

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL AT CHENNAI (SZ)**

**ORIGINAL APPLICATION No. 256 OF 2020 (Suo Motu)**

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Dated this the 9<sup>th</sup> day of November, 2022 at Chennai

Through

A.Yogeshwaran  
Counsel for the Applicant

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL AT CHENNAI (SZ)****ORIGINAL APPLICATION No. 256 OF 2020 (Suo Motu)****Memo filed on behalf of the intervenor****Ennore – Manali is a cluster**

1. The Ennore - Manali Industrial Region ought to be seen as a cluster source of industrial pollution for the purposes of regulation. The industrial region includes industries with their point- and non-point sources of pollution, and associated pollution from movement of heavy vehicles and ancillary facilities for the same.
2. Focusing only on individual industries and on smokestack emissions alone will prove insufficient to bring air quality to healthy levels. The September 2022 report of the Joint Committee in this matter clarifies that expansion proposals are evaluated solely on the basis of consent/EC condition compliance of the proposer industry without attention to the cumulative impact of all activities in the region, or the region's carrying capacity.
3. It is well known that in industrial clusters, even if each individual industry is compliant with norms prescribed for it, the overall pollution within the cluster and its impact zone can exceed health standards. Individual industries need to be regulated as members of a cluster with an eye on the overall ambient environmental quality within the cluster rather than on emissions from the stacks of individual industries.
4. Additionally, other sources of pollution – point and non-point, and industrial, construction, domestic and commercial – also need to be regulated vis-a-vis each other within the region. At present, regulation is restricted to point sources (Stacks) within industries.

**Cumulative Impact Assessment**

5. Cumulative impacts require to be assessed, particularly for areas where Valuable Environmental and Social Components (VECs) (including human and other communities and natural systems that they rely on) are affected by a large number of activities that may appear individually insignificant, but which taken together can have deleterious regional implications. According to the International Finance Corporation, "Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to as "developments") when added to other existing, planned and/or reasonably anticipated future ones."

6. **Cumulative Impact Assessment** *is the process of accounting for cumulative impacts in the context of problem identification and decision-making. It requires consideration and characterization of total exposures to both chemical and non-chemical stressors, as well as the interactions of those stressors, over time across the affected population.*
7. CIAs are valuable because they do the following:
- Compiles a baseline of environmental and social information for the basin/landscape
  - Draws attention to cumulative impacts
  - Documents the extent and magnitude of cumulative impacts
  - Documents locations of cumulative impacts
  - Documents the types of cumulative impacts and receptors
  - Documents stakeholder views of the cumulative impacts
  - Makes recommendations for mitigation and management to reduce the cumulative impacts
8. More information on performing Cumulative Impact Assessments is available from the Good Practice Handbook on the subject published by the International Finance Corporation of the World Bank Group. [https://www.ifc.org/wps/wcm/connect/58fb524c-3f82-462b-918f-0ca1af135334/IFC\\_GoodPracticeHandbook\\_CumulativeImpactAssessment.pdf?MOD=AJPERES&CVID=kbnYgI5](https://www.ifc.org/wps/wcm/connect/58fb524c-3f82-462b-918f-0ca1af135334/IFC_GoodPracticeHandbook_CumulativeImpactAssessment.pdf?MOD=AJPERES&CVID=kbnYgI5)

## **Air Pollution and Health**

9. The current regulatory system is limited to addressing environmental pollution without any understanding of its impacts on human health. It is a fact that pollution will harm human health. Numerous epidemiological studies have found an association between air pollution and a wide range of adverse health effects in the general population; the effects have ranged from subtle subclinical effects to premature death. Air pollution is associated with increased incidences of respiratory symptoms and infections, and even premature mortality. (Jakubiak-Lasocka et al. 2015) The upper respiratory tract (URT) is first affected by air pollution. Children's higher respiratory rates and the fact that their pulmonary capacity is not fully developed makes them more susceptible to air pollutants than adults. [Kurt, 2016] Several studies demonstrate a link between increase in outdoor air pollutants and increased hospitalisation of children complaining of URT infections [Lin, 2012. Amarillo, 2012]. Such infections are important contributors to childhood morbidity and mortality [WHO, 2005]

10. A report dt/15.12.2020 submitted by a Joint Committee to the National Green Tribunal in OA 256 of 2020 found that particulate emissions just from one source – North Chennai Thermal Power Station Stage I – had contributed a pollution load in excess of the carrying capacity of the local airshed for that pollutant.
11. An April 2022 report of a high-level Joint Experts Committee set up by the National Green Tribunal in OA 8 of 2016 found high cancer and non-cancer risk among adults due to exposure to cadmium and lead, and that the risk was far higher among children. The report examined the risk of increased incidence of cancer and non-cancer disease as a result of exposure to toxic metals such as cadmium, chromium, lead and copper. It found that risk of non-cancer disease or hazard index was very high for Ennore area children exposed to lead and cadmium and ranged between 3.36 and 5.01 respectively, as compared to a HI of 1 for a healthy population. Cancer risk for Ennore area children exposed to lead, chromium and cadmium was very high and ranged between 1.06 in 10,000 for lead, 1.26 in a 1000 for chromium and nearly 4 in a 1000 for cadmium. That is more than a 1000 times higher risk than levels of concern for exposure to cadmium and chromium. Cancer risk greater than 1 in a million is internationally accepted norm for deciding level of concern. The authors of this report mention that pervasive health problems was a common complaint by local residents that spoke at a public consultation convened by the expert committee.
12. The high levels of pollution prevalent in the region and indicative studies on health from this region suggest that impacts on health of local residents and workers that spend substantial periods of time within the region are already occurring. Local residents have also repeatedly highlighted the lack of adequate health facilities in the region capable of addressing pollution-induced health ailments.
13. Decisions for renewal of licenses for existing industries or for permitting expansion or setting up of new industries are admittedly taken without any health basis. This is despite the fact that agencies like World Health Organisation have declared as early as in 2003 that health impacts should be integral to any strategic environmental impact assessment.
14. Below is an excerpt from WHO's "Health Impact Assessment Toolkit for Cities: Document 1" which elaborates on the international policy that underscores the importance of factoring health considerations in environmental decision-making. A copy of the toolkit can be produced if required.

(Source: [https://www.euro.who.int/ data/assets/pdf file/0007/101500/HIA Toolkit 1.pdf](https://www.euro.who.int/data/assets/pdf_file/0007/101500/HIA_Toolkit_1.pdf) )

*"At the WHO Third Ministerial Conference on Environment and Health held in London in 1999, several countries supported the idea of a protocol on strategic environment and HIA. WHO, in close collaboration with the United Nations Economic Commission for Europe, was then involved in a process that resulted a strong health dimension in the Strategic Environmental Assessment Protocol (10). The Strategic Environmental Assessment Protocol is set within the framework of the 1991 Espoo Convention on Environmental Impact Assessment in a Transboundary Context. The new Protocol ensures that health considerations are taken into account by requiring parties to assess both the environmental and health effects of proposals. The Protocol, which was adopted at the 5th Ministerial Conference "Environment for Europe" in Kiev, Ukraine on 21–23 May 2003, has been adopted by 36 countries. The word strategic is used to describe this type of environmental assessment because strategic environmental assessment is undertaken much earlier in the decision-making process of proposals (unlike environmental impact assessment), allowing more time for environmental and health issues to be considered. Strategic environmental assessment especially emphasizes the consideration of human health, opening up the possibility for health to be thoroughly considered within environmental assessment, unlike the current situation in environmental impact assessment (Table 2) (11)."*

### **Air Quality Monitoring**

15. If ambient air quality is to be the basis for working back to the regulatory controls required to curb pollution, the network of ambient air quality monitors needs to be vastly enhanced. Also, air quality is not affected merely by PM, SO<sub>2</sub> and NO<sub>x</sub>. Petroleum, petrochemical and pharmaceutical industries are substantial sources of other toxic gases, including Volatile Organic Compounds like Benzene, Toluene, Xylene, ethylene oxide etc, and sulphur gases, including mercaptans, hydrogen sulphide etc. On a case to case basis, and pursuant to detailed audits of individual industries, stack, in-factory ambient and outside the fence line ambient monitoring protocols need to be strengthened to include other relevant chemical parameters.

### **Regulatory Blind Spots**

16. Additionally, particular attention needs to be paid to regulatory blind spots that are sources of substantial pollution. Three such sources are: 1) Fugitive emissions from within industries; 2) Vehicular emissions and resuspended road dust; 3) Emissions from flare towers in the refinery and petrochemical facilities. Tamil Nadu Pollution Control Board admits that there are no specific rules regulating flare emissions.

***Vehicular Emissions and Road Dust***

17. The poor conditions of the roads and the busy traffic of heavy vehicles between the ports and local industries and beyond has made roads/vehicles a significant source of air pollution. The joint committee report also addresses this issue. This is a serious source of pollution for the communities living along these roads. (Please see photographs attached)

***Flaring***

18. Flaring is both a source of air emissions and has the potential to burn valuable products. Therefore, for environmental and energy efficiency reasons, its use must be limited and the amount of flared gas reduced as much as possible. It is generally restricted to unplanned shutdowns or emergency cases, and not for routine purposes. A detailed discussion of flare regulation in various jurisdictions around the world is in Annexure 1. Links where these regulations are available have also been provided.

***Enforcement Lapses***

19. The September 2022 report of Joint Committee provides evidence of the enforcement lapses of the regulator. Rules and monitoring data are only as useful as the enforcement by the regulator is good, prompt and stringent. The Central Pollution Control Board has set out an elaborate protocol for Online Continuous Emissions Monitoring Systems. However, these guidelines need to be revised or modified for application in industrial clusters like Ennore – Manali – where sustained exceedance of emission parameters even for 2 hours will have a cascading effect.

***Gross Violations Ignored***

20. The Joint Committee's report highlights that even in instances of gross violation, such as when an industry fails to monitor what is required to be monitored under law, the regulator is a mute spectator. For instance, the report mentions that:

- Kothari Industrial Corporation Ltd's fertiliser factory in Ennore village is required to monitor Hydrogen Fluoride and PM. However, it only monitors HF and not PM.
- Madras Fluorine is required to monitor HF. But it has failed to provide a monitor.

21. It is submitted that the TNPCB and CPCB have to prescribe monitoring of all expected emissions from a given stack. It cannot ignore monitoring of VOCs and other emissions depending on the nature of industries. While it is important to monitor PM levels, it not the only parameter to be monitored, especially in an industrial cluster with petrochemical, chemical industries etc.

## ***Pollution Alerts***

22. The Joint Committee's report also talks about conditions of exceedances that trigger a "yellow alert." However, the report is silent on how industries are regulated with respect to other more gross exceedances and non-compliance, namely "orange, red and purple alerts."
23. Further, even with respect to exceedances/non-compliance that leads to "yellow alert" notice to be sent to the offending industry, no action – neither punitive nor corrective -- appears to have been taken under law by the regulator.
24. Consider the case of Unit 1, NCTPS Stage I's PM figures from the year 2019. Emissions from Unit 1's stack were such that they would have triggered 603 separate yellow alerts on 141 days of the year. Alerts are meant as a warning against punitive action. The issuance of yellow alerts has been reduced to a meaningless ritual.

## **PRAYERS**

In these circumstances, apart from implementation of Joint committee recommendations especially with regard to shift to cleaner fuels, within a timeframe fixed by this Hon'ble tribunal, it is prayed that this Hon'ble Tribunal may consider the following directions as well:

### **I. *Commission relevant baseline studies to inform regulatory actions***

- ***Process Audit/Mass Balance Studies:*** TNPCB to directly engage 3<sup>rd</sup> party consultant to carry out detailed mass balances for key chemical inputs, including toxic solvents, and process audits within each industry to identify point/non-point sources and static and mobile sources of emissions within each industry; installed equipment and audit practices for periodic maintenance and upgradation of emissions control; and make recommendations based on Best Practices and BAT. (Mass balance for petroleum refineries, for instance, should present sulphur apportionment to different product and waste streams using empirical data.)
- ***Performance Audit:*** Commission a performance audit of the pollution detection and control systems, including Leak Detection and Repair (LDAR) systems in place for addressing fugitive emissions. Companies like Chennai Petroleum Corporation Ltd claim to have LDAR systems. However, despite the same, fenceline communities report various odour pollution incidents.
- ***Health Impact Assessment :*** Commission a Health Impact Assessment covering the impact zone of the Ennore-Manali Industrial Region. It should cover an area of 10 km from the edges of the industrial zone. A centre point

should not be taken for determination of study area, since this would exclude the areas around the industrial zone which are impacted.

- Commission a **Cumulative Impact Assessment** covering the impact zone of the Ennore-Manali Industrial region. It should cover an area of 10 km from the edges of the industrial zone. Cumulative impact assessment should include all RED category industries in the air shed, take into account all sources of pollution including stack, fugitive emissions, transport and other sources. It should be based on at least yearlong monitoring of parameters.

## **II. Enhancing Monitoring, Transparency and Enforcement**

- TNPCB should increase the network of Continuous Ambient Air Quality Monitoring stations, including by installing monitors in strategic locations such as schools and residential areas within the Critically Polluted Area.
- Based on the findings of the Audits, direct industries to install in-factory ambient monitors to detect and report additional industry-specific monitors – such as mercaptans, hydrogen sulphide and sulphur compounds for refineries and pharmaceutical industries, VOCs for refineries and petrochemical industries.
- Direct TNPCB to fully implement the CPCB's revised guidelines with respect to "Installation of Continuous Ambient Air Quality Monitoring Stations," including by making the realtime and historical AAQ data available to public for analyses and oversight.
- Direct TNPCB to upload 15-min ambient air quality/emissions data downloadable in XL format and searchable by date/period and industry, stack and/or sampling location.
- Direct TNPCB to publish weekly report for each industry based on 15 minute averages, compiling and reporting exceedances, static/zero readings, notified shutdown/maintenance and actions taken.
- Direct TNPCB to submit report on stack-specific parameters, in addition to those already prescribed, that are sought to be monitored by industry and thresholds for same.
- Constitute an LAEC consisting of representative of local residents, prominent trade union representative, an eminent health expert and environmental expert. The LAEC may be tasked with carrying out quarterly monitoring and overseeing audits and health studies.
- Direct TNPCB to strictly comply with CPCB guidelines on use of OCEMS data to regulate industries by issuing alerts and to take immediate corrective action to prevent continued exceedance of emission parameters. The aim should be to prevent pollution – imposition of penalty does not aid in any manner to prevent pollution from being caused.
- TNPCB to revise and strengthen criteria for issuance of yellow, orange, red and purple alerts for exceedance of stack emissions considering the clustered nature of RED category large polluting industries in the Ennore – manali region.

- Direct TNPCB to submit and publish online detailed periodic industry-wise report highlighting yellow, orange, red and purple alerts, and action taken.

### **III. Flare Avoidance, Monitoring and Regulation**

- Direct TNPCB in consultation with CPCB to develop a coherent flare regulation in a time-bound manner drawing from best practices worldwide

### **IV. Corporate Social Responsibility and Local Health Infrastructure:**

- Direct Greater Chennai Corporation and TNPCB to ensure that Corporate Social Responsibility and Environmental Funds of industries are spent only in local area and for the purposes of improving health and environment conditions, including by upgrading local health facilities.

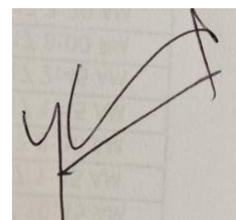
### **V. Road Dust and Vehicular Pollution**

- Direct TNPCB to work with GCC and Traffic Police to draw up and implement a "road, roadside upgradation plan, PUC enforcement plan for heavy vehicles entering North Chennai."
- Roads in these areas should be relaid and maintained in good condition. Relaying of roads in Ennore – Manali area should be completed by the Corporation of Chennai within a timeframe fixed by this Hon'ble Tribunal.

### **VI. TNPCB Office in Ennore-Manali Area**

- Direct TNPCB to establish an office inside the industrial area to enable swift action and allow residents easier access.

Dated this the 9<sup>th</sup> day of November, 2022 at Chennai



Counsel for the Intervenor

## Annexure 1

### Note on Regulation of Flares in Various Jurisdictions

#### European Union

The European Union has the Industrial Emissions Directive (IED) which regulates many activities <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075&from=EN>

This Directive, known earlier, as the Integrated Prevention and Pollution Control, establishes the obligation to obtain a permit for undertaking those activities. The permits must contain among its conditions the emissions limit values that must be based on Best Available Techniques-BAT (Articles 10 to 15) BAT are established in documents known as BATs Reference Documents. The BAT for flares in the refining of oil and gas

[https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/REF\\_BREF\\_2015.pdf](https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/REF_BREF_2015.pdf)

Excerpt from Best Available Techniques (BAT) Reference Document for the Refining of Mineral Oil and Gas, at page 625.

#### 5.18 BAT conclusions for flares

**BAT 55.** In order to prevent emissions to air from flares, BAT is to use flaring only for safety reasons or for non-routine operational conditions (e.g. start-ups, shutdown).

**BAT 56.** In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use the techniques given below.

Technique	Description	Applicability
i. Correct plant design	See Section 5.20.7	Applicable to new units. Flare gas recovery system may be retrofitted in existing units
ii. Plant management	See Section 5.20.7	Generally applicable
iii. Correct flaring devices design	See Section 5.20.7	Applicable to new units
iv. Monitoring and reporting	See Section 5.20.7	Generally applicable

#### Canada Oil and Gas Drilling and Production Regulations

Below is an excerpt from the Canada Oil and Gas Drilling and Production Regulations (SOR/2009-315)

<https://laws-lois.justice.gc.ca/eng/regulations/SOR-2009-315/page-4.html#docCont>

#### United States of America

The U.S. EPA has developed regulations for flares pursuant to the promulgation of the US Clean Air Act.

40 CFR Part 63, Subpart CC National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries, § 63.670 Requirements for flare control devices.

<https://www.law.cornell.edu/cfr/text/40/63.670>

40 CFR § 63.670 contains requirements for flare control devices.

<https://www.law.cornell.edu/cfr/text/40/63.670>

40 CFR § 63.671 contains requirements for flare monitoring systems.

<https://www.law.cornell.edu/cfr/text/40/63.671>

The key provisions of the USEPA rules are as follows:

Operators of refineries must ensure that a pilot flame is present in each flare at all times to prevent the bypass of gases (regulated material) that are routed to the flare. 40 CFR § 63.670(b) states:

“(b) Pilot flame presence. The owner or operator shall operate each flare with a pilot flame present at all times when regulated material is routed to the flare. Each 15-minute block during which there is at least one minute where no pilot flame is present when regulated material is routed to the flare is a deviation of the standard.”

Except for brief periods of time, operators of refineries **may not allow flares to emit visible amounts of smoke**. 40 CFR § 63.670(c) states:

“(c) Visible emissions. The owner or operator shall specify the smokeless design capacity of each flare and operate with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours, when regulated material is routed to the flare and the flare vent gas flow rate is less than the smokeless design capacity of the flare. The owner or operator shall monitor for visible emissions from the flare as specified in paragraph (h) of this section.”

In order to prevent the formation of smoke from flares, operators of refineries may not allow the velocity of flow at the tip of the flare to exceed specified limits. 40 CFR § 63.670(d) states:

“(d) Flare tip velocity. For each flare, the owner or operator shall comply with either paragraph (d)(1) or (2) of this section, provided the appropriate

monitoring systems are in-place, whenever regulated material is routed to the flare for at least 15-minutes and the flare vent gas flow rate is less than the smokeless design capacity of the flare.”

Also in order to prevent the formation of smoke from flares, operators of refineries must ensure that any regulated material has a minimum heating value to facilitate complete combustion. 40 CFR § 63.670(d) states:

“(e) Combustion zone operating limits. For each flare, the owner or operator shall operate the flare to maintain the net heating value of flare combustion zone gas (NHVcz) at or above 270 British thermal units per standard cubic feet (Btu/scf) determined on a 15-minute block period basis when regulated material is routed to the flare for at least 15-minutes.”

Perhaps the most important provision of the regulation requires the operators of refineries to develop **a flare management plan to minimize flaring** during periods of startup, shutdown, or emergency releases for each flare that has the potential to operate above its smokeless capacity (which is practically every flare. 40 CFR § 63.670(o)(1) states:

“(o) Emergency flaring provisions. The owner or operator of a flare that has the potential to operate above its smokeless capacity under any circumstance shall comply with the provisions in paragraphs (o)(1) through (7) of this section.

“(1) Develop a flare management plan to minimize flaring during periods of startup, shutdown, or emergency releases. The flare management plan must include the information described in paragraphs (o)(1)(i) through (vii) of this section.

(i) A listing of all refinery process units, ancillary equipment, and fuel gas systems connected to the flare for each affected flare.

(ii) An assessment of whether discharges to affected flares from these process units, ancillary equipment and fuel gas systems can be minimized or prevented during periods of startup, shutdown, or emergency releases. The *flare minimization assessment* must (at a minimum) consider the items in paragraphs (o)(1)(ii)(A) through (C) of this section. The assessment must provide clear rationale in terms of costs (capital and annual operating), natural gas offset credits (if

applicable), technical feasibility, secondary environmental impacts and safety considerations for the selected minimization alternative(s) or a statement, with justifications, that flow reduction could not be achieved. Based upon the assessment, each owner or operator of an affected flare shall identify the minimization alternatives that it has implemented by the due date of the flare management plan and shall include a schedule for the prompt implementation of any selected measures that cannot reasonably be completed as of that date. ....

“(iii) A description of each affected flare containing the information in paragraphs (o)(1)(iii)(A) through (G) of this section. (A) A general description of the flare, including whether it is a ground flare or elevated (including height), the type of assist system (e.g., air, steam, pressure, non-assisted), whether the flare is used on a routine basis or if it is only used during periods of startup, shutdown or emergency release, and whether the flare is equipped with a flare gas recovery system. (B) The smokeless capacity of the flare based on a 15-minute block average and design conditions. Note: A single value must be provided for the smokeless capacity of the flare. (C) The maximum vent gas flow rate (hydraulic load capacity). ... (G) Simple process flow diagram showing the locations of the flare following components of the flare: Flare tip (date installed, manufacturer, nominal and effective tip diameter, tip drawing); knockout or surge drum(s) or pot(s) (including dimensions and design capacities); flare header(s) and subheader(s); assist system; and ignition system.

“(iv) Description and simple process flow diagram showing all gas lines (including flare waste gas, purge or sweep gas (as applicable), supplemental gas) that are associated with the flare. For purge, sweep, supplemental gas, identify the type of gas used. Designate which lines are exempt from composition or net heating value monitoring and why (e.g., natural gas, gas streams that have been demonstrated to have consistent composition, pilot gas). Designate which lines are monitored and identify on the process flow diagram the location and type of each monitor. Designate the pressure relief devices that are vented to the flare.

“(v) For each flow rate, gas composition, net heating value or hydrogen concentration monitor identified in paragraph (o)(1)(iv) of

this section, provide a detailed description of the manufacturer's specifications, including, but not limited to, make, model, type, range, precision, accuracy, calibration, maintenance and quality assurance procedures.

“(vi) For each pressure relief device vented to the flare identified in paragraph (o)(1)(iv) of this section, provide a detailed description of each pressure release device, including type of relief device (rupture disc, valve type) diameter of the relief device opening, set pressure of the relief device and listing of the prevention measures implemented. This information may be maintained in an electronic database on-site and does not need to be submitted as part of the flare management plan unless requested to do so by the Administrator.

“(vii) *Procedures to minimize or eliminate discharges to the flare during the planned startup and shutdown of the refinery process units and ancillary equipment that are connected to the affected flare, together with a schedule for the prompt implementation of any procedures that cannot reasonably be implemented as of the date of the submission of the flare management plan.*”

Finally, and also importantly, the rule requires operators of refineries **to conduct, within 45 days, a root cause analysis and corrective action analysis** anytime visible emissions are present at a flare or if the vent gas flow rate exceeds the smokeless capacity of the flare. An operator of a refinery **violates emergency flaring work practice standard by allowing more than three visible emissions events, or three flow rate exceedances, at a single flare during any three-year calendar period.** 40 CFR § 63.670(o)(3)(4)(5) and (7) state:

(3) The owner or operator of a flare subject to this subpart shall conduct a root cause analysis and a corrective action analysis for each flow event that contains regulated material and that meets either the criteria in paragraph (o)(3)(i) or (ii) of this section.

(i) The vent gas flow rate exceeds the smokeless capacity of the flare based on a 15-minute block average and visible emissions are present from the flare for more than 5 minutes during any 2 consecutive hours during the release event.

(ii) The vent gas flow rate exceeds the smokeless capacity of the flare and the 15-minute block average flare tip velocity exceeds the maximum flare tip velocity determined using the methods in paragraph (d)(2) of this section.

(4) A root cause analysis and corrective action analysis must be completed as soon as possible, but no later than 45 days after a flare flow event meeting the criteria in paragraph (o)(3)(i) or (ii) of this section. ....

(5) Each owner or operator of a flare required to conduct a root cause analysis and corrective action analysis as specified in paragraphs (o)(3) and (4) of this section shall implement the corrective action(s) identified in the corrective action analysis in accordance with the applicable requirements in paragraphs (o)(5)(i) through (iii) of this section.

(i) All corrective action(s) must be implemented within 45 days of the event for which the root cause and corrective action analyses were required or as soon thereafter as practicable. ....

(7) The following events would be a violation of this emergency flaring work practice standard.

(iv) Three visible emissions exceedance events meeting the criteria in paragraph (o)(3)(i) of this section that were not caused by a force majeure event from a single flare in a 3 calendar year period for any reason.

(v) Three flare tip velocity exceedance events meeting the criteria in paragraph (o)(3)(ii) of this section that were not caused by a force majeure event from a single flare in a 3 calendar year period for any reason.

## Photographs

November 2021 - Road dust in Thiruvottiyur Expressway road



Large deposition of sand dust on the Thiruvottiyur Expressway road affecting the commuter and Thiruvottiyur residents

November 2021 - Road dust in Thiruvottiyur Expressway road



Large deposition of sand dust on the Thiruvottiyur Expressway road affecting the commuter and Thiruvottiyur residents







4 November, 2022 - Thiruvottiyur Express Way, Thiruvottiyur

Potholes in the Thiruvottiyur Expressway where a large number of trucks travel 'from and to' the Chennai Port Ltd.



4 November, 2022 - Athipattu-NCTPS main road



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Ash dust, Coal dust, soil dust and chemicals deposited by truck carrying load 'to and from' NCTPS, Kamarajar Port Ltd, L&T port and other major cement, fertilizer and Thermal Power plants in Ennore, Kattupalli and surrounding area



November 2022 - Athipattu NCTPS Main road Potholes