थान पर अवस्थित है तथा उसमें निम्नलिखित सम्मिलित है :- Six aboveground Petroleum Class `B` (Pyrolysis Oil) storage tanks together with connected facilities.

The licensed premises, the layout, boundaries and other particulars of which are shown in the attached approved plan are situated at S.No.1to7,8/1,2,3,4,9/1,2,10/0, 96/1,2,94/1,2, Vill. Vanivali, Khalapur, RAIGAD, Maharashtra, and consists of Six aboveground Petroleum Class `B` (Pyrolysis Oil) storage tanks together with connected facilities.



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:

M/s. Central Pollution Control Board,
Regional Directorate (Pune), Row House No. 1,
Nisarg Vihar, Balewadi, Pune 411045.

Report Number	: BV/CHEN/21/08/6330-001	Report Date	: 21.08.2021
Internal Sample Number	: 667401	Page	: 1 of 2
Sample Details:		Received on	: 14.08.2021
Product Name	: Ambient Air Quality	Analysis :	
Sample description	: AAQMS - Station 1(Towards North Direction of Pyrolysis Shed)	Commenced on	: 17.08.2021
Location	: Roof-top of Guest House at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad, Maharashtra.	Completed on	: 19.08.2021
Sample drawn by	: Lab Representative Mr. Chalapathy		
Date and duration of sampling	: From : 03.45 PM on 11.08.2021 To : 03.45 PM on 12.08.2021		
Relative Humidity	: 61 %		
Ambient Condition	: Slight drizzling from 2:30 pm to 4:00 pm on 12.08.2021.		
Average Temperature	: 32 °C		
Average Wind Direction	: North West to South East		

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards,CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	56.3	IS 5182 (Part 23) : 2006	24 Hours	100
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	20.8	IS 5182 (Part 24): 2019	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ(LOQ:2.0)	IS 5182 (Part 10) : 1999	8 Hours	04
4.	PAH - Benzo (A) Pyrene	ng/m ³	BLQ:(LOQ: 1.0)	IS 5182(Part 12):2004 (RA :2014)	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Sl.4 sampling and Analysis done for Particulate Phase only.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009 as shown above.

Authorised Signatory

M. RAMESH
MANAGER

Terms and Conditions:

- ◆ The test results relate only to the items tested.
- ◆ The test report shall not be reproduced in full or part without the written approval of BVIL.
- ◆ The test items will not be retained for more than 15 days from the date of issue of test report excepts in the case as required by the applicable regulations.
- ◆ The Laboratory's responsibility under this report is limited to proven wilful negligence and will in no case be more than the invoiced amount.
- ◆ A satisfactory test report in no way implies that the product so tested is approved by NABL.
- ◆ Laboratory is not responsible for the authenticity of photocopied test reports.

Bureau Veritas India Pvt. Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,
Phase III, Ekkattuthangal, Guindy, Chennai-600 032.
Phone : +91 44 - 4967 4000, 4967 4002, 4028
Web : www.bureauveritas.com

Sl. No : 11183 /2021-22



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/08/6330-001

Report Date : 21.08.2021

Internal Sample Number : 667401

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
11.08.21	03.45PM	0.1	229.4
11.08.21	04.45PM	0.1	229.4
11.08.21	05.45PM	0.1	229.4
11.08.21	06.45PM	0.1	229.4
11.08.21	07.45PM	0.1	229.4
11.08.21	08.45PM	0.1	229.4
11.08.21	09.45PM	0.1	229.4
11.08.21	10.45PM	0.1	229.4
11.08.21	11.45PM	0.2	458.9
12.08.21	12.45AM	0.2	458.9
12.08.21	01.45AM	0.1	229.4
12.08.21	02.45AM	0.1	229.4
12.08.21	03.45AM	0.1	229.4
12.08.21	04.45AM	0.1	229.4
12.08.21	05.45AM	0.1	229.4
12.08.21	06.45AM	0.1	229.4
12.08.21	07.45AM	0.1	229.4
12.08.21	08.45AM	0.1	229.4
12.08.21	09.45AM	0.1	229.4
12.08.21	10.45AM	0.2	458.9
12.08.21	11.45AM	0.1	229.4
12.08.21	12.45PM	0.1	229.4
12.08.21	01.45PM	0.1	229.4
12.08.21	02.45PM	0.1	229.4
12.08.21	03.45PM	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: M.Gowri.

Authorised Signatory

M.RAMESH
MANAGER

Terms and Conditions :

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- ❖ Laboratory is not responsible for the authenticity of photocopied test reports.

Bureau Veritas India Pvt.Ltd.

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Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.
Phone : +91 44 - 4967 4000, 4967 4002, 4028
Web : www.bureauveritas.co.in

SI No. : 21121/2020-21



TEST REPORT



SAMPLE DRAWN BY LABORATORY

**BUREAU
VERITAS**

Issued to:

M/s. Central Pollution Control Board,
Regional Directorate (Pune), Row House No. 1,
Nisarg Vihar, Balewadi, Pune 411045.

Report Number	: BV/CHEN/21/08/6330-002	Report Date	: 21.08.2021
Internal Sample Number	: 667402	Page	: 1 of 2
Sample Details:		Received on	: 14.08.2021
Product Name	: Ambient Air Quality	Analysis :	
Sample description	: AAQMS - Station 2 (Towards South East direction of Pyrolysis Shed)	Commenced on	: 17.08.2021
Location	: Near tyre crumbs stock area at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad, Maharashtra.	Completed on	: 19.08.2021
Sample drawn by	: Lab Representative Mr. Chalapathy		
Date and duration of sampling	: From : 04.00 PM on 11.08.2021 To : 04.00 PM on 12.08.2021		
Relative Humidity	: 61 %		
Ambient Condition	: Slight drizzling from 2:30 pm to 4:00 pm on 12.08.2021.		
Average Temperature	: 32 °C		
Average Wind Direction	: North West to South East		

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards, CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	59.1	IS 5182 (Part 23) : 2006	24 Hours	100
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	23.5	IS 5182 (Part 24): 2019	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ(LOQ:2.0)	IS 5182 (Part 10) : 1999	8 Hours	04
4.	PAH - Benzo (A) Pyrene	ng/m ³	BLQ:(LOQ: 1.0)	IS 5182(Part 12):2004	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Sl.4 sampling and Analysis done for Particulate Phase only.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009 as shown above.

Bureau Veritas India Pvt. Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,
Phase III, Ekkattuthangal, Guindy, Chennai-600 032.
Phone : +91 44 - 4967 4000, 4967 4002, 4028
Web : www.bureauveritas.com

Sl. No : 11184 /2021-22

Terms and Conditions:

- ❖ The test results relate only to the items tested.
- ❖ The test report shall not be reproduced in full or part without the written approval of BVIL.
- ❖ The test items will not be retained for more than 15 days from the date of issue of test report excepts in the case as required by the applicable regulations.
- ❖ The Laboratory's responsibility under this report is limited to proven wilful negligence and will in no case be more than the invoiced amount.
- ❖ A satisfactory test report in no way implies that the product so tested is approved by NABL.
- ❖ Laboratory is not responsible for the authenticity of photocopied test reports.

Authorised Signatory

**M.RAMESH
MANAGER**



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/08/6330-002

Report Date : 21.08.2021

Internal Sample Number : 667402

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
11.08.21	03.55PM	0.2	458.9
11.08.21	04.55PM	0.2	458.9
11.08.21	05.55PM	0.2	458.9
11.08.21	06.55PM	0.1	229.4
11.08.21	07.55PM	0.1	229.4
11.08.21	08.55PM	0.1	229.4
11.08.21	09.55PM	0.1	229.4
11.08.21	10.55PM	0.2	458.9
11.08.21	11.55PM	0.2	458.9
12.08.21	12.55AM	0.2	458.9
12.08.21	01.55AM	0.2	458.9
12.08.21	02.55AM	0.2	458.9
12.08.21	03.55AM	0.2	458.9
12.08.21	04.55AM	0.2	458.9
12.08.21	05.55AM	0.2	458.9
12.08.21	06.55AM	0.2	458.9
12.08.21	07.55AM	0.1	229.4
12.08.21	08.55AM	0.1	229.4
12.08.21	09.55AM	0.2	458.9
12.08.21	10.55AM	0.1	229.4
12.08.21	11.55AM	0.2	458.9
12.08.21	12.55PM	0.2	458.9
12.08.21	01.55PM	0.3	688.3
12.08.21	02.55PM	0.2	458.9
12.08.21	03.55PM	0.2	458.9

Method of Analysis / Instrument used: PID Analyser.

End.....

Report Prepared By: M Gowri.

Authorised Signatory

M.RAMESH
MANAGER

Terms and Conditions :

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- ❖ The test report shall not be reproduced in full or part without the written approval of BVIL.
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- ❖ Laboratory is not responsible for the authenticity of photocopied test reports.

Bureau Veritas India Pvt.Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,

Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.

Phone : +91 44 - 4967 4000, 4967 4002, 4028

Web : www.bureauveritas.co.in

SI No. : 21122/2020-21



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY



TC-8057

Issued to:

M/s. Central Pollution Control Board,
Regional Directorate (Pune), Row House No. 1,
Nisarg Vihar, Balewadi, Pune 411045.

Report Number	: BV/CHEN/21/08/6330-003	Report Date	: 21.08.2021
Internal Sample Number	: 667403	Page	: 1 of 2
Sample Details:		Received on	: 14.08.2021
Product Name	: Ambient Air Quality	Analysis :	
Sample description	: AAQMS - Station 3.(Towards South West director of Pyrolysis Shed).	Commenced on	: 17.08.2021
Location	: Near Warehouse at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad, Maharashtra.	Completed on	: 19.08.2021
Sample drawn by	: Lab Representative Mr. Chalapathy		
Date and duration of sampling	: From : 04.20PM on 11.08.2021 To : 04.20PM on 12.08.2021		
Relative Humidity	: 61 %		
Ambient Condition	: Slight drizzling from 2:30 pm to 4:00 pm on 12.08.2021.		
Average Temperature	: 32 °C		
Average Wind Direction	: North west to South East.		

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards, CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	60.7	IS 5182 (Part 23) : 2006	24 Hours	100
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	24.2	IS 5182 (Part 24): 2019	24 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ(LOQ:2.0)	IS 5182 (Part 10) : 1999	8 Hours	04
4.	PAH - Benzo (A) Pyrene	ng/m ³	BLQ:(LOQ: 1.0)	IS 5182(Part 12):2004	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 24hours monitoring for Sl.No.1,2 & 4. 8 hour monitoring for S.No.3.

Sl.4 sampling and Analysis done for Particulate Phase only.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009 as shown above.

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Authorised Signatory

**M.RAMESH
MANAGER**



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/08/6330-003

Report Date : 21.08.2021

Internal Sample Number : 667403

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
11.08.21	04.05PM	0.1	229.4
11.08.21	05.05PM	0.1	229.4
11.08.21	06.05PM	0.2	458.9
11.08.21	07.05PM	0.1	229.4
11.08.21	08.05PM	0.1	229.4
11.08.21	09.05PM	0.1	229.4
11.08.21	10.05PM	0.1	229.4
11.08.21	11.05PM	0.1	229.4
11.08.21	12.05AM	0.2	458.9
12.08.21	01.05AM	0.2	458.9
12.08.21	02.05AM	0.1	229.4
12.08.21	03.05AM	0.2	458.9
12.08.21	04.05AM	0.2	458.9
12.08.21	05.05AM	0.2	229.4
12.08.21	06.05AM	0.1	229.4
12.08.21	07.05AM	0.1	229.4
12.08.21	08.05AM	0.1	229.4
12.08.21	09.05AM	0.1	229.4
12.08.21	10.05AM	0.1	229.4
12.08.21	11.05AM	0.1	229.4
12.08.21	12.05PM	0.2	458.9
12.08.21	01.05PM	0.1	229.4
12.08.21	02.05PM	0.1	229.4
12.08.21	03.05PM	0.3	688.3
12.08.21	04.05PM	0.2	458.9

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: M.Gowri.

Authorised Signatory

M.RAMESH
MANAGER

Bureau Veritas India Pvt.Ltd.

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SI No. : 21123/2020-21

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TEST REPORT

SAMPLE DRAWN BY LABORATORY

**BUREAU
VERITAS**

Issued to:

M/s. Central Pollution Control Board,
Regional Directorate (Pune), Row House No. 1,
Nisarg Vihar, Balewadi, Pune 411045.

Report Number	: BV/CHEN/21/08/6330-004	Report Date	: 21.08.2021
Internal Sample Number	: 667404	Page	: 1 of 2
Sample Details:		Received on	: 14.08.2021
Product Name	: Work Zone	Analysis :	
Sample description	: Work Zone - Station 1.	Commenced on	: 17.08.2021
Location	: In front of the feed point of pyrolysis reactor inside pyrolysis shed at M/s Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad,	Completed on	: 18.08.2021
Sample drawn by	: Lab Representative Mr. Chalapathy		
Date and duration of sampling	: From :10.00 AM on 12.08.2021 To : 06.00 PM on 12.08.2021		
Relative Humidity	: 68%		
Ambient Condition	: Clear		
Average Temperature	: 31°C		
Average Wind Direction	: North west to South east.		

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards, CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	63.6	IS 5182 (Part 23) : 2006	8 Hours	100
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	26.1	IS 5182 (Part 24): 2019	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ(LOQ:2.0)	IS 5182 (Part 10) : 1999	8 Hours	04
4.	PAH - Benzo (A) Pyrene	ng/m ³	BLQ:(LOQ: 1.0)	IS 5182(Part 12):2004	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8 hours monitoring.

Sl.4 sampling and Analysis done for Particulate Phase only.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009 as shown above.

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Sl No. : 21124/2020-21

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Authorised Signatory

M.RAMESH

MANAGER



**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/08/6330-004

Report Date : 21.08.2021

Internal Sample Number : 667404

Page : 2 of 2

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
12.08.21	10.00AM	0.2	458.8
12.08.21	11.00AM	0.2	458.8
12.08.21	12.00PM	0.1	229.4
12.08.21	01.00PM	0.3	688.3
12.08.21	02.00PM	0.2	458.8
12.08.21	03.00PM	0.4	917.8
12.08.21	04.00PM	0.4	917.8
12.08.21	05.00PM	0.3	688.3
12.08.21	06.00PM	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....End.....
Report Prepared By: M.Gown.

Authorised Signatory

M.RAMESH

MANAGER

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SI No. : 21125/2020-21

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TEST REPORT

SAMPLE DRAWN BY LABORATORY

**BUREAU
VERITAS**

Issued to:

M/s. Central Pollution Control Board,
Regional Directorate (Pune), Row House No. 1,
Nisarg Vihar, Balewadi, Pune 411045.

Report Number	: BV/CHEN/21/08/6330-005	Report Date	: 21.08.2021
Internal Sample Number	: 667405	Page	: 1 of 3
Sample Details:		Received on	: 14.08.2021
Product Name	: Work Zone	Analysis :	
Sample description	: Work Zone - Station 2.	Commenced on	: 17.08.2021
Location	: Near Oil collection tank inside pyrolysis shed at Royal Carbon Black Pvt. Ltd., Vanivali, Khalapur, Raigad, Maharashtra.	Completed on	: 19.08.2021
Sample drawn by	: Lab Representative Mr. Chalapathy		
Date and duration of sampling	: From : 10.15 AM on 12.08.2021 To : 06.15 PM on 12.08.2021		
Relative Humidity	: 68 %		
Ambient Condition	: Clear		
Average Temperature	: 31°C		
Average Wind Direction	: North west to south east.		

Sl.No.	Pollutants	Units	Results	Sampling and Analysis Method	National ambient air quality standards, CPCB Notification Nov. 2009	
					Time Weighted Average	Industrial, Residential, Rural and Other area
1.	Particulate Matter (size less than 10 µm) or PM ₁₀	µg/m ³	61.4	IS 5182 (Part 23) : 2006	8 Hours	100
2.	Particulate Matter (size less than 2.5 µm) or PM _{2.5}	µg/m ³	24.7	IS 5182 (Part 24): 2019	8 Hours	60
3.	Carbon monoxide (CO)	mg/m ³	BLQ(LOQ:2.0)	IS 5182 (Part 10) : 1999	8 Hours	04
4.	PAH - Benzo (A) Pyrene	ng/m ³	BLQ:(LOQ: 1.0)	IS 5182(Part 12):2004	Annual*	1.0

BLQ : Below Limit of Quantification / LOQ: Limit of Quantification.

* The value given in National ambient air quality standards, CPCB notification Nov'2009. for annual is taken as specification for 8 hours monitoring.

Sl.4 sampling and Analysis done for Particulate Phase only.

Remarks : The values observed for the pollutants given above are within the specification of National ambient air quality standards, CPCB notification Nov'2009 as shown above.

..... Contd.....

Authorised Signatory

M. RAMESH
MANAGER

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Sl No. : 21126/2020-21



BUREAU
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TEST REPORT

Report Number : BV/CHEN/21/08/6330-005

Report Date : 21.08.2021

Internal Sample Number : 667405

Page : 2 of 3

Date	Time	TVOC Results (as Iso-Butylene)	
		in PPM	in ug/m ³
12.08.21	10.15AM	0.1	229.4
12.08.21	11.15AM	0.1	229.4
12.08.21	12.15PM	0.1	229.4
12.08.21	01.15PM	0.2	458.9
12.08.21	02.15PM	0.2	458.9
12.08.21	03.15PM	0.1	229.4
12.08.21	04.15PM	0.2	458.8
12.08.21	05.15PM	0.1	229.4
12.08.21	06.15PM	0.1	229.4

Method of Analysis / Instrument used: PID Analyser.

.....Contd.....

Authorised Signatory

M.RAMESH

MANAGER

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SI No. : 21127/2020-21

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**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/08/6330-005

Report Date : 21.08.2021

Internal Sample Number : 667405

Page : 3 of 3

Location: Near OIL Storage Yard

Date	Time	TVOC Results as Iso-Butylene	
		in PPM	in ug/m ³
11.08.21	04.30 PM	0.1	229.4
11.08.21	05.30 PM	0.1	229.4
11.08.21	06.30 PM	0.1	229.4
11.08.21	07.30 PM	0.3	688.3
11.08.21	08.30 PM	0.2	458.8
11.08.21	09.30 PM	0.1	229.4
11.08.21	10.30 PM	0.2	458.8
11.08.21	11.30 PM	0.2	458.8
12.08.21	12.30 AM	0.1	229.4
12.08.21	01.30 AM	0.1	229.4
12.08.21	02.30 AM	0.2	458.8
12.08.21	03.30 AM	0.2	458.8
12.08.21	04.30 AM	0.1	229.4
12.08.21	05.30 AM	0.1	229.4
12.08.21	06.30 AM	0.1	229.4
12.08.21	07.30 AM	0.1	229.4
12.08.21	08.30 AM	0.2	458.8
12.08.21	09.30 AM	0.1	229.4
12.08.21	10.30 AM	0.1	229.4
12.08.21	11.30 AM	0.1	229.4
12.08.21	12.30 PM	0.1	229.4
12.08.21	01.30 PM	0.1	229.4
12.08.21	02.30 PM	0.2	458.8
12.08.21	03.30 PM	0.2	458.8
12.08.21	04.30 PM	0.2	458.8

.....End.....
Report Prepared By: M.Gowri.

Authorised Signatory

M.RAMESH
MANAGER

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TEST REPORT

SAMPLE DRAWN BY LABORATORY

Issued to:
M/s. Central Pollution Control Board
Regional Directorate (Pune), Row House No-1
Nisarg Vihar, Balewadi, Pune - 411045.

Report Number : BV/CHEN/21/08/6329-001
Internal sample Number : 667394

Report date : 01.09.2021

Page no. : 1 of 2

Sample Details:

Product Name : Tyre Pyrolysis Oil
Sample Description : Light Oil fraction derived from Tyre Pyrolysis.
Quantity : 1L
Sampled By / Date : Bureau Veritas Representative Mr. Chalapathy
Sampling Data sheet dated : 12.08.2021
Sample Location : Oil Collection Tank inside Pyrolysis Shed at
M/s Royal Carbon Black Pvt. Ltd.,
Vanivali, Khalapur, Raigad, Maharashtra.
Sampling Protocol : BVILCH/QMS/SOP-012
Appearance : Dark coloured liquid

Received on : 14.08.2021

Commenced on : 17.08.2021

Completed on : 31.08.2021

Sl. No.	Test Parameters	Unit of Measurement	Results	Limits as per HWM Rules 2016 - Schedule (V)	Method of Testing/ Instrument used
1.	Total Halogens as Cl	mg/kg	815	4000, Max	USEPA 5050 / 9253
2.	Lead as Pb	mg/kg	BLQ (LOQ:1.0)	100, Max	USEPA 3031
3.	Arsenic as As	mg/kg	BLQ (LOQ:1.0)	5, Max	
4.	Cadmium as Cd	mg/kg	BLQ (LOQ:1.0)	Cd + Cr + Ni 500, Max	
5.	Nickel as Ni	mg/kg	BLQ (LOQ:1.0)		
6.	Chromium as Cr	mg/kg	BLQ (LOQ:1.0)		
7.	Water Content	% by mass	0.40	1, Max	ASTM D 95
8.	Sulfur Content	% by mass	0.14	4.5, Max	IS: 1448 part 33
9.	Gross Calorific value	cal/g	7610		ASTM D 240

..... Contd.

Authorised Signatory
**M. RAMESH
MANAGER**

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SI No. : 21129/2020-21



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TEST REPORT

Report Number : BV/CHEN/21/08/6329-001

Report date : 01.09.2021

Internal Sample Number : 667394

Page : 2 of 2

Sl. No.	Test Parameters	Unit of Measurement	Results	Limits as per HWM Rules 2016 - Schedule V	Method of Testing/ Instrument used
10.	Polychlorinated Biphenyls(PCBS)	mg/kg	BLQ (LOQ:1.0)	2, Max	USEPA 8082 A
11.	Polynuclear Aromatic Hydrocarbons (PAH)	% by mass	BLQ (LOQ:0.01)	6, Max	USEPA 8100
12.	Sludge (Sediment)	% by mass	0.19	0.25	ASTM D 4898

BLQ - Below Limit of Quantification / LOQ - Limit of Quantification.

Remarks: The sample meets the requirements of HWM Rules 2016 - Schedule (V) and suitable for re-cycling as shown above.

..... End.....
Report Prepared by: M.Gowri

Authorised Signatory
M.RAMESH
MANAGER

Bureau Veritas India Pvt.Ltd.

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SI No. : 21130/2020-21



**BUREAU
VERITAS**

TEST REPORT

SAMPLE DRAWN BY LABORATORY

Issued to:
M/s. Central Pollution Control Board
Regional Directorate (Pune), Row House No-1
Nisarg Vihar, Balewadi, Pune - 411045.

Report Number : BV/CHEN/21/08/6329-002
Internal sample Number : 667395

Report date : 01.09.2021

Page no. : 1 of 2

Sample Details:

Product Name : Tyre Pyrolysis Oil
Sample Description : Heavy Oil fraction derived from Tyre Pyrolysis.
Quantity : 1L
Sampled By / Date : Bureau Veritas Representative Mr. Chalapathy
Sampling Data sheet dated : 12.08.2021

Received on : 14.08.2021

Commenced on : 17.08.2021

Completed on : 31.08.2021

Sample Location : Oil Collection Tank inside Pyrolysis Shed at
M/s Royal Carbon Black Pvt. Ltd.,
Vanivali, Khalapur, Raigad, Maharashtra.

Sampling Protocol : BVILCH/QMS/SOP-012
Appearance : Dark coloured liquid

Sl. No.	Test Parameters	Unit of Measurement	Results	Limits as per HWM Rules 2016 - Schedule (V)	Method of Testing/ Instrument used
1.	Total Halogens as Cl	mg/kg	740	4000, Max	USEPA 5050 / 9253
2.	Lead as Pb	mg/kg	BLQ (LOQ:1.0)	100, Max	USEPA 3031
3.	Arsenic as As	mg/kg	BLQ (LOQ:1.0)	5, Max	
4.	Cadmium as Cd	mg/kg	BLQ (LOQ:1.0)	Cd + Cr + Ni 500, Max	
5.	Nickel as Ni	mg/kg	BLQ (LOQ:1.0)		
6.	Chromium as Cr	mg/kg	BLQ (LOQ:1.0)		
7.	Water Content	% by mass	0.32	1, Max	ASTM D 95
8.	Sulfur Content	% by mass	0.15	4.5, Max	IS: 1448 part 33
9.	Gross Calorific value	cal/g	7560		ASTM D 240

..... Contd.

Authorised Signatory

M. RAMESH

MANAGER

Bureau Veritas India Pvt.Ltd.

F2, Thiru.Vi. Ka. Industrial Estate,

Phase III, Ekkattuthangal, Guindy, Chennai - 600 032.

Phone : +91 44 - 4967 4000, 4967 4002, 4028

Web : www.bureauveritas.co.in

Sl No. : 21131/2020-21

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**BUREAU
VERITAS**

TEST REPORT

Report Number : BV/CHEN/21/08/6329-002

Report date : 01.09.2021

Internal Sample Number : 667395

Page : 2 of 2

Sl. No.	Test Parameters	Unit of Measurement	Results	Limits as per HWM Rules 2016 - Schedule V	Method of Testing/ Instrument used
10.	Polychlorinated Biphenyls(PCBS)	mg/kg	BLQ (LOQ:1.0)	2, Max	USEPA 8082 A
11.	Polynuclear Aromatic Hydrocarbons(PAH)	% by mass	BLQ (LOQ:0.01)	6, Max	USEPA 8100
12.	Sludge (Sediment)	% by mass	0.21	0.25	ASTM D 4898

BLQ - Below Limit of Quantification / LOQ - Limit of Quantification.

Remarks: The sample meets the requirements of HWM Rules 2016 - Schedule (V) and suitable for re-cycling as shown above.

..... End.....
Report Prepared by: M.Gowri

Authorised Signatory

M.RAMESH
MANAGER

Bureau Veritas India Pvt.Ltd.

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SI No. : 21132/2020-21

Photographs of plant & various machineries taken during the visit.



Tyre crumbs piled at storage yard.



Tyre crumbs are being sprayed with water at storage yard.



Tyre crumbs being fed onto the conveyer belt by a loader machine.



Conveyer belt system



Crumbs being filled into Hopper (5 MT capacity)



Z-conveyer filling the Automated Hopper (1 MT capacity). Two furnaces connected to two reactors can also be seen.



Automated hopper equipped with sensor to control the level of crumbs in the hopper.



Tyre crumbs entering Screw feeder system from Automated Hopper.



Reactor pressure sensor



Furnace



Tyre Pyrolysis Reactor and duct for recirculation of hot air



Duct for recirculation of Hot air



Recirculated Hot air entering the furnace



Vertical oil separator connected to the Reactor



Light oil condenser is at the top and Heavy oil condenser is at the bottom



Bypass system connected to Light Oil Condensing Line



Heavy oil condensation tank on the right and Light oil condensation tank on the left. Vertical condensers are provided over the Light oil condensation tank.



Caustic tank



Uncondensed gases channelisation to the Furnace



Closed carbon conveyor with vent provided for dust collection



Carbon powder is being collected in Jumbo bag



Dust collection system connected to conveying system of Carbon powder



Stack attached to packed bed scrubbing system and ID fan



Forced Draft Cooling towers



Effluent Treatment Plant



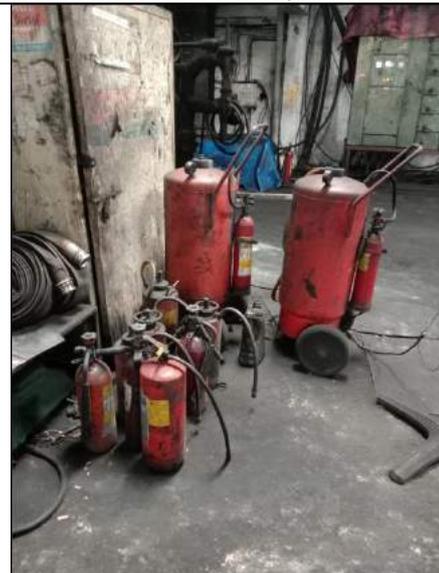
Gas sensor



Gas Detection System



Fire Alarm system



Fire extinguishers of different capacity and type



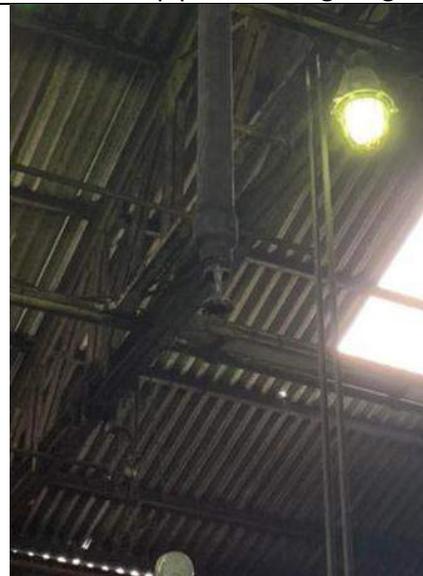
Hydrant valve provided at the pyrolysis shed



Hose reel pipe for fire fighting



Sprinklers provided above the equipment in pyrolysis shed



Hydrant valve at crumb storage yard



Fire tender vehicle



Hydrant valve provided at the pyrolysis shed



Hose reel pipe for fire fighting



Sprinklers provided above the equipment in pyrolysis shed



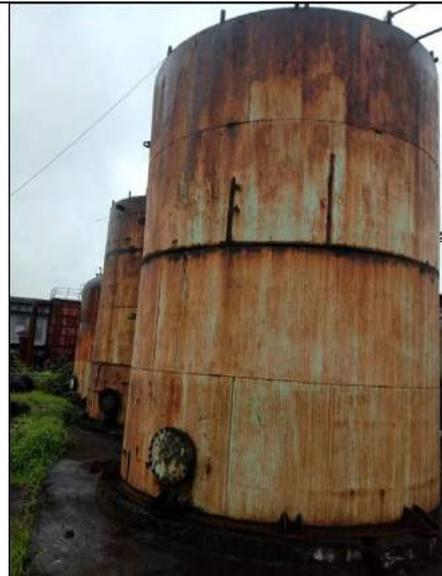
Hydrant valve at crumb storage yard



Fire tender vehicle



Heavy oil storage tanks



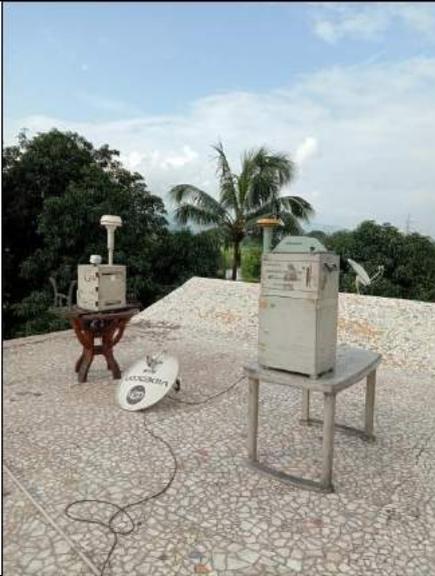
Light oil storage tanks



Work zone monitoring station - 1



Work zone monitoring station - 2



Ambient Air Quality Monitoring station - 1



Ambient Air Quality Monitoring station - 2



Ambient Air Quality Monitoring station - 3

Study Report on existing batch process unit of M/s Mahie Green Earth, 9th Km Stone, Meerut Road, Muzaffarnagar - 251001, Uttar Pradesh

1. Background

In compliance with NGT order dated 06.01.2020 in the matter of OA No. 400/2019, study was carried out at M/s Mahie Green Earth Product, Khasra No.194 Vill, Nara,9 km, Meerut Road, Muzaffarnagar-251001 following the protocol as detailed below:

- The monitoring will be carried out at both work place as well as ambient air quality with following parameters:
 - Work Place Monitoring (to cover entire production cycle of TPO i.e. feeding of reactor, pyrolysis of rubber, cooling period and unloading of reactor i.e. removal of carbon & steel) for respirable dust (PM₁₀, PM_{2.5}), CO, VOCs, B(a)P,
 - Ambient Air Quality Monitoring (24 hr. monitoring) for PM₁₀, PM_{2.5}, B(a)P, VOCs
- In case of batch process monitoring to be carried out at work place at the time of feeding waste tyre in the reactors and during opening of reactor for removal of carbon black powder & steel for comparison purpose.
- For ambient air quality, monitoring to be carried out for 24 hr. time weighted average during operation of the plant at two to four locations.
- Work Place monitoring to be carried at two to four locations and should cover entire manufacturing process of TPO i.e. i.e. feeding of reactor, pyrolysis of tyre, cooling period and unloading of reactor.
- Detailed analysis of tyre pyrolysis oil (as per schedule V Part B of Hazardous & other waste (M&TM) Rules 2016) in terms of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content.
- Detailed compositional Analysis of TPO w.r.t Carbon Number, specific gravity/density, Acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson carbon residue), Ash content, Pour Point, PONA (Paraffin, Olefins, Naphtha, Aromatics)
- Assessment of temperature and pressure (mean as well as profiles), design parameters of the units, incoming feed rate and product rate data from typical units will also be monitor.
- Locations and numbers of sensors/alarms.
- Survey of minimum 10 persons in the adjoining areas (within 1km radius) through questionnaire (draft questionnaire attached)
- Health assessment of workers through questionnaire.
- Any other parameter of interest if found to be useful during the study may also be included.

Accordingly, monitoring was carried out during September 23, 2021 to September 24, 2021 by CPCB's team lead by Shri Tarun Darbari, Scientist 'D' at the aforesaid unit M/s Mahie Green Earth Product, Khasra No.194 Vill, Nara,9 km, Meerut Road, Muzaffarnagar-251001 and sampling was carried out through a laboratory- M/s Fare Labs Private Limited recognized under the Environment (Protection) Act, 1986. Mr. Arun Chaturvedi, Manager (Environment Air Section) represented as team leader from the laboratory side during the sampling and Shri Amit Kumar, SRF from CPCB and Shri Vipul Kumar, J.E. from Uttar Pradesh Pollution Board were present during study.

2. About the Industry – location, plant & machineries

M/s Mahie Green Earth Product Khasra No.194 Vill, Nara, 9 km, Meerut Road, Muzaffarnagar-251001 has total land area of 15 acres (37625.731mtrs.) The unit is carrying out production of Tyre Pyrolysis Oil (TPO) using existing batch process. The unit has installed three (3) numbers

of reactors of capacity 8MT each. Out of three (3) reactors, only one reactor was operational other two have some technical fault. The diameter of reactor was 2.7 meter. Length of reactor was 6.1 meter. Temperature and pressure gauge was installed between reactor and primary tank (which was not calibrated, as the temperature gauge showed 100 °C at the time of loading). There was one wet scrubber for operating reactor followed by a stack of thirty (30) meters height. The reactor is covered with canopy. Front, back and bottom Sides of the reactor was without canopy. The canopy was connected with the wet scrubber and stack of 30metre height for emission of flue gases. The reactor has spiral arrangement, which helps in unloading of carbon black. For removal of carbon black, the reactor was moved slowly in counter clockwise direction resulting into unloading of carbon black in the carbon storage room built underground below the reactor through a chute. The chute of the reactor is opened manually through a door provided in the canopy. Once the reactor starts generating pyro gas, the same was used for heating the reactor itself. Every reactor was attached with two (2) condensers and primary oil collection tanks. From the oil collection tanks the TPO was transferred into a common oil storage tank. There are 8 workers working in the plant. The unit has DG set of 62.5 KVA.

The unit has valid CTO under Air Act 1974 & Water Act 1981. As per CTO the unit has been given consent of producing Tyre Pyrolysis Oil (TPO) @ 8 MTD, Carbon Black @ 8MTD & Steel Cord @ 3MTD of 3 furnaces (1 will be standby). The unit has two stack of emission quantity @ 150 mg per cubic metre. As per CTO the unit has been given consent for effluent of 0.7KL/day i.e. for Domestic. Industrial effluent (Quantity of Discharge 0.0)

3. Tyre Pyrolysis Process and Environmental Status:

The study was carried out during September 23 to 24, 2021. At the time of study only one reactor was operational. One complete cycle of TPO production took twenty-six (26) hrs approximately. The Scrap Tyres were de-banded and packed densely manually into the reactor chamber. The reactor is then heated to 150°C – 195°C (the temperature gauge was not calibrated, as the temperature gauge shows 100 °C at the time of loading). Initially wood and mixture of TPO and water is used for firing and starting of operation. After starting of process, the generated pyro gas is condensed and oil is recovered. The uncondensed pyro gas is further re-circulated for firing, after cut off of wood and mixture of TPO and water firing. The reactor is rotated slowly 2.5 RPM during the process. The condensed oil collected in the oil storage tanks connected to the individual condensers and stored in the final collection tank. The uncondensed pyro gas is recirculated for firing the reactor. The flue gas from the firing chamber is passed through one scrubber for operating reactor followed by the stack of 30mtrs height. After 6-7 hours of initial firing, production of pyro gas started and that was used as fuel for complete pyrolysis process. The production of oil starts at 150°C and continues till the temperature goes to 195°C. The oil passes through different condensers and finally into oil storage tank. After 09-10 hours of heating, cooling process take place for 12-13 hours than unloading of carbon black starts. The reactor has spiral arrangement for removal of Carbon Black Powder from reactor. The carbon black powder is stored in an underground room below the reactor.

During the monitoring around 6 Metric Tonne (MT) of de-banded waste tyres were fed manually into the reactor. The process involved

- Loading of de-banded waste tyres in the reactor
- Pyrolysis process
- Cooling Period
- Unloading of carbon black from the reactor
- Unloading of steel scrap

a. Ambient Air Quality Monitoring

The ambient air quality monitoring was carried out in four (04) locations by taking into considerations the predominant wind direction of the area (AAQ1 to AAQ4). The monitoring was carried out for PM₁₀, PM_{2.5}, VOCs & B (a) P using Respirable Dust Sampler (Envirotech, FLE No-709), Fine Particulate Sampler (Envirotech, FLE No-713), OVS Sampler (FLE-721). The air quality was monitored as 24 hourly average monitoring values. Google map showing location of monitoring stations is given below:

GOOGLE MAP SHOWING LOCATION PHOTOGRAPHS OF AIR QUALITY



Fig 1: Google Map showing location of the plant

MONITORING STATIONS



Fig 2: Showing (AAQMS) Ambient Air Quality Monitoring Stations

Ambient Air Quality Monitoring Results:

S. No	Parameters	AAQ1	AAQ2	AAQ3	AAQ4	NAAQS	Protocol Followed
1	Particulate Matter (PM _{2.5}), $\mu\text{g}/\text{m}^3$	33.16	50.03	53.99	45.80	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), $\mu\text{g}/\text{m}^3$	152.31	107.33	108.70	96.66	100	IS-5182(P-23)
3	Benzene, $\mu\text{g}/\text{m}^3$	6.99	8.24	03.91	4.22	5(Annual Std.)	FL/SOP/GC-46
4	Toluene, $\mu\text{g}/\text{m}^3$	44.12	39.82	13.06	15.69	NA	FL/SOP/GC-46
5	Xylene (p,o,m) ppm	61.99	95.29	21.92	8.27	NA	FL/SOP/GC-46
6	Benzo (a) Pyrene, ng/m^3	ND,[DL-0.5]	ND,[DL-0.5]	ND,[DL-0.5]	ND,[DL-0.5]	1(Annual Std.)	Method of Air- Sampling & Analysis (102)

- The levels of PM_{2.5} were within the prescribed standards at all four monitoring locations.
- The Levels of PM₁₀ were exceeding the prescribed standards in three locations i.e. AAQ1, AAQ2, & AAQ3. The value of PM₁₀ was highest at location AAQ1 located at Admin office roof. The PM₁₀ levels were in the range of 96.66 $\mu\text{g}/\text{m}^3$ to 152.31 $\mu\text{g}/\text{m}^3$
- VOCs have been analyzed in the terms of BTX i.e. Benzene, Toluene & Xylene
- The levels of Benzene appear to be on higher side at two locations i.e. at locations AAQ1 & AAQ2. The Benzene levels were in the range of 03.91 $\mu\text{g}/\text{m}^3$ to 8.24 $\mu\text{g}/\text{m}^3$. These are 24 hour values where as standard is annual average.
- The levels of Benzo (a) Pyrene were below detection limit.

SAMPLING LOCATION PHOTOGRAPHS OF AMBIENT AIR QUALITY MONITORING STATIONS

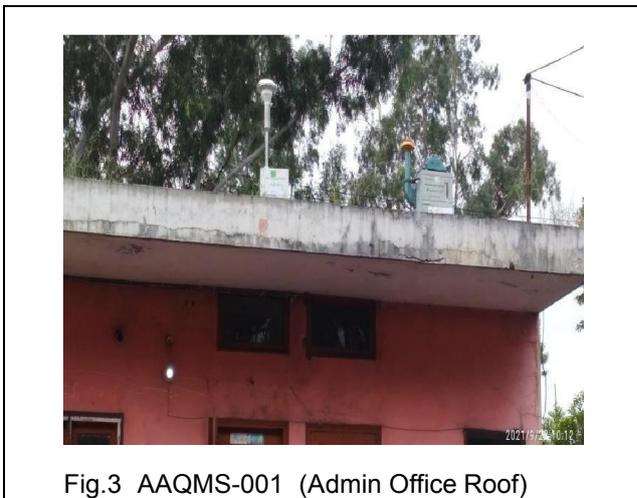


Fig.3 AAQMS-001 (Admin Office Roof)



Fig.4- AAQMS-003(Near Labour Yard)



Fig.5- AAQMS-002(Near Oil Storage Tank Area)



Fig.6- AAQMS-004(Back Side of Plant Area)

b. Work Zone Monitoring

The work zone monitoring was carried out as per the protocol w.r.t PM₁₀, PM_{2.5}, CO, VOCs & B(a)P. The work Zone monitoring was carried out at four locations inside the work place where reactor was installed (WZAQ1 to WZAQ4). The first location was setup near reactor 01. Second was near reactor no 02. Third was close to the reactor No.03 and fourth Back side of reactor No 04. The monitoring was carried out to cover the entire production process i.e. from loading of tyres in the reactors to unloading of carbon black and steel wire. The monitoring was carried out using Fine Particulate Sampler (Envirotech, FLE No-717 & 697),CO Analyzer(Ecotech FLE-149) OVS Sampler



Fig 7: Showing Work Place Air Quality Monitoring Sampling Stations

SHOWING SAMPLING LOCATION PHOTOGRAPHS OF WORK PLACE AIR QUALITY MONITORING STATIONS

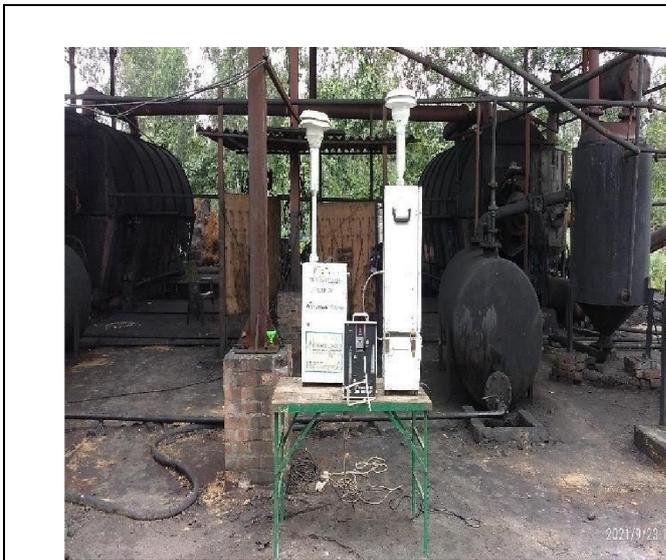


Fig.8 IAQMS-001 (Near Reactor No.01)



Fig.9 IAQMS-003 (Near Reactor No.03)



Fig.10 IAQMS-002 (Near Reactor No.02)



Fig.11 IAQMS-004 (Back side of Reactor No.04)

Result of work Zone Monitoring

S. No.	Parameters	WZAQ1	WZAQ2	WZAQ3	WZAQ4	OSHA 3430-04:2011 Standards	Indian Factory Act 1948	Test Method
1	Particulate matter (PM _{2.5}), µg/m ³	87.06	120.97	62.43	92	NA	NA	FL/SOP/ENV-19
2	Particulate matter (PM ₁₀), µg/m ³	111.88	191.28	133.33	167.07	NA	NA	FL/SOP/ENV-19
3	Benzene, ppm	9.11	12.04	8.25	8.66	1	10	FL/SOP/GC-46
4	Toluene, ppm	67.09	84.10	88.94	74.92	200	100	FL/SOP/GC-46
5	Xylene (p,o,m) ppm	108.64	226.68	155.39	119.39	100	100	FL/SOP/GC-46
8	Benzo (a) Pyrene, mg/m ³	ND[DL-0.02]	ND[DL-0.02]	ND[DL-0.02]	ND[DL-0.02]	0.2	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	6.20	6.20	6.13	5.93	50	40	FL/SOP/GC-25

- The levels of PM_{2.5} were in the range of 62.43 µg/m³ to 120.97 µg/m³. The highest value of 120.97 µg/m³ was observed in the station WZAQ2 which was on backside of the reactor.
- The levels of PM₁₀ were in the range of 111.88.14µg/m³ to 191.28 µg/m³. The highest levels were observed at WPAQ2.
- Monitoring of VOCs was done w.r.t BTX i.e Benzene, Toluene & Xylene. The level of Benzene at WZAQ2 was exceeding the prescribed standard at one location. The levels of Toluene were within the prescribed permissible limits of exposure limit (PEL) of OSHA and Indian Factory Act Standard 1948 at all the monitoring locations. The levels of Xylene were exceeding the prescribed standard at all locations
- The levels of Benzo (a) Pyrene were below detection limit.
- The levels of CO were within the prescribed under limit of Indian factory act 1948 as well as OSHA permissible exposure limits.
- Detailed analysis results are enclosed.

c. Analysis of Tyre Pyrolysis Oil

The detailed analysis of Tyre Pyrolysis was done as follows:

- **Detailed analysis of tyre pyrolysis oil** (as per schedule V part B of HOWM Rules 2016) in terms of its Sulphur content, calorific value, sediment, lead, arsenic, cadmium+ chromium+ nickel, PAH, Total halogens, PCBs, and water content.
- **Detailed compositional Analysis of TPO** w.r.t Carbon Number, specific gravity/density, Acidity on burner tip, flash point, boiling range, kinematic viscosity, CCR (Conradson carbon residue), Ash content, Pour Point, PONA (Paraffin, Olefins, Naphtha, Aromatics).
- During the study, the analysis of tyre pyrolysis oil (TPO) was also carried out. There is no specific standard prescribed for oil derived from waste/scrap tyres. So the TPO was compared with the parameters specified for fuel derived from the waste oil as notified in Hazardous and Other Waste (Management and transboundary) Rules, 2016 Schedule – V Part – B. The analysis of the TPO reveals that value of parameters are well within the limits prescribed for fuel derived from waste oil under schedule V part B of HoWM rules 2016.

Analysis result of Tyre Pyrolysis Oil

S. No.	Parameter	Test Result	Maximum Permissible limits	Protocol
1	Density, Kg/L	0.921	NS	IS-1448:P-16
2	Kinematic Viscosity @ 40°C , cSt	3.67	NS	IS-1448:P-25
3	Flash Point, °C	30	NS	IS-1448:P-21
4	Sulphur Content, % wt.	0.91	4.5	IS-1448:P-33
5	Conradson Carbon Residue (10% residue), % wt.	1.62	NS	IS-1448:P-122
6	Water Content, % wt.	0.19	1	ISO-12937
7	Total Halogens, ppm	286.4	4000	USEPA Method-9076
8	Carbon Number	C ₄ -C ₂₂	NS	FL/SOP/GC-97
9	Acidity on Burning Tip, mgKOH/g	0.165	NS	ISO 6618
10	Boiling Range, °C	80 to 305	NS	IS-1448: P-18
11	Ash Content, % wt.	0.005	NS	IS-1448: P-4
12	Pour Point, °C	>-30	NS	IS-1448:P-10
13	PONA (Paraffin, Olefins, Naphtha, Aromatics), % volume	69.87	NS	FL/SOP/GC-98
14	Calorific Value, Kcal/kg	7003.37	NS	IS-1448:P-6
15	Sediments, % wt.	0.0089	0.25	IS-1448:P-30
16	Lead, ppm	1.40	100	USEPA Method-3031
17	Cadmium, ppm	ND, [LOQ-0.3]	500	USEPA Method-3031
18	Chromium, ppm	17.80		USEPA Method-3031
19	Nickel, ppm	17.78		USEPA Method-3031
20	Arsenic, ppm	ND, [LOQ-0.3]	5	USEPA Method-3031
21	Polyaromatic Hydrocarbons (PAHs), % wt.	0.18	6	FL/SOP/HPLCP-31
22	Polychlorinated biphenyls (PCBs), ppm	ND,[LOQ-5]	5	FL/SOP/GCMS/P-04

d. Status of Environmental Concerns:

➤ Spillage and Fugitive emission of black carbon in the working area

At the end of pyrolysis process, the carbon black was unloaded into a storage tank built underground below the reactor. The unloading started without nitrogen purging. From the carbon black storage tank, the carbon black powder is filled manually into the bags for further use. Leakages and fugitive emissions observed during unloading of carbon black powder, as the reactor door and storage room did not have proper sealing. Fugitive emissions were also observed during unloading of steel wire scrap.

➤ **Escape of pyro gas**

The reactor gate was opened without nitrogen purging, this may lead to escaping of pyro gas into the environment.

Arrangement for nitrogen purging, installation of gas sensor for carbon monoxide (CO) and methane (CH₄) have to be made.

➤ **Flaring of excess Pyro gas.**

There is no system for flaring of excess pyro gas. The unit has arrangement for utilization of pyro gas generated from the pyrolysis operation at the reactor for self-heating. There is no arrangement of bypassing the pyro gas has been made in case of choking or blockage of vents inside the reactor during pyrolysis operation. No sensor system to track leakages were observed.

Arrangement of differential pressure gauge, sensors and alarm system (hooter) have to be made for emergency

➤ **Removal of Steel Scrap**

The steel scrap is removed in a mechanized manner and stored in the open storage yard. Removal of steel scrap from the reactor generates fugitive emission and exposes workers to fine carbon particle.

➤ **Waste Water treatment**

The unit used underground water for wet scrubber. **No ETP was found at the unit. There was no arrangement for treatment of waste water generated from scrubbers and condensers.**

➤ **Odor problem in plant and in neighborhood**

During study odor was observed in the scale of five (5) for during entire process, if measured in the scale of 1-10. As per the questionnaire survey carried out among nearby villagers & plant personals, some of nearby residents reported issue of odor and health problem due to operation of this unit.

➤ **Storage of raw material**

The scrap tyres were kept in open unpaved ground area in a haphazard manner.

➤ **Roads & Floors in the unit**

The open area of the plant was not cemented and was totally muddy due to rainfall at the time of study. The work zone had no concrete flooring and no pukka roads within the unit

➤ **Exposure of workers to fine carbon particles;**

Workers are provided with proper Personnel Protective Equipment (PPE) such as mask and boots. However, chances of exposure to fine carbon is there during unloading of steel scrap

➤ **Air Pollution Control System:**

The unit has one wet scrubber along with stack of 30m height for controlling flue gas emissions.

➤ **Scrubber and Stack for flue gas emission**

For controlling emissions from combustion of fuel used for firing and heating of the reactor, the unit has installed scrubber along with a stack of 30m height.

e. Health Survey

Surveys to assess health & odor issues were carried out through questionnaire. Survey was carried out for people residing within 1km radius of the unit and also with workers working in the unit.

- The survey of nearby residents carried out at the time of study reveals no health, dust or odor problems due to operation of the unit.

- Survey of workers of the unit also revealed no health issues due to working in the

4. Observation and recommendation for Improvement

Observations:

- During monitoring and sampling, the officials observed fugitive emission and odor during pyrolysis process. The odor value can be scaled as one (5) in the scale of 1 to 10.
- Fugitive emissions observed during unloading of steel scrap.
- The levels of PM₁₀ were exceeding the prescribed limit for ambient air at three locations.
- The levels of PM_{2.5} were within the prescribed limit for ambient air at four locations
- The levels of benzene were on higher side in the ambient air at two locations but cannot be compared with prescribed limit, which is an annual limit and in the present case the monitoring were carried out only for 24 hours.
- In the work zone there is no limit prescribed for PM₁₀ and PM_{2.5} under Air Act, 1981 or under E (P) Act 1986. In the Indian factory act 1948, limit for BTX has been provided.
- In the work zone the limit of Benzene was exceeding at one location as compared to prescribed limit, Toluene was within the prescribed limit, Xylene was exceeding prescribed limit under Indian factory act of 1948.
- The tyre pyrolysis oil (TPO) have a calorific value of above 7003.37 Kcal/kg.
- Compared with the limits prescribed for fuel oil derived from waste oil, the values for TPO is well within the limits.
- Carbon number of TPO appears to be from C₄ to C₂₂. The flash point is 30°C and the Sulphur content is 0.91 % and boiling range is 80 to 305.**

Recommendations:

- Provision for flaring of excess pyro gas and also the entire pyro gas in case of emergency has to be made.**
- A bypass system for bypassing pyro gas in case of blocking/choking of vent within the reactor be installed and to be connected with primary tank.**
- ETP has to be installed for treatment of process waste water generated from scrubbers and condensers etc.**
- Suction hood of sufficient capacity connected to air pollution control devices (APCDs) needs to be provided over the reactor gate and bagging area for reduction of fugitive emissions.**
- The entire pyrolysis operation be carried out through programmer logic controller (PLC) with adequate number of pressure and temperature gauge and with safety valves and bypass arrangements.**
- Adequate number of gas sensors (methane, carbon mono oxides and VOCs) along with alarm system (hooter) be installed within the work zone.**

- vii. Carbon black has to be bagged mechanically without any spillage and fugitive emission. Arrangement for preventing spillage and fugitive emission during transfer of carbon black from conveyor to bag be made.
- viii. Carbon black and steel recovered should be as per guidelines, without any spillage and fugitive emission.
- ix. Carbon black has to be bagged mechanically without any spillage and fugitive emission.
- x. Arrangement of suitable trays with wheels for transporting the steel scrap within the premise from generation points to storage points to be made to avoid spillage of carbon particle attached with steel scrap.
- xi. Waste tyre be kept in a shaded area.
- xii. Firefighting equipment be installed in adequate number.

Amit Kumar

Amit Kumar
SRF, WM-III Div

Tarun Darbari

Tarun Darbari
Scientist "D" WM-III Div

ENCLOSURE



U.P. Pollution Control Board

CONSENT ORDER

Ref No. - 60904/UPPCB/MuzaffarNagar(UPPCBRO)/CTO/air/MUZAFFARNA GAR/2019

Dated : 25/08/2019

To ,

Shri ASHISH VERMA
M/s MAHIE GREEN EARTH PRODUCT
Khasra No. 194, Vill. Nara, 9th Km., Meerut Road, Muzaffarnagar ,MUZAFFAR
NAGAR,251001
MUZAFFARNAGAR

Sub : Consent under section 21/22 of the Air (Prevention and control of Pollution) Act, 1981 (as amended) to M/s. MAHIE GREEN EARTH PRODUCT

Reference Application No. 5521794

Dated : 25/08/2019

1. With reference to the application for consent for emission of air pollutants from the plant of M/s MAHIE GREEN EARTH PRODUCT. under Air Act 1981. It is being authorised for said emissions, as per the standards, in environment, by the Board as per enclosed conditions .
2. This consent is valid for the period from 30/06/2019 to 31/07/2022 .
3. In spite of the conditions and provisions mentioned in this consent order UP Pollution Control Board reserves its right and powers to reconsider/amend any or all conditions under section 21 (6) of the Air (Prevention and Control of Pollution) Act, 1981 as amended.
This consent is being issued with the permission of competent authority .

For and on behalf of U.P. Pollution Control Board

**VIVEK
ROY**

Digitally signed
by VIVEK ROY
Date: 2019.08.25
11:14:22 +05'30'

**Regional Officer
UPPCB, Muzaffarnagar**

**Enclosed : As above
(condition of consent):**

Copy to:

**Regional Officer
UPPCB, Muzaffarnagar**

U.P. Pollution Control Board

Dated : 25/08/2019

CONDITIONS OF CONSENT

1. This consent is valid only for the approved production capacity of Fuel Oil 8 MTD, Carbon Black 8 MTD, Steel Wire 3 MTD .
2. This consent is valid only for products and quantity mentioned above. Industry shall obtain prior approval before making any modification in product/ process /fuel/ plant machinery failing which consent would be deemed void.
- 3(a) The maximum rate of emission of flue gas should not be more than the emission norms for the stacks.
- 3(b) Air Pollution Source Details.

Air Pollution Source Details					
S.No	Air Pollution Source	Type of Fuel	Stack No.	Parameters	Height
1	Heating Furnace	Fuel Oil	01	Particulate Matter	30 M. above from Ground Level
2	Heating Furnace (02 Nos.)	Fuel Oil	02	Particulate Matter	30 M. above from Ground Level

- 3(c) The emissions by various stacks into the environment should be as per the norms of the Board .

Emission Quality Details Detail			
S.No	Stack No	Parameter	Standard
1	01	Particulate Matter	150 MG PER NORMAL CUBIC METER
2	02	Particulate Matter	150 MG PER NORMAL CUBIC METER

4. Quantity of other pollutants should also be as per the norms prescribed by the Board/MOEF & CC/or otherwise mandatory .
5. The equipment for air pollution control system and monitoring ,as proposed by the industry and approved by the Board should be installed in their premises itself .
6. The modification or installation in the existing pollution control equipments should be done only by prior approval of Board .
7. The operation of air pollution control system and maintenance be done in such a way that the quantity of pollutants should be in accordance with the standards prescribed by the Board/MoEF & CC/or otherwise mandatory .
8. Unit should do provisions for fugitive emissions chimney/stack as per the norms of the Board/MOEF & CC/or otherwise mandatory .
9. The unit should submit the stack emissions monitoring report within one month from issuance of consent order along with the point wise compliance report of the consent order . Further quarterly monitoring report should be submitted .

Specific Conditions:

1. Industry shall submit quarterly monitoring reports of all stacks and ambient air quality from a certified/approved laboratory.
2. This consent is valid only for production of Fuel Oil 8 MTD, Carbon Black 8 MTD, Steel Wire 3 MTD ONLY (After Expansion) by using 03 heating furnace (01 will be standby).
3. Industry shall comply with various Waste Management Rules as notified by MoEf&CC i.e. Plastic Waste Management Rules, 2016, Solid Waste Management Rules, 2016, Hazardous and Other Wastes (Management and Transboundary) Rules, 2016, E-waste (Management) Rules, 2016, Construction and Demolition Waste Management Rules, 2016.
4. Unit should develop minimum green belt 20 meter wide around premises or 33% total area of land whichever is minimum, covered by the plantation of tall trees of suitable species as per the guidelines set up by the Board vide its Office Order no.H- 16405/220/2018/02 dt. 16/02/2018. The copy of this guideline is available at URL http://www.uppcb.com/pdf/Green-Belt-Guide_160218.pdf.
5. This consent is valid only for products and quantity mentioned above. Industry shall obtain prior approval before making any modification in product/process/fuel/plant machinery failing which consent would be deemed void.
6. Exhaust stack of DG set of 62.5 KVA should have 2.0 meter high above from nearest roof top. For control of noise, acoustic enclosure should be installed on DG Set.
7. Industry shall abide by directions given by Hon'ble Supreme Court, High Court, National Green Tribunals, Central Pollution Control Board and Uttar Pradesh Pollution Control Board for protection and safeguard of environment from time to time.
8. Industry shall use only liquid fuel/gaseous fuel for heating furnace.
9. The unit should be operated in fully covered shed.
10. The unit shall be operated in an environment friendly and sustainable manner and should not have any adverse impact on surrounding environment.
11. In case of violation of above mentioned conditions or received any public complaint and found correct, the consent shall be withdrawn.

Issued with the permission of competent authority .

For and on behalf of U.P. Pollution Control Board .

VIVEK Digitally signed
by VIVEK ROY
Date: 2019.08.25
ROY 11:14:39 +05'30' **Regional Officer**
UPPCB, Muzaffarnagar



U.P. Pollution Control Board

CONSENT ORDER

**Ref No. - 60903/UPPCB/MuzaffarNagar(UPPCBRO)/CTO/
water/MUZAFFARNAGAR/2019**

Dated : 25/08/2019

To ,

Shri ASHISH VERMA
M/s MAHIE GREEN EARTH PRODUCT
Khasra No. 194, Vill. Nara, 9th Km., Meerut Road, Muzaffarnagar ,MUZAFFAR
NAGAR,251001
MUZAFFARNAGAR

**Sub : Consent under Section 25/26 of The Water (Prevention and control of Pollution) Act, 1974
(as amended) for discharge of effluent to M/s. MAHIE GREEN EARTH PRODUCT**

Reference Application No :5521742

Dated :25/08/2019

1. For disposal of effluent into water body or drain or land under The Water (Prevention and control of Pollution) Act,1974 as amended (here in after referred as the act) M/s. MAHIE GREEN EARTH PRODUCT is hereby authorized by the board for discharge of their industrial effluent generated through ETP for irrigation/river through drain and disposal of domestic effluent through septic tant/soak pit subject to general and special conditions mentioned in the annexure ,in refrence to their foresaid application .
2. This consent is valid for the period from 30/06/2019 to 31/07/2022 .
3. In spite of the conditions and provisions mentioned in this consent order UP Pollution Control Board reserves its right and powers to reconsider/amend any or all conditions under section 27(2) of the Water (Previnion and Controt of Pollution) Act, 1974 as amended .

This consent is being issued with the permission of competent authority .

For and on behalf of U.P. Pollution Control Board

**VIVEK
ROY**

Digitally signed
by VIVEK ROY
Date: 2019.08.25
11:15:00 +05'30'

**Regional Officer
UPPCB, Muzaffarnagar**

**Enclosed : As above
(condition of consent):**

Copy to:

**Regional Officer
UPPCB, Muzaffarnagar**

U.P. POLLUTION CONTROL BOARD, LUCKNOW

Annexure to Consent issued to M/s.MAHIE GREEN EARTH PRODUCT vide

Consent Order No. 5521742/ Water

Dated : 25/08/2019

CONDITIONS OF CONSENT

1. This consent is valid only for the approved production capacity of Fuel Oil 8 MTD, Carbon Black 8 MTD, Steel Wire 3 MTD .

2. The quantity of maximum daily effluent discharge should not be more than the following :

Effluent Discharge Details			
S.No	Kind of Effluent	Maximum daily discharge,KL/day	Treatment facility and discharge point
1	Domestic	0.7	Septic Tank

3. Arrangement should be made for collection of water used in process and domestic effluent separately in closed water supply system. The treated domestic and industrial effluent if discharged outside the premises, if meets at the end of final discharge point, arrangement should be made for measurement of effluent and for collecting its sample. Except the effluent informed in the application for consent no other effluent should enter in the said arrangements for collection of effluent. It should also be ensured that domestic effluent should not be discharged in storm water drain .

- 4(a) The domestic effluent should be treated in treatment plant so that the should be in conformity with the following norms dated treated effluent .

Domestic Effluent		
S.No	Parameter	Standard

- 4(b) The industrial effluent should be treated in treatment plant so that the treated effluent should be in conformity with the following norms. .

Industrial Effluent		
S.No	Parameter	Standard
1	Quantity of Discharge	0.0

5. Effluent generated in all the processes, bleed water, cooling effluent and the effluent generated from washing of floor and equipments etc should be treated before its disposal with treated industrial effluent so that it should be according to the norms prescribed under The Environment (Protection) Act,1986 or otherwise mandatory .
6. The other pollutant for which norms have not been prescribed, the same should not be more than the norms prescribed for the water used in manufacturing process of the industry .
7. The method for collecting industrial and domestic effluent and its analysis should be as per legal Indian standards and its subsequent amendments/standards prescribed under The Environment (Protection) Act, 1986.
8. The treated domestic and industrial effluent be mixed (as per the provisions of Condition No. 2) and disposed of on one disposal point. This common effluent disposal point should have arrangement for flow meter/V Notch for measuring effluent and its log book be maintained .

Specific Conditions:

1. Unit should not discharge any kind of industrial effluent. This consent is valid only for domestic discharge. Scrubbing water shall be recycled.
2. This consent is valid only for production of Fuel Oil 8 MTD, Carbon Black 8 MTD, Steel Wire 3 MTD ONLY (After Expansion) by using 03 heating furnace (01 will be standby).
3. Unit should comply the provisions of Water (Prevention and Control of Pollution) Act 1974 as Amended and Environment (Protection) Act, 1986, and direction issued by Hon'ble National Green Tribunal, New Delhi.
4. Unit should develop minimum green belt 20 meter wide around premises or 33% total area of land whichever is minimum, covered by the plantation of tall trees of suitable species as per the guidelines set up by the Board vide its Office Order no.H- 16405/220/2018/02 dt. 16/02/2018. The copy of this guideline is available at URL http://www.uppcb.com/pdf/Green-Belt-Guide_160218.pdf.
5. The Board have right to modify any condition as & when require in compliance of any change in environmental guide lines and Hon'ble courts orders passed time to time.
6. Industry shall comply with various Waste Management Rules as notified by MoEf&CC i.e. Plastic Waste Management Rules, 2016, Solid Waste Management Rules, 2016, Hazardous and Other Wastes (Management and Transboundary) Rules, 2016, E-waste (Management) Rules, 2016, Construction and Demolition Waste Management Rules, 2016
7. This consent is valid only for products and quantity mentioned above. Industry shall obtain prior approval before making any modification in product/process/discharge/plant machinery failing which consent would be deemed void.
8. Industry shall abide by directions given by Hon'ble Supreme Court, High Court, National Green Tribunals, Central Pollution Control Board and Uttar Pradesh Pollution Control Board for protection and safeguard of environment from time to time.
9. Industry shall use only liquid fuel/gaseous fuel for heating furnace.
10. The unit should be operated in fully covered shed.
11. The unit shall be operated in an environment friendly and sustainable manner and should not have any adverse impact on surrounding environment.
12. In case of violation of above mentioned conditions or received any public complaint and found correct, the consent shall be withdrawn.

Issued with the permission of competent authority .

For and on behalf of U.P. Pollution Control Board .

**VIVEK
ROY**

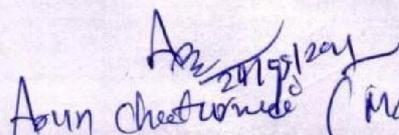
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by VIVEK ROY
Date: 2019.08.25
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**Regional Officer
UPPCB, Muzaffarnagar**

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Ashok Kumar
2.	Age/ Gender	Male / 46
3.	Address /Contact number	Dhaulpur village Muzaffar Nagar +918439590395.
4.	Proximity of person from unit	1 KM
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes slight odour / dust Problem (we will give 7 marks out of 10).
6.	Specify if the person has any Health issue. Also mention duration	no any health issue but crops have not come in the crops and in the mango orchard for two years due to pollution.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	Only the Tyre recycling plant alone is not responsible, the adjacent plant should also be investigated.

Date 24/09/2021
Place Dhaulpur village Muzaffar Nagar
U.P.


 Anur Chaturvedi (Manager)
 Name & designation of inspecting officer



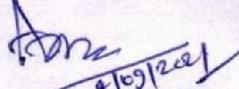
Ashok Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Mool Raj
2.	Age/ Gender	82 / Male
3.	Address /Contact number	Ratan Deep Farm Dhaulpur Village, Muzaffarnagar
4.	Proximity of person from unit	1 km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Slight Odor / dust Problem facing last 2 years (will give them 7 marks out of 10)
6.	Specify if the person has any Health issue. Also mention duration	Asthmatic problem / Breathing difficulties are facing last 2 years.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	-

Date 24/09/2021

Place Dhaulpur Near Farni Ratanpur
Muzaffarnagar J.P.


 Arun Chaturvedi (Manager)
 Name & designation of inspecting officer



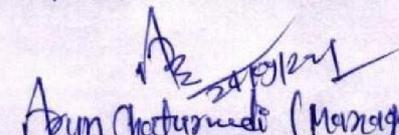
Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Shubhshy
2.	Age/ Gender	49/ male
3.	Address /Contact number	Dhaulpur village muzaffarpur V.P.
4.	Proximity of person from unit	1 K.M.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Slight odour/ dust Problem (we will give 7 marks out of 10)
6.	Specify if the person has any Health issue. Also mention duration	no any health problem all good.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	Regulatory body should be regularly monitor them and hand them over to whom they follow.

Date 24/09/21

Place Dhaulpur village muzaffarpur
V.P.


 Apur Chaturvedi (Manager)
 Name & designation of inspecting officer



-6/8-

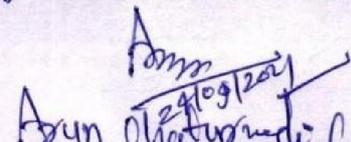
Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Manoj Kumar
2.	Age/ Gender	26 / Male
3.	Address /Contact number	Jaroda, village muzaffar Nagar +918126269008
4.	Proximity of person from unit	1 km
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes facing slight odour/dust (we will give the 6 marks out of 10)
6.	Specify if the person has any Health issue. Also mention duration	All good no any health related issue.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	Regulatory body should be regularly monitor them and hand them over to whom they follow.

Date 24/09/2021

Place Jaroda village muzaffar Nagar
V.P.


 Arun Chaturvedi (Manager)
 Name & designation of inspecting officer



-6/8-

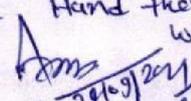
Arun Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Devi Singly
2.	Age/ Gender	58 / male
3.	Address /Contact number	Jaroda Muzaffar nagar U.P.
4.	Proximity of person from unit	1 km.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Slight Odor/dust Problem, (will give them 8 mark out of 10)
6.	Specify if the person has any Health issue. Also mention duration	no any helthy Problem.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	A Zone should be created for them and do something which will reduce the pollution, regulatory body should regularly monitor them and Hand them over to whom they follow.

Date 24/09/2021

Place Jaroda village Muzaffar nagar
U.P.


 Arun Chaturvedi (Manager)
 Name & designation of inspecting officer



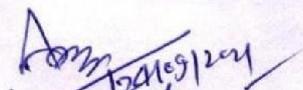
Arun Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Dharampal
2.	Age/ Gender	54/ Male
3.	Address /Contact number	Vill - Jandya, Muzaffarnagar 91 9557 60 19 17
4.	Proximity of person from unit	1 km.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes facing slight odour and dust problem.
6.	Specify if the person has any Health issue. Also mention duration	No any health issue. all good.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	No any issue this particulate plant several other industries also responsible air pollution this areas.

Date 24/05/2024

Place Jandya village, Muzaffarnagar
U.P.


 Arun Chaturvedi (Manager)
 Name & designation of inspecting officer



-6/8-

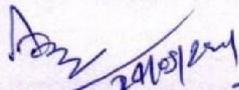
Arund Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Dharmendran kumar
2.	Age/ Gender	46/ male
3.	Address /Contact number	Jwodo Muzaffar nagar Uttar Pradesh / +91 9997695912
4.	Proximity of person from unit	01 km -
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	no any issue all good. But slight odor observed during night (4 of 10 marks)
6.	Specify if the person has any Health issue. Also mention duration	No any health issues -
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	All good no any issue.

Date 24/09/2021

Place Jwoda village, Muzaffar Nagar
U.P.


 Anam Chatterjee (Manager)
 Name & designation of inspecting officer



-6/8-

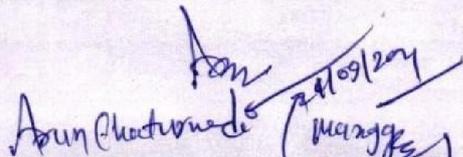
Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Rajwey
2.	Age/ Gender	68 / Male
3.	Address /Contact number	Ratandeep farm Near Dhaulpur Muzaffarnagar, U.P.
4.	Proximity of person from unit	1 k.m.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes facing odour / dust problems (will give the 8 marks - out of 10)
6.	Specify if the person has any Health issue. Also mention duration	no any health problems all good.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not ,	—
8.	Any feedback	—

Date 24/09/2021

Place Dhaulpur Muzaffarnagar
U.P.


 Anur Chakravarti (Manager)
 Name & designation of inspecting officer



-6/8-

Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Sushil Malik
2.	Age/ Gender	56/ Male
3.	Address /Contact number	Ratundeep Farm, Near Dhaulapur Muzaffarnagar U.P. / +91 8869 805891
4.	Proximity of person from unit	1 KM.
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes facing odor problem since 2 years (8 marks - out of 10)
6.	Specify if the person has any Health issue. Also mention duration	Yes facing asthmatic and breathing difficulties. last 2 years,
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	-
8.	Any feedback	A zone should be created for them and do something which will reduce the pollution, since two years there is no fruit in the mango orchard, so I want to say that regulatory body please provide the solutions.

Date 24/09/2021

Place Dhaulapur Muzaffarnagar U.P.

Name & designation of inspecting officer



-6/8-

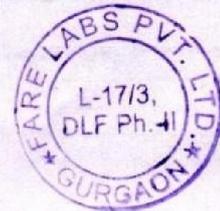
Anand Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius))

No.	Head	Details
1.	Name	Mr. Raju Kumar
2.	Age/ Gender	34 / Male
3.	Address /Contact number	Ratandeep Farm Near Dhaulpur village Muzaffar Nagar
4.	Proximity of person from unit	1 km .
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes facing slight odour/dust problems .
6.	Specify if the person has any Health issue. Also mention duration	no any health issue.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	—

Date 24/09/2021
 Place M/S Mahie Green Earth Products
 9 KM Stone Meenut Road
 Muzaffar Nagar U.P.

Arum Chaturvedi (Manager)
 Name & designation of inspecting officer



-6/8-

Arum Kumar

Questionnaire -1 (For persons in adjoining areas (within 1 km radius)

No.	Head	Details
1.	Name	Mr. Raju Kumar
2.	Age/ Gender	34 / Male
3.	Address /Contact number	Aartideep Farm Near Dhaupta village Muzaffar Nagar
4.	Proximity of person from unit	1 km .
5.	Whether facing any problem of odour or dust? If yes, then rate in scale of 1 to 10	Yes facing slight odour/dust Problem .
6.	Specify if the person has any Health issue. Also mention duration	no any health issue.
7.	In case of any health issue, whether the person attributing the same to nearby pyrolysis units or not	—
8.	Any feedback	—

Date 24/09/2021

Place M/s Mahie Green Earth Products
9 KM Stone Meenut Road
Muzaffar Nagar U.P.

Arum Chaturvedi (Manager)
Name & designation of inspecting officer



-6/8-

Arum Kumar

Annexure-: B Health survey questionnaires for workers to factory premises

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mrs. Sharwan
2.	Age / Gender	28 / Male
3.	Address /Contact Number	Plant Premises. A9 / 9634283854
4.	Designation	Plant worker
5.	Work profile	Scrap unloading
6.	Working since how many years?	1 Month
7.	Whether using PPE Kit	Yes used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All Good. No any health issue.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date

24/09/2021

Place

M/S Mahie Green Party
Product 9 KM stone near
Road Muzaffar Nagar, U.P.

Name & designation of inspecting officer

Arjun Choudhary (Munir)



-7/8-

Aravind Kumar

Questionnaire -2 (For workers of the unit)

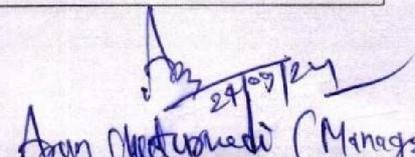
No.	Head	Details
1.	Name	Mr. shajal
2.	Age / Gender	18/Male
3.	Address /Contact Number	plant premises. +916397101502
4.	Designation	Plant worker
5.	Work profile	loading/unloading
6.	Working since how many years?	10 days
7.	Whether using PPE Kit	yes used
8.	Work duration ?	8-10 hrs.
9.	Health condition (Details)	All good no any health problem.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date

29/09/2021

Place

M/S Mahie Green Empty Product


 Anand Kaurvedi (Manager)
 Name & designation of inspecting officer



-7/8-

Anand Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Deepak
2.	Age / Gender	21 / Male
3.	Address / Contact Number	Plant Premises #91730057873755
4.	Designation	Plant worker
5.	Work profile	Loading / unloading
6.	Working since how many years?	1 month
7.	Whether using PPE Kit	yes used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All Good no any health issue.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/05/2021

Place

M/s Mahic Green Earth Products
9 Km Stone Meerut Road Meerut Noida
U.P.

Name & designation of inspecting officer

Az
24/05/2021
Ajay Chaturvedi (Manager)



-7/8-

Arav Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Surendra Bhusal .
2.	Age / Gender	36 / Male
3.	Address /Contact Number	Plant premises +91 9897791768
4.	Designation	Plant worker
5.	Work profile	Loading / unloading .
6.	Working since how many years?	1 month's
7.	Whether using PPE Kit	Yes used -
8.	Work duration ?	8 - 10 Hrs .
9.	Health condition (Details)	All Good .
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/09/2021
 Place M/s Makie Green Earth
 Products of Khy stone Meenat
 Road Muzaffar Nagar

A3/24/09/2021
 Anur Chaturvedi (Manager)
 Name & designation of inspecting officer



Hrishi Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Mahesh
2.	Age / Gender	22 / Male
3.	Address /Contact Number	Plant Premises. 917300573755
4.	Designation	Plant worker
5.	Work profile	loading / Tyre cutting
6.	Working since how many years?	10 days.
7.	Whether using PPE Kit	yes. used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All good. no any health problem.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/05/2021

Place M/S Mahre Green Earth
Products 9 KM stone
Meerut Road Meerut Nagar
U.P.

Asst. Manager
24/05/2021
Ajay Chaturvedi (Manager)
Name & designation of inspecting officer



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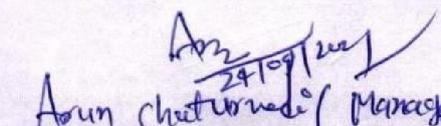
Naval Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Raj Kumar
2.	Age / Gender	31 / Male
3.	Address /Contact Number	Plant Premises. +919335092467
4.	Designation	Plant worker
5.	Work profile	Loading unloading
6.	Working since how many years?	1 months.
7.	Whether using PPE Kit	Yes used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All Good. no any health problem.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/09/2021

Place M/s Mahie Earty Products
9 KM Meerut Road Muzaffar Nagar
U.P.


 Anun Chaturvedi (Manager)
 Name & designation of inspecting officer



Raj Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Furkan
2.	Age / Gender	23 / Male
3.	Address /Contact Number	Plant Premises 49 / 6395421839
4.	Designation	Plant worker
5.	Work profile	loading / unloading
6.	Working since how many years?	1 month.
7.	Whether using PPE Kit	Yes used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All Good no any with related issues.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/09/2021

Place M/s Mahir Green Earth Products
9 KM stone Meerut Road
Muzaffar Nagar

(Signature)
24/09/2021
Arjun Choudhary (Manager)
Name & designation of inspecting officer



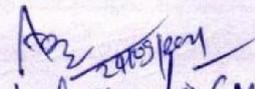
(Signature)
Aravind Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Hariom Singh
2.	Age / Gender	24 / Male
3.	Address / Contact Number	Plant premises. +91 6395 421 839
4.	Designation	labor / Plant worker
5.	Work profile	Loading / unloading
6.	Working since how many years?	1 month
7.	Whether using PPE Kit	Yes used.
8.	Work duration ?	8-10 Hrs.
9.	Health condition (Details)	All good no any health problem.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/09/2021

Place M/S Mahie Green Earth
Products of Kalyan stone near road
Mazra Nigaz J.P.


 Arun Chatterjee (Manager)
 Name & designation of inspecting officer



-7/8-

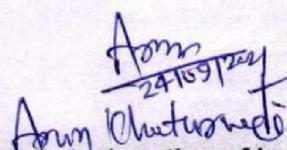
Arun Kumar

Questionnaire -2 (For workers of the unit)

No.	Head	Details
1.	Name	Mr. Manoj Yadav
2.	Age / Gender	28 / Male
3.	Address /Contact Number	Plant Premises. +91 989815 0056
4.	Designation	Security Guard.
5.	Work profile	Security of the Plant
6.	Working since how many years?	2 years
7.	Whether using PPE Kit	Yes. used.
8.	Work duration ?	24*7
9.	Health condition (Details)	All good no any health Problem
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	—

Date 24/09/2021

Place M/S Mahie Green earthy Products
9 Km stone meet road Muzaffar Nagar
D.P.


 Anam Chaturvedi (Manager)
 Name & designation of inspecting officer



Anand Kumar

Questionnaire -2 (For workers of the unit)

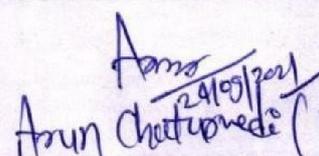
No.	Head	Details
1.	Name	Mr. Mukesh Kumar
2.	Age / Gender	24 / Male
3.	Address /Contact Number	Plant Premises.
4.	Designation	Plant Operator
5.	Work profile	operating plant daily Plant running
6.	Working since how many years?	1 month
7.	Whether using PPE Kit	Yes used during work.
8.	Work duration ?	8-10 hrs.
9.	Health condition (Details)	All good no any health related issues.
10.	In case of any health issues, specify duration of illness?	—
11.	Any feedback	All good no any issues.

Date

24/09/2021

Place

M/S Mahie Green earth
Products 9 km stone Meerut
Road Muzaffar Nergau. U.P.


 Arun Chaturvedi (Manager)
 Name & designation of inspecting officer



Mukesh Kumar

TEST REPORT

Issued to: Central Pollution Control Board
 Parivesh Bhawan, East Arjun Nagar,
 Delhi-110032

J.O. No.: ENV20210925-008-016
 ULR Code: TC5503 21 3 00006838 F
 Report Date: 27-09-2021
 Sample receipt Date: 25-09-2021
 Account Manager: Vartika Khandelwal
 Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample
 Date of Sampling
 Time of Sampling
 Test Started On
 Test Completed On
 Purpose of Monitoring
 Method of Sampling
 Company Location
 Sampling Location
 Avg. Flow Rate of Air RSPM/SPM (m³/min)
 Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)
 Longitude & Latitude
 Ambient Temperature (°C)
 Sampling Duration (Hrs.)
 Equipment Used Details

: Ambient Air Quality
 : 23-09-2021 to 24-09-2021
 : 12:20 PM to 12:35 PM
 : 25-09-2021
 : 27-09-2021
 : To Assess Pollution Load
 : IS-5182 (P-14) & FL/SOP/ENV/D-01
 : M/S Mahie Green Earth Products, 9KM Store Meerut
 Road Muzaffarnagar, U.P.
 : AAQ – 001(Near Admin Office Roof)
 : 1.15
 : 1
 : N 29.389252, E 77.702018
 : 34
 : 24 Hrs. & 8 Hrs.
 : Respirable Dust Sampler (Envirotech, FLE No-694)
 Fine Particulate Sampler (Envirotech, FLE
 No-697), OVS Sampler (FLE-723)
 : Sunny partly cloudy, during monitoring raining was going
 on 8PM to 6AM



Weather Condition

Analysis Report

S. No.	Parameters	Test Results	NAAQS*	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	33.16	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	152.31	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	6.99	5	FL/SOP/GC-46
4	Toluene, µg/m ³	44.12	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	27.10	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	34.89	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND,[DL-0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND, [DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Conforms** to NAAQS 2009 Except for **PM10 & Benzene.**

Reviewed By

(AUTHORISED SIGNATORY)

Page 1 of 1

D Mathur, Director

NOTE: The laboratory accepts the responsibility for content of report. The results contained in this TEST REPORT related only to the sample tested. TEST REPORT shall not be reproduced except in full, without written approval of the laboratory. This report is intended only for your guidance and not for legal purpose or for advertisement. Samples will be destroyed after 15 days from the date of issue of test certificate unless otherwise specified. Any complaints about this report should be communicated in writing within 7 days of issue of this report. Total liability at FARELABS Pvt. Ltd. is limited to invoiced amount only.

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TEST REPORT

Issued to: Central Pollution Control Board
 Parivesh Bhawan, East Arjun Nagar,
 Delhi-110032

J.O. No.: ENV20210925-008-017
 ULR Code: TC5503 21 3 00006839 F
 Report Date: 27-09-2021
 Sample receipt Date: 25-09-2021
 Account Manager: Vartika Khandelwal
 Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample
 Date of Sampling
 Time of Sampling
 Test Started On
 Test Completed On
 Purpose of Monitoring
 Method of Sampling
 Company Location

: Ambient Air Quality

: 23-09-2021 to 24-09-2021
 : 12:30 PM to 12:45 PM
 : 25-09-2021
 : 27-09-2021
 : To Assess Pollution Load
 : IS-5182 (P-14) & FL/SOP/ENV/D-01
 : M/S Mahie Green Earth Products, 9KM Store Meerut
 Road Muzaffarnagar, U.P.
 : AAQ – 002 (Near Labour Yard Area)
 : 1.1
 1
 : N 29.389252, E 77.702018
 34
 : 24 Hrs. & 8 Hrs.
 : Respirable Dust Sampler (Envirotech, FLE No-703)
 Fine Particulate Sampler (Envirotech, FLE
 No-711), OVS Sampler (FLE-724)
 : Sunny partly cloudy, during monitoring raining was going
 on 8PM to 6AM



Sampling Location

Avg. Flow Rate of Air RSPM/SPM (m³/min)
 Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)
 Longitude & Latitude
 Ambient Temperature (°C)
 Sampling Duration (Hrs.)
 Equipment Used Details

Weather Condition

Analysis Report

S. No.	Parameters	Test Results	NAAQS*	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	50.03	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	107.33	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	8.24	5	FL/SOP/GC-46
4	Toluene, µg/m ³	39.82	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	59.10	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	36.19	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND, [DL-0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND, [DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **conforms** to NAAQS 2009 except for **PM10 & Benzene**.

Reviewed By

Page 1 of 1

(AUTHORISED SIGNATORY)
 D Mathur, Director

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TEST REPORT

Issued to: Central Pollution Control Board
 Parivesh Bhawan, East Arjun Nagar,
 Delhi-110032

J.O. No.: ENV20210925-008-018
 ULR Code: TC5503 21 3 00006840 F
 Report Date: 27-09-2021
 Sample receipt Date: 25-09-2021
 Account Manager: Vartika Khandelwal
 Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample
 Date of Sampling
 Time of Sampling
 Test Started On
 Test Completed On
 Purpose of Monitoring
 Method of Sampling
 Company Location
 Sampling Location
 Avg. Flow Rate of Air RSPM/SPM (m³/min)
 Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)
 Longitude & Latitude
 Ambient Temperature (°C)
 Sampling Duration (Hrs.)
 Equipment Used Details

: Ambient Air Quality
 : 23-09-2021 to 24-09-2021
 : 12:40 PM to 12:55 PM
 : 25-09-2021
 : 27-09-2021
 : To Assess Pollution Load
 : IS-5182 (P-14) & FL/SOP/ENV/D-01
 : M/S Mahie Green Earth Products, 9KM Store Meerut
 Road Muzaffarnagar, U.P.
 : AAQ – 003 (Oil Storage Tank Area)
 : 1.14
 : 1
 : N 29.389252, E 77.702018
 : 34
 : 24 Hrs. & 8 Hrs.
 : Respirable Dust Sampler (Envirotech, FLE No-709)
 Fine Particulate Sampler (Envirotech, FLE
 No-698), OVS Sampler (Envirotech, FLE-721)
 : Sunny partly cloudy, during monitoring raining was going
 on 8PM to 6AM



Weather Condition

Analysis Report

S. No.	Parameters	Test Results	NAAQS*	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	53.99	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	108.70	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	03.91	5	FL/SOP/GC-46
4	Toluene, µg/m ³	13.06	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	06.79	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	15.13	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND, [DL-0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND, [DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **conforms** to NAAQS Except for **PM10**

Reviewed By

(AUTHORISED SIGNATORY)

Page 1 of 1

D Mathur, Director

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FARELABS

FOOD ANALYSIS & RESEARCH LABORATORY

TESTING, CALIBRATION, PROFICIENCY TESTING, R&D & TRAINING SERVICES
TEST REPORT



FARE LABS Private Limited
L-17/3, DLF Phase-II, IFFCO Chowk, M.G. Road,
Gurgaon-122002, Haryana, INDIA
Phone : +91-124-4223207, 4034205
Fax : +91-124-4036038, Cell : +91-95992 21227
E-mail : farelabs@farelabs.com
Website : www.farelabs.com

J.O. No.: ENV20210925-008-019
ULR Code: TC5503 21 3 00006841 F
Report Date: 27-09-2021
Sample receipt Date: 25-09-2021
Account Manager: Vartika Khandelwal
Credit Manager: Septesh/Gulab Singh

Issued to: Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar,
Delhi-110032

Sample Particulars:

Nature of the Sample	: Ambient Air Quality
Date of Sampling	: 23-09-2021 to 24-09-2021
Time of Sampling	: 12:50 PM to 01:05 PM
Test Started On	: 25-09-2021
Test Completed On	: 27-09-2021
Purpose of Monitoring	: To Assess Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-01
Company Location	: M/S Mahie Green Earth Products, 9KM Store Meerut Road Muzaffarnagar, U.P.
Sampling Location	: AAQ-04 (Back Side of Plant)
Avg. Flow Rate of Air RSPM/SPM (m ³ /min)	: 1.1
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 29.389252, E 77.702018
Ambient Temperature (°C)	: 34
Sampling Duration (Hrs.)	: 24 Hrs. & 8 Hrs.
Equipment Used Details	: Respirable Dust Sampler (Envirotech, FLE No-691) Fine Particulate Sampler (Envirotech, FLE No-696), OVS Sampler (Envirotech FLE-724)
Weather Condition	: Sunny partly cloudy, during monitoring raining was going on 8PM to 6AM



Analysis Report

S. No.	Parameters	Test Results	NAAQS*	Protocol Followed
Particulate Matters				
1	Particulate Matter (PM _{2.5}), µg/m ³	45.80	60	FL/SOP/ENV-01
2	Particulate Matter (PM ₁₀), µg/m ³	96.66	100	IS-5182(P-23)
Total Volatile Organic Compounds (TVOC)				
3	Benzene, µg/m ³	4.22	5	FL/SOP/GC-46
4	Toluene, µg/m ³	15.69	NA	FL/SOP/GC-46
5	p-Xylene, µg/m ³	1.33	NA	FL/SOP/GC-46
6	o-Xylene, µg/m ³	6.94	NA	FL/SOP/GC-46
7	m-Xylene, µg/m ³	ND, [DL-0.02]	NA	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, ng/m ³	ND, [DL-0.5]	1	Method of Air-Sampling & Analysis (102)

NOTE: FL/SOP/ENV-01 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)

*NAAQS - National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

Inference: The tested sample of Ambient Air for above mentioned location **Conforms** to NAAQS 2009

Reviewed By

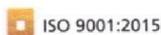
(AUTHORISED SIGNATORY)
D Mathur, Director

Page 1 of 1

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FL/T/GEN/F-05



TEST REPORT

Issued to: Central Pollution Control Board
 Parivesh Bhawan, East Arjun Nagar,
 Delhi-110032

J.O. No.: ENV20210925-009-020
 ULR Code: TC5503 21 3 00006842 F
 Report Date: 27-09-2021
 Sample receipt Date: 25-09-2021
 Account Manager: Vartika Khandelwal
 Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 23-09-2021 to 24-09-2021
Time of Sampling	: 11:35 AM to 11:50 AM
Test Started On	: 25-09-2021
Test Completed On	: 27-09-2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: M/S Mahie Green Earth Products, 9KM Store Meerut Road Muzaffarnagar, U.P.
Sampling Location	: IAQ- 001(Reactor 01)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.77
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 29.389252, E 77.702018
Temperature (°C)	: 34
Equipment Used Details	: Fine Particulate Sampler(Envirotech, FLE No-717 & 697),CO Analyzer(Ecotech FLE-149) OVS Sampler
Weather Condition	: Sunny partly cloudy, during monitoring raining was going on 8PM to 6AM



Analysis Report

S. No.	Parameters	Test Results	Indian Factory Act 1948	Test Method
Air Analysis:				
3	Particulate matter (PM _{2.5}), µg/m ³	87.06	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	111.88	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)				
3	Benzene, ppm	9.11	10	FL/SOP/GC-46
4	Toluene, ppm	67.09	100	FL/SOP/GC-46
5	p-Xylene, ppm	88.26	100	FL/SOP/GC-46
6	o-Xylene, ppm	92.38	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND,[DL-0.02]	100	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, mg/m ³	ND,[DL-0.02]	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	6.20	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

Reviewed By

(AUTHORISED SIGNATORY)
 D Matruj, Director

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Issued to: Central Pollution Control Board
 Parivesh Bhawan, East Arjun Nagar,
 Delhi-110032

J.O. No.: ENV20210925-009-021
 ULR Code: TC5503 21 3 00006843 F
 Report Date: 27-09-2021
 Sample receipt Date: 25-09-2021
 Account Manager: Vartika Khandelwal
 Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample
 Date of Sampling
 Time of Sampling
 Test Started On
 Test Completed On
 Purpose of Monitoring
 Method of Sampling
 Company Location

: Work Place Air
 : 23-09-2021 to 24-09-2021
 : 11:40 PM to 11:55 AM
 : 25-09-2021
 : 27-09-2021
 : To Check Pollution Load
 : IS-5182 (P-14) & FL/SOP/ENV/D-04
 : M/S Mahie Green Earth Products, 9KM Store Meerut
 Road Muzaffarnagar, U.P.
 : IAQ- 002 (Reactor 02)
 : 16.76
 : 1
 : N 29.389252, E 77.702018
 : 34
 : Fine Particulate Sampler (Envirotech, FLE
 No-696 & 698), CO Analyzer, OVS Sampler
 : Sunny partly cloudy, during monitoring raining was going
 on 8PM to 6AM



Sampling Location
 Avg. Flow Rate of Air RSPM/SPM (lpm)
 Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)
 Longitude & Latitude
 Temperature (°C)
 Equipment Used Details

Weather Condition

Analysis Report

S. No.	Parameters	Test Results	Indian Factory Act 1948	Test Method
Air Analysis:				
3	Particulate matter (PM _{2.5}), µg/m ³	120.97	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	191.28	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)				
3	Benzene, ppm	12.04	10	FL/SOP/GC-46
4	Toluene, ppm	84.10	100	FL/SOP/GC-46
5	p-Xylene, ppm	116.02	100	FL/SOP/GC-46
6	o-Xylene, ppm	110.66	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND,[DL-0.02]	100	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, mg/m ³	ND,[DL-0.02]	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	6.20	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

Reviewed By

(AUTHORISED SIGNATORY)
 D Mathur, Director

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FARELABS

FOOD ANALYSIS & RESEARCH LABORATORY

TESTING, CALIBRATION, PROFICIENCY TESTING, R&D & TRAINING SERVICES
TEST REPORT



FARE LABS Private Limited

L-17/3, DLF Phase-II, IFFCO Chowk, M.G. Road,
Gurgaon-122002, Haryana, INDIA
Phone : +91-124-4223207, 4034205
Fax : +91-124-4036038, Cell : +91-95992 21227
E-mail : farelabs@farelabs.com
Website : www.farelabs.com

Issued to: Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar,
Delhi-110032

J.O. No.: ENV20210925-009-022
ULR Code: TC5503 21 3 00006844 F
Report Date: 27-09-2021
Sample receipt Date: 25-09-2021
Account Manager: Vartika Khandelwal
Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample	: Work Place Air
Date of Sampling	: 23-09-2021 to 24-09-2021
Time of Sampling	: 11:45 AM to 12:00 PM
Test Started On	: 25-09-2021
Test Completed On	: 27-09-2021
Purpose of Monitoring	: To Check Pollution Load
Method of Sampling	: IS-5182 (P-14) & FL/SOP/ENV/D-04
Company Location	: M/S Mahie Green Earth Products, 9KM Store Meerut Road Muzaffarnagar, U.P.
Sampling Location	: IAQ- 003 (Reactor 03)
Avg. Flow Rate of Air RSPM/SPM (lpm)	: 16.65
Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)	: 1
Longitude & Latitude	: N 29.389252, E 77.702018
Temperature (°C)	: 34
Equipment Used Details	: Fine Particulate Sampler (Envirotech, FLE No-720 & 718), CO Analyzer, OVS Sampler
Weather Condition	: Sunny partly cloudy, during monitoring raining was going on 8PM to 6AM



Analysis Report

S. No.	Parameters	Test Results	Indian Factory Act 1948	Test Method
Air Analysis:				
3	Particulate matter (PM _{2.5}), µg/m ³	62.43	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	133.33	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)				
3	Benzene, ppm	8.25	10	FL/SOP/GC-46
4	Toluene, ppm	88.94	100	FL/SOP/GC-46
5	p-Xylene, ppm	91.12	100	FL/SOP/GC-46
6	o-Xylene, ppm	64.27	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND,[DL-0.02]	100	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, mg/m ³	ND,[DL-0.02]	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	6.13	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
FL/SOP/GC-46 based on IS 5182 (P-11)
FL/SOP/GC-25 based on IS 5182 (P-10)

Reviewed By

Page 1 of 1

(AUTHORISED SIGNATORY)
D Mathur, Director

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FL/T/GEN/F05

TEST REPORT

Issued to: Central Pollution Control Board
 Parivesh Bhawan, East Arjun Nagar,
 Delhi-110032

J.O. No.: ENV20210925-009-023
 ULR Code: TC5503 21 3 00006845 F
 Report Date: 27-09-2021
 Sample receipt Date: 25-09-2021
 Account Manager: Vartika Khandelwal
 Credit Manager: Septesh/Gulab Singh

Sample Particulars:

Nature of the Sample
 Date of Sampling
 Time of Sampling
 Test Started On
 Test Completed On
 Purpose of Monitoring
 Method of Sampling
 Company Location

: Work Place Air
 : 23-09-2021 to 24-09-2021
 : 11:50 AM to 12:05 PM
 : 25-09-2021
 : 27-09-2021
 : To Check Pollution Load
 : IS-5182 (P-14) & FL/SOP/ENV/D-04
 : M/S Mahie Green Earth Products, 9KM Store Meerut
 Road Muzaffarnagar, U.P.
 : IAQ- 004 (Reactor 04)
 : 16.81
 : 1
 : N 29.389252, E 77.702018
 34
 : Fine Particulate Sampler (Envirotech, FLE
 No-138 & 711), CO Analyzer, OVS Sampler
 : Sunny partly cloudy, during monitoring raining was going
 on 8PM to 6AM



Sampling Location

Avg. Flow Rate of Air RSPM/SPM (lpm)
 Avg. Flow Rate of Air RSPM/SPM (lpm) (TVOC)
 Longitude & Latitude
 Temperature (°C)
 Equipment Used Details

Weather Condition

Analysis Report

S. No.	Parameters	Test Results	Indian Factory Act 1948	Test Method
Air Analysis:				
3	Particulate matter (PM _{2.5}), µg/m ³	92	NA	FL/SOP/ENV-19
4	Particulate matter (PM ₁₀), µg/m ³	167.07	NA	FL/SOP/ENV-19
Total Volatile Organic Compounds (TVOC)				
3	Benzene, ppm	8.66	10	FL/SOP/GC-46
4	Toluene, ppm	74.92	100	FL/SOP/GC-46
5	p-Xylene, ppm	58.12	100	FL/SOP/GC-46
6	o-Xylene, ppm	61.14	100	FL/SOP/GC-46
7	m-Xylene, ppm	ND,[DL-0.02]	100	FL/SOP/GC-46
Other Parameters				
8	Benzo (a) Pyrene, mg/m ³	ND,[DL-0.02]	NA	NIOSH Method 5506
9	Carbon Monoxide (as CO), mg/m ³	5.93	40	FL/SOP/GC-25

NOTE: FL/SOP/ENV-19 based on IS 5182 (P-24)
 FL/SOP/GC-46 based on IS 5182 (P-11)
 FL/SOP/GC-25 based on IS 5182 (P-10)

Reviewed By

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TEST REPORT

Issued to: Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar, Delhi-110032
Sampling Loc: M/S Mahie Green Earth Products, 9KM Stone Meerut Road

J.O. No.: FL/PCC/22092021-002
ULR Code: TC5503 21 9 00000334 F
Report Date: 27/09/2021
Sample Receipt Date: 22/09/2021
Account Manager: Vartika Khandelwal
Credit Manager: GULAB/SEPTESH

Sample Particulars:

Nature of the Sample & No. of Samples	: Tyre Pyrolysis Oil (One Sample)
Brand Name	: None
Sample Quantity & Packaging	: 1LitreX2, Tin Bottle
Date of Performance of Test	: 22 nd – 27 th Sep, 2021
Method of Sampling	: FL/SOP/B/D-03
Sample Collected by	: Mr. Jagendra (FARELABS Representative)



Analysis Report

S. No.	Parameter	Test Result	Protocol
1	Sulphur content, mg/Kg*	0.91	IS1448:P-33
2	Water Content, %*	0.19	ISO 12937
3	Total Halogens	286.4	USEPA Method 9076
4	Calorific Value, Kcal/kg*	7003.37	IS-1448: Part 6
5	Sediments, % wt.*	0.0089	IS-1448: Part 30

*Performed at "Unit-2" (D-18, Infocity Phase-II, Sector-33) of FARE Labs

Prepared By
Saman

Checked By:
Saman
Saman Fatima

(AUTHORISED SIGNATORY)
D Mathur
D Mathur, Director

Page 1 of 4

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FL/T/GEN/F05



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Issued to: Central Pollution Control Board

Parivesh Bhawan, East Arjun Nagar, Delhi-110032

Sampling Loc: M/S Mahie Green Earth Products, 9KM Stone Meerut Road

J.O. No.: FL/PCC/22092021-002

ULR Code: TC5503 21 9 00000334 F

Report Date: 27/09/2021

Sample Receipt Date: 22/09/2021

Account Manager: Vartika Khandelwal

Credit Manager: GULAB/SEPTESH

Sample Particulars:

Nature of the Sample & No. of Samples

Brand Name

Sample Quantity & Packaging

Date of Performance of Test

Method of Sampling

Sample Collected by

: Tyre Pyrolysis Oil (One Sample)

: None

: 1LitreX2, Tin Bottle

: 22nd – 27th Sep, 2021

: FL/SOP/B/D-03

: Mr. Jagendra (FARELABS Representative)



TC-5503

Analysis Report

S. No.	Parameter	Test Result	Protocol
1	PAH, % by wt.	0.18	FL/SOP/HPLC-31

Sammaiah
Testing Section

Sammaiah
Prepared By
Dr. Sammaiah

[Signature]
Checked By:
Dr. M. Tripathi, QM

[Signature]
(AUTHORISED SIGNATORY)
Page 2 of 4 D. Mishra, Director

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TEST REPORT

Issued to: Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar, Delhi-110032
Sampling Loc: M/S Mahie Green Earth Products, 9KM Stone Meerut Road

J.O. No.: FL/PCC/22092021-002
ULR Code: TC5503 21 9 00000334 F
Report Date: 27/09/2021
Sample Receipt Date: 22/09/2021
Account Manager: Vartika Khandelwal
Credit Manager: GULAB/SEPTESH

Sample Particulars:

Nature of the Sample & No. of Samples : **Tyre Pyrolysis Oil (One Sample)**
Brand Name : None
Sample Quantity & Packaging : 1LitreX2, Tin Bottle
Date of Performance of Test : 22nd – 27th Sep, 2021
Method of Sampling : FL/SOP/B/D-03
Sample Collected by : Mr. Jagendra (FARELABS Representative)



Analysis Report

S. No.	Parameter	Test Result	Protocol
1	PCB, µg/kg	ND, [LOQ-5]	FL/SOP/GCMS/P-04

TC-5503

ND=Not Detected; LOQ=Limit of Quantification

Mithlesh
Testing Section

Mithlesh
Prepared By
Mithlesh Kumar

M. Tripathi
Checked By:
Dr. M. Tripathi, QM

(AUTHORISED SIGNATORY)
D Mathur
D Mathur, Director

Page 4 of 4

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FL/T-GEN/FQS



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TEST REPORT

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Parivesh Bhawan, East Arjun Nagar, Delhi-110032
Sampling Loc: M/S Mahie Green Earth Products, 9KM Stone Meerut Road

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J.O. No.: FL/PCC/22092021-002
ULR Code: TC5503 21 9 00000334 F
Report Date:
Sample Receipt Date: 22/09/2021
Account Manager: Vartika Khandelwal
Credit Manager: GULAB/SEPTESH

Sample Particulars:

Nature of the Sample & No. of Samples : **Tyre Pyrolysis Oil** (One Sample)
Brand Name : None
Sample Quantity & Packaging : 1 Litre X2, Tin Bottle
Date of Performance of Test : 22nd - 27th Sep, 2021
Method of Sampling : FL/SOP/B/D-03
Sample Collected by : Mr. Jagendra (FARELABS Representative)

Analysis Report

S. No.	Parameter	Test Result	Protocol
1	Density@15°C, kg/l*	0.921	IS1448:P-16
2	Kinematic Viscosity @40°C, *	3.67	IS1448:P-25
3	Flash Point, °C*	30	IS1448:P-21
4	Conradson Carbon Residue (10% residue), % by wt.*	1.62	IS1448:P-8
5	Carbon Number	C ₄ -C ₂₂	FL/SOP/GC-97
6	Acidity on Burning Tip	0.165	ISO 6618
7	Boiling Range	80 to 305	IS-1448:P-18
8	Ash Content	0.005	IS-1448:P-4
9	Pour Point*	>-30	IS 1448:P-10
10	PONA (Paraffin, Olefins, Naphtha, Aromatics)	69.87	FL/SOP/GC-98

*Performed at "Unit-2" (D-18, Infocity Phase-II, Sector-33) of FARE Labs

Prepared By
Saman

Checked By:
Saman Fatima

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(AUTHORISED SIGNATORY)
D Mathur, Director

FL/T/GEN/F-05

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PHOTOGRAPHS TAKEN AT THE TIME OF STUDY





Temperature and pressure Gauge



tyre scrap



condenser



Wet scrubber



Cooling chamber



Primary oil tank



Oil storage tank



Two stacks



Opening of reactor gate for removal of steel wire



Removal of steel wire



Storage of steel wire



Storage of carbon black