

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI
ORIGINAL APPLICATION NO. 327 OF 2023

IN THE MATTER OF:

In re: News item published in India Today dated 30.04.2023 titled "3 minors among 11 dead in Ludhiana gas leak, Punjab govt announces Rs 2 lakh ex-gratia"

S. No.	Particulars	Page No.
1.	Report of Joint Committee in compliance of Hon'ble NGT Order dated 13.10.2023 in OA No. 327 OF 2023, In re: News item published in India Today dated 30.04.2023 titled "3 minors among 11 dead in Ludhiana gas leak, Punjab govt announces Rs 2 lakh ex-gratia".	
2.	Annexure-I: Copy of MCL letter dated 29.12.2023 and PWSSB dated 22.12.2023 letter.	
3.	Annexure-II: List of Twenty-two (22) electroplating / pickling /surface finishing industries etc. located in 500 meters radius from affected site / location.	
4.	Annexure-III: Details of lifting of effluent from the industries situated in adjoining of Sua Road, Giaspura as per data received from Common Effluent Treatment Plant (CETP) Operator and authorized re-processors during 01.04.2022 to 30.4.2023.	
5.	Annexure-IV: Photograph of the manhole on the day of incident i., 30-04-2023.	
6.	Annexure-V: The elevation drawings of the houdis and their connection to main sewer with manholes.	


(Vishal Gandhi)
 Scientist E
 Central Pollution Control Board
 Delhi-110032

Dated: 04.03.2024
 Place: Delhi

1.0 BACKGROUND

The Hon'ble NGT has taken Suo Moto cognizance in the case of News Item published in India Today dated 30.04.2023 titled "3 minors among 11 dead in Ludhiana gas leak, Punjab Govt. announces Rs. 2 Lakh ex-gratia". The case was registered as Original Application No. 327 of 2023.

Hon'ble NGT vide order dated 02.05.2023 had constituted Eight Member Fact – Finding Joint Committee to be headed by Chairman, Punjab SPCB and had directed that the Committee will submit the report. There was a further direction to the District Magistrate, Ludhiana to ensure payment of compensation to heirs of 11 deceased persons.

The report on behalf of the aforesaid Committee has been filed admitting the gas leak incident on 30.04.2023 resulting in death of 11 persons which include the minors also. In the report, the reason for the alleged gas leak is stated to be the escape of gases from the sewer line. The reason so disclosed in the report does not appear to be convincing and thereby Hon'ble NGT further directed vide order dated 13.10.2023 as follows:

Para 4: Having regard to the aforesaid, we are of the opinion that a fresh report by an independent Committee is required to be obtained as the issue is very serious wherein an incident of gas leak has caused death of as many as 11 persons. The possibility of repeat of such an incident cannot be ruled out, therefore, it is important to ascertain the real cause of gas leak and to fix the responsibility.

Para 5. Hence, we constitute a Committee comprising of the Joint Secretary, MoEF&CC, Member Secretary, CPCB and one Professor to be nominated by the Director, IIT Delhi having expertise in the field. The Member Secretary, CPCB will act as nodal agency for coordination and compliance. The Committee will visit the site, ascertain the cause of gas leak and also the persons responsible for the same and submit a comprehensive report in this regard to the Tribunal on or before the next date of hearing.

2.0 APPROACH AND METHODOLOGY OF THE COMMITTEE

In compliance to the directions of Hon'ble NGT, following actions were taken:

1. CPCB vide letter dated 17-11-2023 requested IIT Delhi and MoEF & CC to nominate their representative for participation in joint committee constituted by Hon'ble NGT.
2. IIT Delhi vide email dated 23-11-2023 and MoEF&CC vide letter dated 29-11-2023 nominated following officials for their participation in joint committee:
 - a. Prof. Sreedevi Upadhyayula, Department of Chemical Engineering, IIT Delhi.
 - b. Sh. Raja Ram Singh, DIGF, MoEF&CC, Chandigarh.
3. CPCB has convened first meeting of the Committee on 11.12.2023 along with officials of Punjab SPCB and Municipal Corporation Ludhiana (MCL), Punjab to discuss about the incident of the gas leak. During the meeting, desired information was sought and it was decided that required field visit shall be performed immediately after receiving following information:
 - a. Post mortem reports of the deceased.
 - b. Comprehensive reports of the earlier Committee as well as expert agencies engaged by Punjab Pollution Control Board (PPCB) and District administration, Ludhiana and MCL.
 - c. Complete Engineering Drawing & Design details of sewer network. Also, complete sewer network clearly showing the connectivity with Giaspura sewer line.
 - d. Records of the permitted connection and other connections (illegal connection) in the sewerage network.
 - e. Gas analysis report measured by National Disaster Response Force (NDRF), PPCB and other agencies, if any, in sewer manhole.
 - f. List of all industries located along the sewer network along with address, type of process, categories of units, status of CTO and authorization under Hazardous and Other Waste (Management & Transboundary Movement) Rules, 2016 (HOWM rules), mode of disposal of effluent through CETP or individual, Date of last inspection conducted by PPCB and status of compliance.
4. The Committee visited the site during December 15-16, 2023 and also held interaction with officials of concerned departments - Punjab SPCB; Municipal

Corporation Ludhiana (MCL), Punjab; District Administration, Punjab PCB; NDRF, and; Punjab Water Supply Sewerage Board (PWSSB).

5. Based on gathered information and interaction, the Committee performed the following:
 - a. Field visit of Giaspura, Ludhiana and the affected area.
 - b. Identification of hotspots
 - c. Sampling of various sewer manholes preferably in common locations of earlier sampling to know variations. The sampling points were also considered taking into the account the impact of branched sewer in upstream of Gas leak site. Sampling of manholes of main sewer in upstream and downstream were also considered.
 - d. Record Statement of people
 - e. Viewing video clipping, if available
 - f. Obtaining views of local residents of Giaspura Ludhiana

6. Sampling was carried-out from 05 number of manholes on main sewer and 06 number of manholes on branch sewer. Effluent samples were also collected from industrial units namely M/S R.P Enterprises and STP located at Balloke. Samples were analyzed for pH, COD, BOD, Chlorides, Sulphate, Ammonia and Heavy Metals at Laboratory of CPCB. The sampling locations are presented in schematic diagram in **Figure 1**. List of monitoring locations are summarized as:
 - a. Manholes of MAIN SEWER
 - i. Point A – In Front of Jasbir Building Store.
 - ii. Point B – Near Transformer, Outside Saroj Beauty Parlour.
 - iii. Point C – In Front of M/s NITCO Logistic (P) Ltd.
 - iv. Point D –In Front of Goyal Store
 - v. Point E – In Front of Dharm Kanda, Punjab Emporium.
 - b. Manholes of BRANCH SEWER
 - i. Point T1 - Industrial Area C, Sua Road Front of Techno Mobile Centre.
 - ii. Point T2 - Branch Sewer Manhole front of Kirti Tea Stall.
 - iii. Point T3 - Adjacent M/s Godavari Traders.
 - iv. Point T4 – In Front of S.K. Auto Centre.
 - v. Point T5 – In Front of Deepak Karayana Store.

- vi. Point T6 - Manhole front of Aashirwad Computerized Weigh bridge.

The industrial units located in catchment of Giaspura, Ludhiana was obtained from PPCB for their random inspection and monitoring. List of reported 22 units is given below.

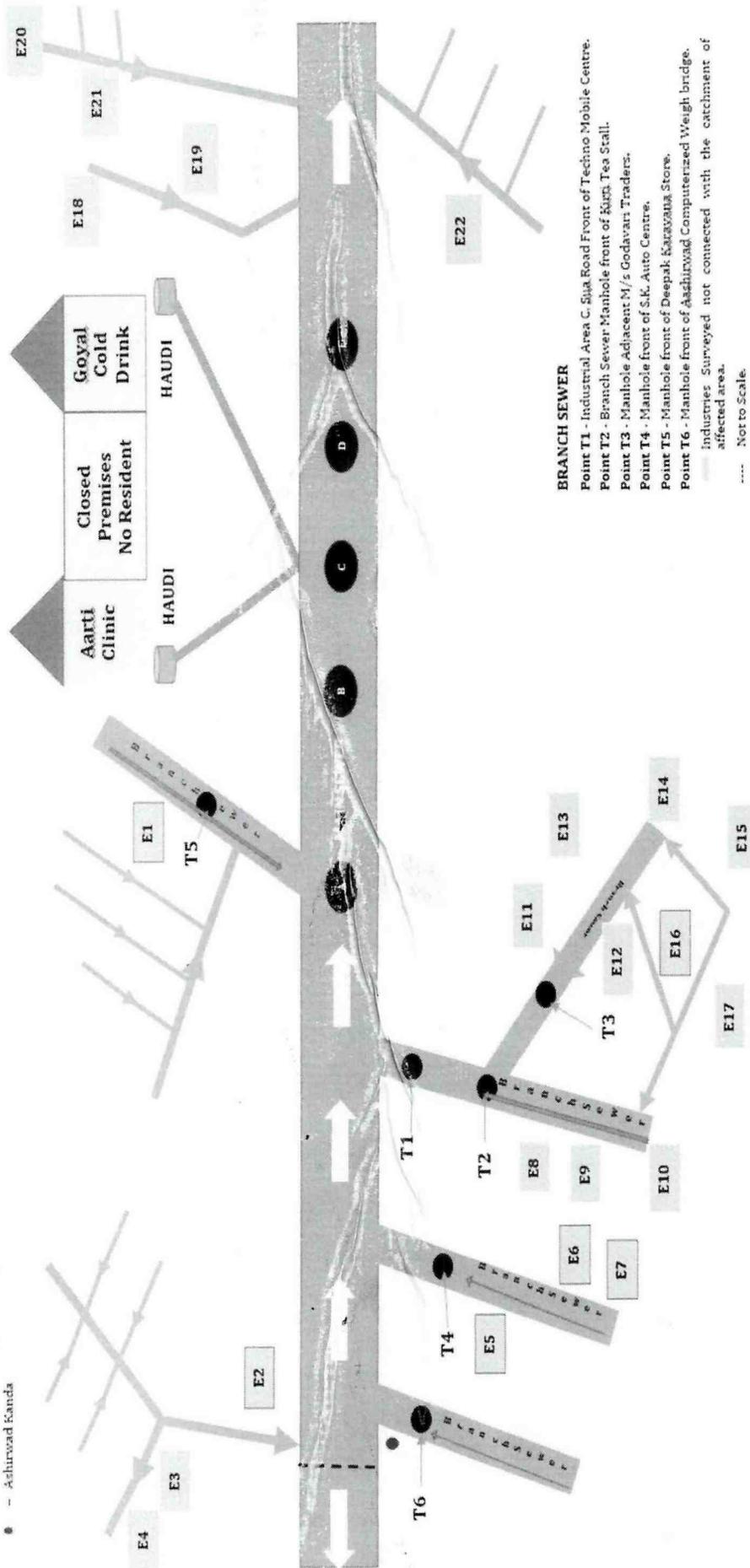
Code	Name and address of the industry
E1	M/s RP Enterprises, Makkar Colony, Dhandari Kalan, Sua Road, Ludhiana
E2	M/s Sidana Wires, Giaspura Sua Road, Ludhiana
E3	M/s Bansal Manufacturing Company, 536/35/1/4, Giaspura, Sua Road, Ludhiana
E4	M/s Trimurti Exports, Industrial Area-C, Giaspura, Ludhiana
E5	M/s Maharaja International (Unit-II), BXX1X-536/26/38, Sua Road, Ludhiana
E6	M/s Maharaja International (Unit-I), BXX1X-536/26/3, Sua Road, Ludhiana
E7	M/s Maharaja International (Unit-III), BXX1X-536/26/35, Sua Road, Ludhiana
E8	M/s Pullman Sales Corporation, Nr. Nanaksar Kanda, Sua Road, Giaspura, Ludhiana
E9	M/s Indian Bicycles, 536/25B/1, Industrial Area-C, Sua Road, Ludhiana
E10	M/s Guru Nanak Enterprises, Plot no. 66/12, Industrial Area-C, Giaspura, Ludhiana
E11	M/s DKT Industrial Company, Giaspura, DhandariKalan, Sua Road, Ludhiana
E12	M/s Anmol Enterprises, Giaspura, Sua Road, Ludhiana
E13	M/s Malwa Auto Enterprises, Nr. NanaksarDharam Kanda, DhandariKalan, Sua Road, Ludhiana
E14	M/s Shivam Auto Industries, Nr. NanaksarDharam Kanda, Dhandari Kalan, Sua Road, Ludhiana

Code	Name and address of the industry
E15	Shri Krishna steel Industries, B-29, 536/25/1-4 Sua road ind. Area-C Giaspura, Ludhiana
E16	King Industry, PLOT.NO.B-29/536/25/3A/2,SUA ROAD, IND-AREA-C, LUDHIANA
E17	Davinder Cycle Industries, B-xxix,536/25/3, Hadbast No-241, Dhandari Kalan, Indl.area-c,sua Road, Ludhiana
E18	M/s A.T. Wires, B/s Sitara Cinema, Sua Road, Ludhiana
E19	M/s JMD Happy Ispat, B/s Sitara Cinema, Sua Road, Ludhiana
E20	M/s Munna Zinc Plating, St. no. 4, Guru Amardass Colony, Sua Road, Ludhiana
E21	M/s Pal Industries, Sua Road, Ludhiana
E22	M/s Aggarwal Wire & Steel Products, Shanti Nagar, Sua Road, Ludhiana
Note: - <ul style="list-style-type: none"> • Industries located upstream of the point of incident and upto Aashirwad Kanda: - E1, E2, E6, E7, E8, E9, E10, E11, E12, E13, E14, E16, E17 • Industries either located downstream or upstream (beyond Aashirwad Kanda) of the point of incident:- E3, E4, E18, E19, E20, E21, E22 	

SCHEMATIC DIAGRAM OF GIASPURA GAS LEAK

MAIN SEWER

- Point A - From Manhole front of Jasbir Building Store.
- Point B - From Manhole near Transformer: Outside Sapori Beauty Parlour.
- Point C - Front of M/s NITCO Logistic (P) Ltd.
- Point D - From Manhole front of Goyal Cold Drink.
- Point E - Front of Dhanraj Kanda Punjab Emporium.
- - Ashirwad Kanda



BRANCH SEWER

- Point T1 - Industrial Area C, Sija Road Front of Techno Mobile Centre.
- Point T2 - Branch Sewer Manhole front of Kirri Tea Stall.
- Point T3 - Manhole Adjacent M/s Godawan Traders.
- Point T4 - Manhole front of S.K. Auto Centre.
- Point T5 - Manhole front of Deepak Karayana Store.
- Point T6 - Manhole front of Ashirwad Computerized Weigh bridge.
- industries surveyed not connected with the catchment of affected area.
- Not to Scale.

Figure 1: Schematic Diagram of Main Sewer and branched Sewer along with Sampling Points

3.0 ABOUT THE INCIDENT

An alleged gas leak incident was reported in Sua Road, Giaspura in eastern part of Ludhiana on 30-04-2023 at 07:30 AM which caused the death of 11 people as reported in News item. It was reported that residents of a house around 30-40 yards away from a sewerage manhole has collapsed.

The affected area was evacuated and cordoned off by local authorities. NDRF team identified the areas of the leakage, and with help of hand-held gas detection kits, detected higher levels of Hydrogen Sulfide in the monitored area.

4.0 INVESTIGATION CARRIED OUT EARLIER AFTER THE INCIDENT

➤ BY FACT – FINDING JOINT COMMITTEE (FFJC)

Hon'ble NGT vide order dated 02.05.2023 constituted an Eight Member Fact – Finding Joint Committee (FFJC) headed by Chairman, Punjab State PCB; Regional Director, CPCB Chandigarh; Industrial Toxicology Research Centre (ITRC), Lucknow; nominee of Director, PGI Chandigarh; nominee of NDRF; State PCB; District Magistrate, Ludhiana, and; Commissioner, Municipal Corporation, Ludhiana.

The said FFJC after required investigation and considering views of experts; Dr. Anoop Verma, Professor, Thapar Institute of Engineering & Technology (TIET), Patiala; Expert Committee engaged by Punjab PCB in consultation with District Administration comprising of Prof. Sushil Mittal, Vice Chancellor, Sardar Beant Singh State University, Gurdaspur & Prof. Raj Kumar Gupta, TIET, Patiala; Regional Director, CPCB, Chandigarh; CSIR- Indian Toxicology Research Centre (ITRC) and Post Graduate Institute of Medical Education and Research; submitted it report before the Hon'ble NGT.

Observations of the Report of Fact – Finding Joint Committee and other reports / information (Post-Mortem report, Drainage pattern, Analysis results of NDRF and Punjab PCB, Views of experts opined by Fact – Finding Joint Committee) are summarized in subsequent section.

- i. The Fact finding Joint Committee convened three meetings for detailed deliberations on potential causes of the incident that have triggered the toxic gas

generation from sewer, its accumulation and release and resulted in death of 11 people.

Inputs of various stakeholder departments were considered and scientific as well as technical aspects were analyzed. The committee also went through remedial actions taken by the District Administration and other departments immediately after the incident on 30-04-2023 including rescue operations, preventive measure and investigations taken up by the NDRF, Police and District Administration to ascertain the cause of incident.

- ii. The alleged gas leak was confirmed to happen due to leakage/ emission of sewer gas resulting into the incident. As per the reports received from NDRF, high levels of H₂S were detected and the gases which are produced in the sewers such as CO, Methane as flammable gas, etc. H₂S poisoning was also corroborated by medical and forensics evidence and by gas detectors that the incident has most likely occurred due to inhalation of H₂S gas.
- iii. As per the reports of the FFJC including opinion of experts, it has been concluded that H₂S gas generated due to the anaerobic conditions. High concentrations were produced due to stagnation/ choking/ slow velocities in the sewer and the pressure kept on building up which finally released from nearby openings from where it got easy exit.
- iv. Post mortem reports of L M Civil Hospital Ludhiana, Punjab for the deceased state that:

“The cause of death, in this case, is poisoning due to toxic gas inhalation. However, the type of poisoning will be declared after receiving of CE and HPE”

 Reports concluded that the death might have occurred due to inhalation poisoning of toxic gas and type of poisoning mentioned is ‘Not clear’.
- v. Views of following Experts reported in Fact – Finding Joint Committee are summarized as below:
 - **Dr. Anoop Verma, Professor and Head, School of Energy and Environment, Thapar Institute of Engineering and Technology**
 Dr. Anoop Verma visited the site on 01-05-2023 and suggested that the incidence is a case of sewer blockage where anaerobic digestion of organic matter led to

formation of H₂S. During anaerobic digestion/ fermentation, bio-chemical reactions lead to the formation of gases like CO along with gases like H₂S, CH₄, CO₂, NO₂, H₂. Also, H₂S combines with oxygen to form sulphuric acid which eventually can lead to low pH.

Many small slaughter houses, dhabas in close vicinity of affected site could have led to release of huge amount of organic content in sewer lines. Again, this organic content is feeder to anaerobic digestion which ultimately lead to formation of H₂S, CO & other gases. **He opined that if it were the industrial discharge, long stretch of houses would have been affected. However, the diameter of the affected area was limited to 3-4 houses only.**

Further, he made some recommendations to cope up with such future incidents including regular cleaning of sewer lines, provision of vent pipes in sewer lines, mock drills for gas leakage safety & fire from gas by Municipal Corporation, collaboration of Municipal Corporation & other regulatory bodies with institutes of repute to develop state of art technologies to avoid any such incidents.

- **Prof. Sushil Mittal, Vice Chancellor, Sardar Beant Singh State University, Gurdaspur & Prof. Raj Kumar Gupta, Department of Chemical Engineering, Thapar Institute of Engineering and Technology (TIET), Patiala**

The Expert Committee engaged by Punjab PCB in consultation with District Administration comprising of the officials visited the site of incident on 02-05-2023 and reported that the low pH in in the range of 2.5 reported in sewerage samples collected from manholes near affected site indicated anaerobic conditions. pH conditions are reported in the range of 4.4 to 5.7 in upstream and downstream stretches of sewer line which indicate building up of anaerobic conditions only in accident area and sustaining in adjoining pockets. Presence of metals cannot generate H₂S. High conc. of sulphides in the range 56- 60 mg/L as compared to 6-8.8 mg/L in the upstream and downstream have come from anaerobic bio-degradation of organic matter and conversion of sulphates to sulphides especially in the focused stretch of the underground sewer line accompanied with inadequate slime stripping, long detention and insufficient design planning of sewer line.

It was also indicated that high concentrations of iron in the range of 989-1459 mg/L in the affected sewerage pockets as compared to 291-333 mg/l in the upstream and downstream pockets might have come due to solubility of the metal in the acidic conditions converting metal particles to dissolved aqueous form. Presence of metals especially iron, zinc, nickel, chrome in sewerage sample cannot lead to generation of H₂S. Iron and other metals in aqueous medium or iron salts combine with sulphide ions (from H₂S or any other source of sulphide) to immediately convert to highly stable iron / metal sulphide through an irreversible reaction leading to formation of respective metal sulphide. Hence, due to the above mentioned property, metals would never be source of H₂S generation rather they are used as H₂S scavengers to remove sulphide from various streams likely to contain H₂S.

- **Dr. Sheelendra Pratap Singh, Scientist, Regulatory Toxicology, CSIR-Indian Institute of Toxicology Research**

Dr. S.P. Singh vide email dated 23-06-2023 shared a general brief report on formation of H₂S with the Fact Finding Joint Committee. He shared that H₂S is formed from the microbial reduction of the sulphate ions in the absence of oxygen and presence of organic matter such as sludge. It tends to accumulate in confined and poorly ventilated areas. Gas can escape when the system is malfunctioning, loose or damaged. This can happen when organic matter or sludge is disturbed. Blockage in ventilation increase the risk of H₂S back venting, allowing the gas to escape into toilet & other confined spaces through sewerage network. When water is disturbed, the dissolved gas can rapidly turn into toxic gas clouds due to 'soda-can effect'.

Heavy rainfall can cause turbulent flow in sewer systems, leading to disturbance of settled sediments. Sewer sediments often contain accumulated organic matter and sludge that serve as a nutrient source for H₂S combine effect of heavy rainfall and presence of nearby meat shop can lead to an elevated risk of H₂S formation in sewer system.

- **Dr. Ravinder Khaiwal, Professor, Post Graduate Institute of Medical Education and Research, Chandigarh**

Dr. Ravinder Khaiwal endorsed the opinion and statement of CSIR-IITR and opined that sewer gas, no matter of amount cannot escape into homes if properly designed water seal closets (p-traps) are provided. In the residential building of Arti clinic, dry drainage vent (no p-trap/ water closet) could be the likely source of reverse entrance of sewer gas into the houses leading to the fatality. The sludge/ lime deposition due to accumulation/ sedimentation over a long period of time on tragedy site in presence of anaerobic conditions might have led to the formation of H₂S. Sudden turbulence and disturbance of lower sediments/ slime layer due to heavy rain leading to generation of undetected H₂S and its release might also be one of the exacerbating factor. However, the actual fact of the incidence is very difficult to establish since the exact similar conditions which would have prevailed at the time of incident could not be recreated.

vi. Analysis results of NDRF and Punjab PCB

The FFJC has reported that the fatal incidence has occurred at 07.30 am on 30.04.2023. The team of NDRF has analysed CO and H₂S on 30.4.2023 between 01.00 P.M to 10.00 P.M at different intervals. The results are mentioned in Table 1. Punjab PCB has collected samples on 30.4.2023 at 11.30 A.M to 01.40 P.M from manholes for analysis of pH, chloride and sulphide and results are given at **Table 2**.

Table 1: CO and H ₂ S level																
Date / Time	A		B		B1		C		D		D1		D2		E	
30.04.2023	CO	H ₂ S	CO	H ₂ S	CO	H ₂ S	CO	H ₂ S	CO	H ₂ S	CO	H ₂ S	CO	H ₂ S	CO	H ₂ S
1300 Hrs.	-	190	-	195	80	13	-	195	-	180	47	40	47	174	15	10
1700-1800 hrs.	20	0	46	0	92	12	-	15	-	-	29	15	47	18	-	17
1900-2000 hrs.	0	0	80	13	20	0	17	85	46	100	296	1.5	47	17	0-20	15
2200 hrs.	100	200	15	5	20	5	30	85	22	13	25	15	25	15	20	10
01-05-2023																
0030 hrs.	50	7	40	6	14	5	12	10	15	25	5	18	5	11	7	12
0230 hrs.	30	4	12	3	9	3	7	3	30	40	7	3	7	3	7	4
0430 hrs.	5	2	2	5	6	2	0	3	10	15	0	3	0	3	0	3
0630 hrs.	0	4	0	4	0	4	0	4	0	5	0	4	0	4	0	3
1055 hrs.	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2
1600 hrs.	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Readings were taken at surface level																

Table 1: CO and H ₂ S level								
Date / Time	A	B	B1	C	D	D1	D2	E
A-Jasbir Building Material								
B-Transformer								
B1-Opposite to Transformer								
C-NITCO Logistic Private LTD.								
D-Aarti Clinic								
D1-Goyal Coldrink								
D2-Goyal Coldrink								
E-Punjab Emporium								

Table 2: Analytical results of effluent samples collected from Manholes and analyzed by PPCB on 30.04.2023

Sr. No.	Location	Parameters		
		pH	Chloride (mg/L)	Sulphide (mg/L)
A	From Manhole opposite Jasbir Building Material Store (1:00 PM)	4.41	295	8.8
B	From Manhole Near Transformer, Outside Saroj Beauty Parlour (11:30 AM)	2.51	683	56
	From Manhole Near Transformer, Outside Saroj Beauty Parlour (12:20 PM)	4.31	202	6.8
C	From Manhole in the front of Nitco Logistics (P) Ltd. Near Transformer (4:30 PM)	2.58	1541	60
D	From Manhole Opp. Aarti clinic (12:40 PM)	2.59	800	60
E	From Manhole Opposite Dharam Kanda near Punjab Emporium (1:40 PM)	5.74	231	6.0

5.0 INSPECTION AND MONITORING CARRIED OUT BY THE COMMITTEE

The Committee inspected the Giaspura area under investigation and affected households namely M/s Aarti Clinic and M/s Goyal Cold Drinks, Main Sua Road, Giaspura, Ludhiana on 15.12.2023. Samples of sludge and wastewater were collected from 11 manholes (05 main sewers and 06 Branch Sewer). Random inspection of few industrial units in vicinity were also performed.

6.0 OBSERVATIONS MADE BY THE COMMITTEE

(1) The Committee interacted with officials of Punjab SPCB and Municipal Corporation Ludhiana (MCL), Punjab on December 15-16, 2023. Based on the interaction following observations are made:

(i) **Regarding Sewer line**

As per the information provided by PWSSB, the sewer line was commissioned in 2002-03. MCL the agency responsible for Operation and Maintenance of sewer line informed that they allow sewer connections in two categories (domestic and commercial) and there is no bifurcation of commercial / industries. There is no SOP / guidelines for providing NOC / permitting connection to sewer line, maintenance of sewer including desilting of sewer. Copy of written reply letter provided in this regard by MCL vide letter dated 29.12.2023 and PWSSB dated 22.12.2023 are attached as **Annexure-I**.

(ii) Regarding Industrial Establishment

Out of the earlier surveyed 118 industries jointly by PPCB and MCL, it was reported that majority of the units are of tiny and small scale and are white category non-polluting units.

Twenty-two (22) electroplating / pickling / surface finishing industries, etc. were located in 500 meters radius from affected site / location as surveyed after gas leak. Out of 22 units, 15 units are located in upstream of affected area upto Aashirvad Kanda. Beyond Aashirvad Kanda, the flow of main sewer line flows in opposite directions. Remaining 07 units are not falling in catchment of sewer in affected area. List of such 15 and 07 units are attached as **Annexure –II**.

Details of industrial units sending the effluent to CETP for the period of past one year between 01.04.2022 to 30.4.2023 received from CETP- M/s JBR Technologies Pvt Ltd and authorized re - processor are attached as **Annexure-III**.

The records provided by CETP - M/s JBR Technologies Pvt Ltd in form of receipt for lifting of effluent were examined and it was found that the effluent from member units were being lifting by CETP on monthly basis.

(iii) Premises of affected area

It was observed that ground floor of premises of M/S Aarti Clinic was not having proper cross ventilation. There was no p-trap/water seal trap observed inside the premise, which would have checked/stopped of sewer gas from sewer pipe into the

clinic. Further, draining system in the Arti Clinic has connectivity with main sewer line through Houdi without any water seal closet.

Similarly, 02 nos. houdis were found in front of (at the immediate gate of the premises) M/s Goyal Cold Drinks, Main Sua Road, Giaspura, Ludhiana at a distance of around 10-12 feet from sewer line for draining of their domestic sewerage into the sewer pipeline. The shop M/s Goyal Cold Drinks was operating in the ground floor of the premises and the shop was not having sewage generation or sewer connectivity to the houdis or sewer pipeline.

These haudis are escape points of gases released from the sewer pipeline. Both M/s Aarti Clinic and M/s Goyal Cold Drinks lie on same side of the road and sewer pipeline pass through mid of the road. It was also observed that there is no houdi on the other side of the road to that of M/s Aarti Clinic and M/s Goyal Cold Drinks.

- (2) During interaction with Nearby Residents of Goyal Cold Drinks, it was informed that no casualty / impact to passerby/residents was felt on the other side of the road where there is no houdi and residential establishments.
- (3) It is pertinent to mention that the deaths at Aarti clinic occurred inside the premises. While in case of Goyal Cold Drinks, persons near to the Houdi got impacted and deaths occurred as informed by the residents / eye-witness on the faithful day.
- (4) Cluster of meat shops and a few dhabas were observed at about 40 - 50 m upstream of M/s Aarti Clinic.
- (5) Analytical results of Physio-Chemical parameters in Wastewater Samples collected from manholes of main sewer and branched sewer on 15.12.2023 are given below:

S. No.	Sampling Location	Physiochemical Parameters of Manhole Sewer Samples								
		pH	COD (mg/L)	BOD (mg/L)	TDS (mg/L)	Conductivity (μ ohm/cm)	Sulphide (mg/L)	NH ₃ -N (mg/L)	Chloride (mg/L)	Sulphate (mg/L)
1.	Front of M/s NITCO Logistic (P) Ltd. Near transformer	6.2	2148	1250	4770	8416	4.0	29	383	2326

S. No.	Sampling Location	Physiochemical Parameters of Manhole Sewer Samples								
		pH	COD (mg/L)	BOD (mg/L)	TDS (mg/L)	Conductivity (μ ohm/cm)	Sulphide (mg/L)	NH ₃ -N (mg/L)	Chloride (mg/L)	Sulphate (mg/L)
	(near Point C in figure 1)									
2.	From Manhole near transformer, Outside Saroj Beauty Parlour (near Point B in figure 1)	6.4	2298	1305	4680	8992	3.6	31	412	2162
3.	From Manhole Jasbir Building Store (near Point A in figure 1)	6.4	2840	1687	5780	9416	4.0	34	490	2788
4.	From Manhole Goyal Coldrink (near Point D in figure 1)	6.4	2218	1232	5000	8914	4.4	28	431	2448
5.	Dharm Kanda Punjab Emporium (near Point E in figure 1)	6.5	2678	1547	5230	8649	3.6	32	480	2298
6.	Industrial area C, Sua Road front of Techno Mobile Centre (near Point T1 in figure 1)	6.4	2224	1235	4940	8414	4.0	30	441	2108
7.	Branch Sewer Manhole front of Kirti Tea Stall (near Point T2 in figure 1)	6.5	3290	1900	5910	9810	6.4	35	529	2910
8.	Manhole adjacent M/s Godavari Steel Traders (near Point T3 in figure 1)	5.4	3796	2040	6760	9998	6.0	36	568	2992
9.	Manhole front of S.K. Auto Centre (near Point T4 in figure 1)	5.5	4038	2230	6920	10990	4.8	39	617	3087
10.	Manhole front of Deepak Karayana Store	6.3	2340	1343	4890	8398	3.2	27	421	2203

S. No.	Sampling Location	Physiochemical Parameters of Manhole Sewer Samples								
		pH	COD (mg/L)	BOD (mg/L)	TDS (mg/L)	Conductivity (μ ohm/cm)	Sulphide (mg/L)	NH ₃ -N (mg/L)	Chloride (mg/L)	Sulphate (mg/L)
	(near Point T5 in figure 1)									
11.	Manhole front of Aashirwad Computerized weight bridge (near Point T6 in figure 1)	6.4	3058	1768	5210	9922	4.0	28	402	2149

It is evident from above monitored data that wastewater flowing in sewer contains high organic load as BOD ranges between 1232 mg/l to 2230 mg/l. Sulphate ranges between 2108 mg/l to 3087 mg/l.

➤ Analytical results for Heavy Metals in Wastewater Samples Collected from manholes of main sewer and branched sewer are given below:

S. No.	Sampling Location	Heavy Metals Parameters									
		As (mg/L)	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Ni (mg/L)	Pb (mg/L)	Zn (mg/L)
1.	Front of M/s NITCO Logistic (P) Ltd. Near transformer (near Point C in figure 1)	BDL	BDL	0.013	0.177	0.168	69.72	0.726	0.145	0.052	0.979
2.	From Manhole near transformer, Outside Saroj Beauty Parlour (near Point B in figure 1)	BDL	BDL	0.006	0.073	0.111	29.84	0.411	0.048	0.035	0.578
3.	From Manhole Jasbir Building Store (near Point A in figure 1)	BDL	0.003	0.010	0.470	0.305	29.36	0.651	0.054	0.058	2.492
4.	From Manhole Goyal Cold Drink (near Point D in figure 1)	BDL	BDL	0.006	0.146	0.088	53.18	0.686	0.071	0.029	0.655
5.	Dharm Kanda Punjab	BDL	BDL	0.012	0.183	0.171	63.52	0.780	0.113	0.041	0.674

S. No.	Sampling Location	Heavy Metals Parameters									
		As (mg/L)	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Ni (mg/L)	Pb (mg/L)	Zn (mg/L)
	Emporium (near Point E in figure 1)										
6.	Industrial area C, Sua Road front of Techno Mobile Centre (near Point T1 in figure 1)	BDL	BDL	0.016	2.869	2.189	141.04	0.927	0.087	0.102	14.53
7.	Branch Sewer Manhole front of Kirti Tea Stall (near Point T2 in figure 1)	0.023	0.007	0.019	4.708	11.33	94.69	1.117	0.105	0.265	38.33
8.	Manhole adjacent M/s Godavari Steel Traders (near Point T3 in figure 1)	0.244	0.014	0.132	23.45	9.344	438.4	4.347	0.635	0.599	26.68
9.	Manhole front of S.K. Auto Centre (near Point T4 in figure 1)	0.298	0.045	0.496	80.10	23.90	1562.3	24.90	7.397	0.999	304.1
10.	Manhole front of Deepak Karayana Store (near Point T5 in figure 1)	BDL	BDL	0.005	0.159	0.167	9.321	0.309	0.028	0.027	0.907
11.	Manhole front of Aashirwad Computerized weight bridge (near Point T6 in figure 1)	BDL	0.005	0.011	0.624	0.383	62.16	0.813	0.095	0.120	3.698
13.	Ballope STP 152 MLD (Inlet)	BDL	BDL	BDL	0.257	0.059	10.10	0.159	0.063	0.019	0.813
14.	Ballope STP 152 MLD (Outlet)	BDL	BDL	BDL	0.174	0.052	13.21	0.269	0.041	0.012	0.808

It is evident from above monitored data that wastewater flowing in sewer contains high metal concentration in terms Iron (9.3 mg/l to 1562.3 mg/l), Zinc (0.57 mg/l to 304.1 mg/l).

➤ Analytical results of Sludge of manholes wrt Heavy Metals are given below:

S. No.	Sampling Location	Heavy Metals Parameters of Sludge Sample									
		As (mg/L)	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Ni (mg/L)	Pb (mg/L)	Zn (mg/L)
1.	Front of M/s NITCO Logistic (P) Ltd. Near transformer (near Point C in figure 1)	0.019	0.013	0.106	1.301	1.383	483.13	3.497	0.990	0.366	9.282
2.	From Manhole near transformer, Outside Saroj Beauty Parlour (near Point B in figure 1)	0.180	0.092	0.559	4.269	8.950	1612.9	23.30	3.497	1.173	43.18
3.	From Manhole Jasbir Building Store (near Point A in figure 1)	BDL	0.012	0.105	1.788	2.900	139.33	7.097	0.377	0.107	18.08
4.	From Manhole Goyal Cold Drink (near Point D in figure 1)	0.036	0.021	0.164	2.130	2.258	700.63	5.697	2.097	0.570	14.78
5.	Dharm Kanda Punjab Emporium (near Point E in figure 1)	BDL	0.007	0.059	0.688	0.757	223.23	2.397	0.512	0.190	3.404
6.	Manhole adjacent M/s Godavari Steel Traders (near Point T3 in figure 1)	0.170	0.011	0.066	16.00	6.007	446.43	3.197	0.298	0.361	17.48
7.	Manhole front of S.K. Auto Centre (near Point T4 in figure 1)	0.185	0.034	0.400	55.00	18.49	1154.9	17.30	6.597	1.106	232.38
8.	Manhole front of Deepak Karayana Store (near Point T5 in figure 1)	BDL	0.021	0.102	1.144	2.648	134.73	3.497	0.293	0.339	11.48
9.	Manhole front of Aashirwad	BDL	0.081	0.068	3.031	1.472	346.83	3.197	1.346	0.509	11.38

S. No.	Sampling Location	Heavy Metals Parameters of Sludge Sample									
		As (mg/L)	Cd (mg/L)	Co (mg/L)	Cr (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Ni (mg/L)	Pb (mg/L)	Zn (mg/L)
	Computerized weight bridge (near Point T6 in figure 1)										
10.	Baloke STP (152 MLD)	BDL	0.26	0.63	60.42	13.44	5030.21	13.55	24.09	4.58	233.66

- Giaspura Sewer line is terminated to STP located in Baloke. Samples collected from inlet of the STP and results placed in table below:

Sampling Location	Sampling Location	Physiochemical Parameters of STP Samples							
		pH	COD (mg/L)	BOD (mg/L)	TDS (mg/L)	Conductivity (μohm/cm)	NH ₃ -N (mg/L)	Chloride (mg/L)	Sulphate (mg/L)
Baloke STP 152 MLD	Inlet	7.0	754	328	710	1410	17	78	95

It is evident that significant variation was observed in BOD, COD, Sulphate and Chloride concentration in sewer samples collected from manholes near investigation / affected area and inlet to said STP indicates possibility of discharge of industrial effluent in sewer line.

- (6) A team from CPCB, RD Chandigarh carried out visit of the Giaspura, Ludhiana on 20.12.2023 as directed by joint committee to assess process effluent generation and their management in a few units randomly and also assess sewer connections by the units / other premises around the affected area. The following observations are made by the team:

- (a) 04 Red category units were selected from 200 m to 500 m radius up stream of the adjacent affected area of gas leak and these were visited to verify the effluent generation and its treatment mechanism. At the time of inspection these units were found in operation. All these units are members of CETP. Team observed that effluent generation through pre-post rinsing waste water after plating/acid bath is collected in effluent storage collection tank provided by these units within their premises and the same is lifted by CETP through GPS enabled tankers after on-line booking by the unit. These units are small units mainly engaged in job work and the quantum of effluent generation is very less.

(b) Based on records provided by the unit as well as M/s JBR (the CETP operator) generated receipt/manifest for one year i.e. from 1.4.2022 to 30.4.2023, it was found that there were no discrepancy of the same. The amount of water consumption as reflected in water meters installed by these units was found in synchronization with the effluent lifted by the CETP operator as per verification made from the records as well as manifest data. As per consent, domestic effluent is permitted to be discharged into sewer.

(c) Most of the units located in the region are white category machining units and are exempted from consent management. Inspection of 03 white category units located at upstream of the gas leak site has also been carried out to see the engaged activities. These units are mostly engaged in dry work i.e. trading of iron parts, welding, Fabrication and machining of auto parts etc. Domestic effluent/rain water are discharged through houdis into the branch sewer line from these units. Drainage pipe was provided at the personal houdi of white category units for discharge of rain water.

These white category units are engaged in machining works of iron parts and, Fine Iron particles in powder form may enter the sewer line along with domestic effluent/storm water through floor cleaning as well as hand washing from these white category units.

(d) The area is crowded residential establishments with migrant labours who work in industries. At the upstream of the tragedy point, there are a lot of dormitories type establishments which are called vehras in local terms. In these small dormitories, many families live in a very small area.

Three residential establishments were visited at branch sewer line at upstream of the Gas leak site. In one residential establishment around 20 persons were found residing in a plot of 150 square yards and in another establishment of about 180 square yards, nearly 50 persons were also found residing.

(e) A cluster of meat shops exists at the upstream area of the affected site. Further, there are many tiny shops on the upstream area.

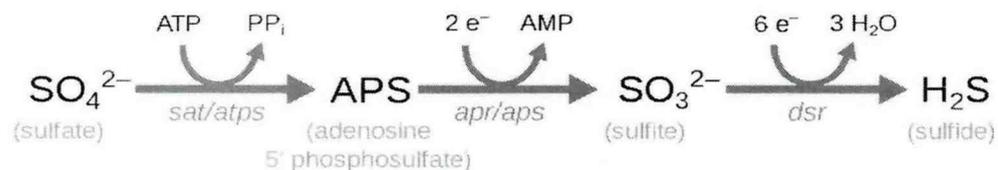
- (f) During visit 02 commercial establishment as well as 03 residential establishment located at around 40m-200m radius up stream of the affected area, the toilets as well as houdis were verified and p-traps/water seal traps were found at all the Indian/western toilets and in observed haudis except in the affected premises (M/s Aarti Clinic, Main Sua Road, Giaspura, Ludhiana). All these establishments are connected to the branch sewer line through a closed houdi and the branch sewer line is further connected to the Sua Road main sewer line.

7.0 CONCLUDING REMARKS – FINDINGS

Based on the above observations mentioned in **para 6.0**, following findings are made:

7.1 FORMATION OF H₂S

- The rate of hydrogen sulfide generation is proportional to the biochemical oxygen demand (BOD₅) and excess sulfates are available. Based on analysis results of samples collected from manholes of main sewer and branched sewer near / in vicinity and radius of affected area it was found that Sulfates values in sewer lines ranges between 2149 mg/l to 3087 mg/l and BOD concentration ranges between 1235 mg/l to 2230 mg/l. This condition facilitated high rate of H₂S generation.
- Domestic Wastewater and solid waste discarded from meat shops located in the catchment are rich in sulfur-containing proteins. As the substrate of sulfate-reducing bacteria (SRB), the sulfur in sludge has been considered as a key factor affecting the competition between sulfate-reducing bacteria (SRB) and methane-producing bacteria (MPB), and sulfate reduction reaction increases with increasing the sulfur concentration. As per Table 1 analysis values of samples taken by NDRF team on 30.04. 2023, H₂S values at 1300 hrs are ranging from 174 ppm to 195 ppm between the Points A to D (Figure 1), which confirms the heavy presence of this gas in the main sewer.



Further, the colour of sludge deposited on inside of manhole cover was found to be black as reported by representative of MCL to this committee during its visit, which

confirms non-formation of methane, since methane formation develops white colour slime on inside of manhole cover. The black colour can also be observed from the photograph of the manhole cover taken on day of incidence i.e 30.04.2023 provided by representative of Ludhiana Police attached as **Annexure-IV**.

- H₂S formation from reaction of metal sulfide with mineral acids like dilute H₂SO₄, HCL and Nitric acid

The Example Reaction:



However, from this reaction stoichiometry, 2.6 times FeS is needed for every 1 gram of H₂S produced and similarly, 2.8 times Sulfuric acid is needed.

The values of Sulphides stated in Table 3 ranges between 3.2 mg/l to 6.4 mg/l which is very low for producing such high amounts of H₂S causing the fatalities.

- The pH of the wastewater flowing in sewer line upstream and downstream of Aarti Clinic was found to be ranging between 6.2 to 6.5 during the visit by this committee on 15.12.2023. Such pH range is favorable for SRB to form maximum H₂S. Figure 3 depicts the SRB growth vs pH.

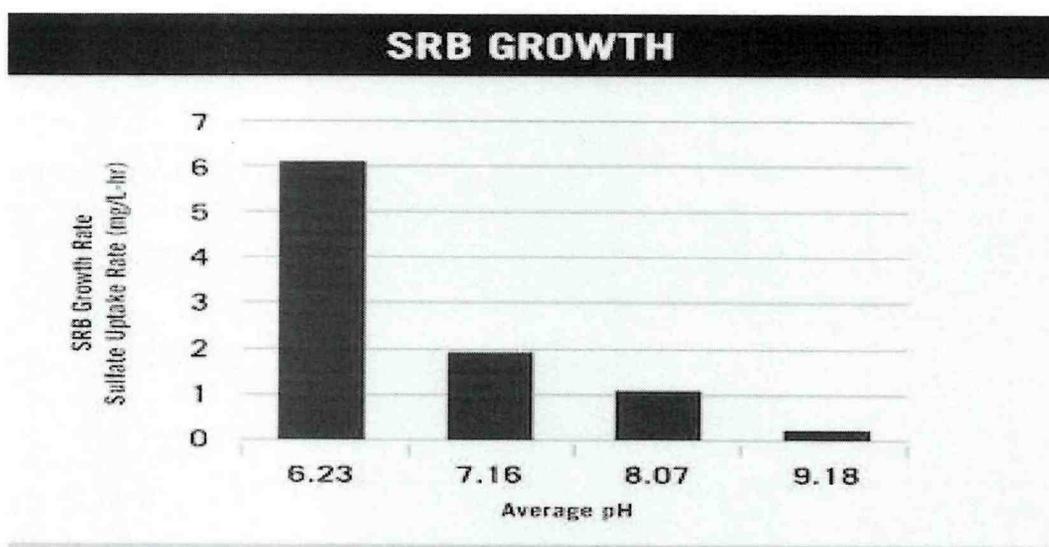


Figure 3: SRB growth vs pH

7.2 POSSIBLE REASONS FOR LOW PH (2.51 TO 5.74) MONITORED IN THE SAMPLES COLLECTED ON 30.04.2023 AFTER THE INCIDENT

- Some hydrogen sulfide gas diffuses into the headspace environment above the wastewater. Moisture evaporated from warm sewage may condense on unsubmerged walls of sewers, and is likely to hang in partially formed droplets from the horizontal crown of the sewer. As a portion of the hydrogen sulfide gas and oxygen gas from the air above the sewage dissolves into these stationary droplets, they become a habitat for sulfur oxidizing bacteria (SOB), of the genus *Acidithiobacillus*. Colonies of these aerobic bacteria metabolize the hydrogen sulfide gas to sulfuric acid. Favorable conditions for Sulfur Oxidizing bacteria (SOBs) and acid regression may be the cause for reducing the pH to 2-3.
- Sudden acidification in the short stretch under consideration by accidental/illegal discharge of acidic effluent into the sewer around the sampling time at 11.30 A.M to 01.40 P.M on 30.04.2023 may not be ruled out.

7.3 IMPACT OF SODA-CAN EFFECT

H₂S has high solubility in water i.e 10 times more soluble in water than carbon dioxide. A sewer main can contain huge amounts of undetected H₂S dissolved in the wastewater. As a result of the “soda-can effect,” this can turn into gaseous toxic clouds when the water is disturbed.

Heavy rainfall on the earlier night on 29.04.2023 causing heavy flow of storm water may have caused accumulation of sludge to the sewer pipeline at the affected area. As per record of IMD, Chandigarh, the rainfall intensity is reported to be 16mm on 29.04.2023. The storm water laden with sewage sludge draining into the under designed main sewer and obstruction of sewer (probably due to sludge deposition and waste from meat shops in the upstream) could have reduced the head space in the sewer pipelines. This along with the storm/heavy rain created turbulence could have led to what is known as a “soda-can” effect, creating back pressure and releasing this H₂S toxic sewer gas through the sewer branches from the unsealed houdis’ connected to the sewer line. The same is supported by the fact that people on opposite side of the affected roadside, where there is no houdi/manhole, remained unaffected.

7.4 POSSIBLE CAUSE OF GAS LEAK

- As there were no ventilating gullies in the main sewer line on affected sited in Figure 1, the toxic H₂S sewer gas could have travelled into branch sewer connected to the houdis of Aarti Clinic and Goyal Cold Drink. The same is supported by the fact that people on opposite side of the affected roadside, where there is no houdi, remained unaffected.
- Further, it may be noted that this H₂S gas from sewer could have diffused all night on 29th April from the houdi into the ground floor of the affected premises Aarti Clinic, which were closed & unventilated, through their domestic sewer pipes under the wash basin and adjacent to it which are connected with the said houdi directly (without any “P” or “O” seals which prevent gas flow) and also into the houdis of the sewer branch of M/s Goel store. The elevation drawings of the houdis and their connection to main sewer with manholes are depicted in drawing attached at **Annexure-V**.
- The H₂S being denser than air, and therefore, the ground floor of closed unventilated Aarti Clinic could have turned into a toxic gas chamber with H₂S gas concentration reaching dangerous levels by the early morning of 30th April 2023.
- In case of fatalities at M/s Goyal Cold Drink, the H₂S being heavier accumulated near the haudi connected to sewer line reached to dangerous concentration. The persons when came in close proximity to not properly covered the said houdis of M/s Goyal Cold Drink, inhaled H₂S and fell down and further inhaled peak concentration at floor level resulting death depending upon contact duration and his /her immunity / health conditions. Pet dog which was tied with chain on roof was found safe and alive (as reported by FFJC) supports such possibilities.

8.0 RECOMMENDATIONS

In order to avoid such incident in future, following actions need to be taken-up by respective authorities:

1. MCL shall develop SOP for providing NOC / permitting houses' connection to sewer line only with “P” or “O” seals or other suitable seals to prevent gas flow from sewer

line, and also for maintenance of sewer including desilting of sewer. Periodic monitoring shall be carried out by respective agencies.

2. MCL shall ensure proper plumbing plan of households while sanctioning building plan and providing proper sewer / water connections to households ensuring P-type, S-type, Water seal, etc. to avoid flow of sewer gas into houdis or houses.
3. MCL shall spread awareness among local people about such plumbing practices and also benefits of P- Trap, S Trap and Water seal. It shall be ensured no houses/premises have sewer connections without such plumbing connections.
4. Separate storm water drainage system need to designed and constructed so that load of sewer line will be minimized. Schemes for proper augmentation of Sewerage network shall be taken-up to meet present and future wastewater load as per manual of Central Public Health and Environmental Engineering Organisation (CPHEEO).
5. The industrial units located upstream of the manholes of branch sewer (from sampled location in front S K Auto Center and adjacent to M/s Godavari Steel Traders), where high concentration of Fe, Cu, Cr and Ni were observed, shall be regularly inspected by Punjab SPCB ensuring that wastewater / sludge from such units are not disposed into sewer.
6. Punjab PCB shall also ensure that industrial units which are members of CETP should have storage tanks with adequate capacities and their lifting frequency shall commensurate with the storage capacity.
7. MCL shall provide vent / ventilation shaft at appropriate safe locations in sewer pipelines as per manual of CPHEEO to avoid accumulation of gas in sewer lines.
8. MLC shall monitor concentration of H₂S and CH₄ gases in sewer line on regular intervals in city.



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Raja Ram Singh,
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Bharat Kumar Sharma
Member Secretary,
CPCB

ਪੰਜਾਬ ਵਾਟਰ ਸਪਲਾਈ ਅਤੇ ਸੀਵਰੇਜ ਮੰਡਲ, ਲੁਧਿਆਣਾ

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ਸੇਵਾ ਵਿਖੇ

ਕਾਰਜਕਾਰੀ ਇੰਜੀਨੀਅਰ,
ਜ਼ੋਨ-ਸੀ, ਓਐੱਡਐਮ ਸੈੱਲ,
ਨਗਰ ਨਿਗਮ, ਲੁਧਿਆਣਾ।

ਨੰਬਰ: 7102

ਮਿਤੀ: 22-12-2023

ਵਿਸ਼ਾ :- NGT Matter in Original Application No. 327 of 2023; New Item published in India Today dated 30.04.2023 titled "3 minors among 11 dead in Ludhiana Gas Leak, Punjab Govt. announces Rs. 2 Lakh ex-gratia.

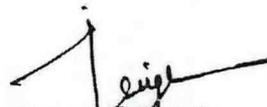
ਹਵਾਲਾ :- ਆਪ ਜੀ ਦੇ ਦਫਤਰ ਦਾ ਪੱਤਰ ਨੰ.231/XEN-C/O&M ਮਿਤੀ 20-12-2023.

ਉਪਰੋਕਤ ਵਿਸ਼ੇ ਸਬੰਧੀ ਹਵਾਲੇ ਅਧੀਨ ਪੱਤਰ ਨਾਲ ਆਪ ਜੀ ਦੇ ਵੱਲੋਂ ਭੇਜੇ ਗਏ ਨੱਥੀ ਪੱਤਰ ਦੇ ਲੜੀ ਨੰ. 5 ਅਤੇ 6 ਦੇ ਸਬੰਧੀ ਡਿਟੇਲ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਹੈ :-

Sr No.	Description	Area and Population as per Design Statement	Actual discharge as per Design Statement	Design discharge as per Design Statement	Remarks
1.(a) & (b)	i) N/10/1 to N/1 (30" i/d)	120 Acre @150 person per acre =18000 person	3.56 Cusecs	7.02 Cusecs	
	ii) N/22 to N/10/8 (30" i/d)	116.90 Acre @150 person per acre =17535 person	2.84 Cusecs	7.02 Cusecs	
2.(c)	Year of Commissioning is 2002-2003.				

ਇਸ ਤੋਂ ਇਲਾਵਾ ਬੇਨਤੀ ਸਹਿਤ ਲਿਖਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਲੜੀ ਨੰ. 5 ਦੇ (ਪਾਰਟ d, e) ਅਤੇ ਲੜੀ ਨੰ. 6 ਦੀ ਕਾਰਵਾਈ ਆਪ ਦੇ ਆਪਣੇ ਪੱਧਰ ਤੇ ਕੀਤੀ ਜਾਣੀ ਹੈ ਜੀ। ਇੱਥੇ ਆਪ ਜੀ ਨੂੰ ਇਹ ਵੀ ਸੂਚਿਤ ਕੀਤਾ ਜਾਂਦਾ ਹੈ ਕਿ ਸਬੰਧਤ ਏਰੀਏ ਦੀ ਮੰਗੀ ਗਈ ਅਪਰੂਵਡ ਡਿਜ਼ਾਇਨ ਸਟੇਟਮੈਂਟ ਸਮੇਤ ਡਰਾਈਂਗ ਅਤੇ ਲੈਵਲਾਂ ਸਬੰਧੀ ਪ੍ਰਫੇਰਮਾ ਟਾਈਪ ਕਰਵਾ ਕੇ ਪਹਿਲਾਂ ਹੀ ਇਸ ਦਫਤਰ ਦੇ ਪੱਤਰ ਨੰ. 2852 ਮਿਤੀ 18.05.2023 ਨਾਲ ਆਪ ਜੀ ਦੇ ਦਫਤਰ ਨੂੰ ਭੇਜਿਆ ਜਾ ਚੁੱਕਾ ਹੈ ਜੀ।

ਇਹ ਆਪ ਦੀ ਸੂਚਨਾਂ ਅਤੇ ਅਗਲੀ ਕਾਰਵਾਈ ਹਿੱਤ ਹੈ ਜੀ।


ਕਾਰਜਕਾਰੀ ਇੰਜੀਨੀਅਰ
ਪੰਜਾਬ ਵਾਟਰ ਅਤੇ ਸੀਵਰੇਜ ਮੰਡਲ,
ਲੁਧਿਆਣਾ
ਪੰਜਾਬ
22-12-23

To,

Environmental Engineer,
Regional Office-2,
Ludhiana.

No. 239/XEN-C/09MDated 29-12-2023

Subject:- NGT matter in Original Application no.327 of 2023 News Item Published in India Today Dated 30.4.2023 titled "3 minors among 11 dead in Ludhiana Gas Leak in Punjab govt. Announce Rs. 2 lakh Ex-Gratia-reg.

Ref.:- CPCB letter no.RD-CHD/Tech/Co-ordination/228-A/220 dated 19.12.23.

In reference to the subject matter and CPCB letter no.RD-CHD/Tech/Co-ordination/228-A/220 dated 19.12.23, it is stated that point no.3,5 (d,e) & 6 of CPCB letter no. is related to MCL & point no.5 (a,b,c) is related to Sewerage board. The report of MCL & Sewerage has been prepared which is mentioned below:-

1. With respect to the Sr.no.3 of CPCB letter, it is stated that MCL allows sewer connections in two categories only i.e. domestic, commercial and there is no further bifurcation of commercial /Industries in red or white or any other categories. So the list of MCL approved Industrial/Commercial connections is attached as Annexure-A.
2. The report of sewer board regarding point no.5 (a,b,c) is attached as Annexure-B.
3. It is stated with respect to the point no.5(d) of CPCB letter that there is no such data available for the population of the particular area of Giaspura. As per the report of Census 2011 population of Ludhiana City was calculated but no further bifurcation was made on the basis of areas.
4. The desilting of sewer lines is done on the basis of physical verification of the Officer incharge and there is no such SOP guidelines of Municipal Corporation/ Local Body Department for cleaning of desilting of the sewer.
5. The report regarding pictorial diagram of incident houses has been prepared by building branch of MCL and the same has been attached as Annexure-C.



Executive Engineer,
Zone-C, O&M cell,
Municipal Corporation Ludhiana.

List of Industries Situated in adjoining area of Sua road (near gas leak incident area) Giaspura

Sr. No.	Name	ID No.	Address	Water Sewerage Connection
1	Arora steels Sua road Industry area-C	4295	B-29, 536/25/1-A/2 Sua road ind. Area-C, Nanaksar Kanda, Giaspura	Yes
2	Krishna Engineering	282898	B-29, 536/25/A Sua road ind. Area-C Giaspura	Yes
3	Satnam Enterprises	24076	B-29, 536/25/A/1 Sua road ind. Area-C Giaspura	Yes
4	Godavari steel traders (9803279632)	264665	B-29, 536/25/5 Sua road ind. Area-C Giaspura	Yes
5	Naveen car repair and washing	264665	B-29, 536/25/4 Sua road ind. Area-C Giaspura	Yes
6	Champion Bikes (8837113004)	264664	B-29, 536/25/5A Sua road ind. Area-C Giaspura	Yes
7	Formative Engg. Pvt. Limited (9646278699)	2051	B-29, 536/25-C Sua road ind. Area-C Giaspura	Yes
8	Champion auto tech (7696200008)	240414	B-29, 536/25-6A Sua road ind. Area-C Giaspura	Yes
9	Beant Industries	256372	B-29, 536/25/6 Sua road ind. Area-C Giaspura	Yes
10	D.K.T. company	267551	B-29, 536/25/C/1 Sua road ind. Area-C Giaspura	Yes
11	Bhole steel Industries	235025	B-29, 536/25-C/1 Sua road ind. Area-C Giaspura	Yes
12	Malwa Auto Enterprises (9814009381)	238916	B-29, 536/25/2-C Sua road ind. Area-C Giaspura	Yes
13	Nirmal Sales Corporation(9876600890)	234898	B-29, 536/25-C/2 Sua road ind. Area-C Giaspura	Yes
14	Shivam Auto Industries(9814384728)	234901	B-29, 536/25/3-A Sua road ind. Area-C Giaspura	Yes
15	J.P Electric control system (9814107088)	281128	B-29, 536/25/3-A2 Sua road ind. Area-C Giaspura	Yes
16	Kalsi International (9814643600)	283236	B-29, 536/25/3A/3A Sua road ind. Area-C Giaspura	Yes
17	Harmindera International	3937	B-29, 536/25C/2 Sua road ind. Area-C Giaspura	Yes
18	Kanav Kunal Industries (9814140404)	296698	B-29, 536/25C/2-4 Sua road ind. Area-C Giaspura	Yes
19	Vikas Industries Unit-I	3582	B-29, 536/25 Sua road ind. Area-C Giaspura	Yes
20	Vikas Industries Unit-II	3582	B-29, 536/25-1 Sua road ind. Area-C Giaspura	Yes
21	Ram Lal Ramesh Kumar Industries(941777505)	243369	B-29, 536/25/1 Sua road ind. Area-C Giaspura	Yes
22	Satnam Casting C/A29/1673 (7589300131)	162331	B-29, 536/25/2 Sua road ind. Area-C Giaspura	Yes
23	Pullman Sales corporation C/A29/1681 (987603367)	210018	B-29, 536/25/A/2 Sua road ind. Area-C Giaspura	Yes
24	Chhabra Forging A/29/1669 (9814044427)	1669	B-29, 536/25/A Sua road ind. Area-C Giaspura	Yes
25	Sangam Packers (9915205600)	1683	B-29, 536/25-B Sua road ind. Area-C Giaspura	Yes
26	Arsh Steel traders (9815506953)	234896	B-29, 536/25-B Sua road ind. Area-C Giaspura	Yes
27	Iqbal Son Engineering works	12829	B-29, 536/25-B/1/1 Sua road ind. Area-C Giaspura	Yes
28	Satnam Foundary Works (7889309130)	782180	B-29, 536/25-B/1/1 Sua road ind. Area-C Giaspura	Yes
29	Ganpati Packers(9316923523)	234894	B-29, 536/25-B/1 Sua road ind. Area-C Giaspura	Yes
30	Parkes Industries 9417284193	257824	B-29, 536/23 Sua road ind. Area-C Giaspura	Yes
31	Aman Cycle Industries 9815555513	294940	B-29, 536/25-B-4 Sua road ind. Area-C Giaspura	Yes
32	Brosis International	234891	B-29, 536/25 Sua road ind. Area-C Giaspura	Yes

33	Maiwa steel Industries 0988884455	178538	B-29, 536/25/3B Sua road ind. Area-C Giaspura	Yes
34	Aark International 9417780133	231901	B-29, 536/25/3A Sua road ind. Area-C Giaspura	Yes
35	King Industry Unit-II 9417234471	3582	B-29, 536/25/1A Sua road ind. Area-C Giaspura	Yes
36	Dharampal & Sons Industries	716951	B-29, 536/25/3 Sua road ind. Area-C Giaspura	Yes
37	R K Export Industries	231890	B-29, 536/25/3 Sua road ind. Area-C Giaspura	Yes
38	Kano Industry Unit-I 9417234471	3582	B-29, 536/25/1B Sua road ind. Area-C Giaspura	Yes
39	Yoonemari Manufactures Industries 9417234471	3582	B-29, 536/25/3-1 Sua road ind. Area-C Giaspura	Yes
40	Vikas Industries 9417234471	234896	B-29, 536/25-A1 Sua road ind. Area-C Giaspura	Yes
41	H-Mac Engineering 9876607348	4088	B-29, 536/25/3/1B Sua road ind. Area-C Giaspura	Yes
42	Jackson India Industries	398614	B-29, 536/25/2-B Sua road ind. Area-C Giaspura	Yes
43	Dawinder Cycle Industries (9815233077)	247589	Ac 247589	Yes
44	Kanwal Ingg. Works	247589	B-29, 536/25/3/2 Sua road ind. Area-C Giaspura	Yes
45	Gujrat cycle industries 9814123976	3583	B-29, 536/25/2 Sua road ind. Area-C Giaspura	Yes
46	Bir Industries Unit-I 9216549785	3544	B-29, 536/25B/10 Sua road ind. Area-C Giaspura	Yes
47	Mehak Engineering 9216549785	3555	B-29, 536/25 B/1/5 Sua road ind. Area-C Giaspura	Yes
48	Bir Industries Unit-II 9216549785	256641	B-29, 536/25B-14 Sua road ind. Area-C Giaspura	Yes
49	Shri Krishna steel Industries 9814207361	1659	B-29, 536/25/1-4 Sua road ind. Area-C Giaspura	Yes
50	Sarla Treading Company 9417449064	248400	B-29, 536/25/2/1 Sua road ind. Area-C Giaspura	Yes
51	Uniwel Impex	257827	B-29, 536/25/B/1/2 Sua road ind. Area-C Giaspura	Yes
52	Auto Engineering-I 9356609944	286300	B-29, 536/25/2-A Sua road ind. Area-C Giaspura	Yes
53	Auto Engineering-II	256332	B-29, 536/25/2 Sua road ind. Area-C Giaspura	Yes
54	Anupam Industries	256440	B-29, 536/25/2-C Sua road ind. Area-C Giaspura	Yes
55	Sharma Tractor Industries	257828	B-29, 536/25/1/B Sua road ind. Area-C Giaspura	Yes
56	RK Enterprises	256333	B-29, 536/25-B/1/1 Sua road ind. Area-C Giaspura	Yes
57	Shri Krishna steel Industries	1659	B-29, 536/26-B Sua road ind. Area-C Giaspura	Yes
58	RS Steel Industries	268331	B-29, 536/26-B-1 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
59	Davinder Cycle Industries 9815255077	247589	B-29, 536/25/3 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
60	Amar Industries	238934	B-29, 536/25/6 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
61	Garg Cycle Industries 8360615477	256093	B-29, 536/25/6/1 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
62	Suri Ram Forging 9888326165	731669	B-29, 536/24 Sua road ind. Area-C Giaspura	Yes
63	Shri Ram Forging	no connection	B-29, 536/26/2 Sua road ind. Area-C Nanaksar Kanda Giaspura	No
64	Maharaja Enternational-I 8054925257	1595	B-29, 536/26/3 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
65	Maharaja Enternational-II 8054925257	320350	B-29, 536/26/3A Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
66	Maharaja Enternational-III 8054925257	320352	B-29, Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
67	Hexa Company 9878880640	238950	B-29, 536/26-2 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes

68	Batra Auto Industries 9888568211	310313	B-29, 536/26-1 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
69	Bhardwaj Steel Industries 9872702345	12840	B-29, 536/26 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
70	Fine trading company 9872411054	2176	B-29, 536/26-6 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
71	Fyrest Enterprises	12838	B-29, 536/11 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
72	Apna Ram Chawla & Sons Indus	154169	B-29, 536/13 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
73	Ramdyr Machine Tools 9815099838	12834	B-29, 536/26-3-A1 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
74	Shivalik cycle Industries 7973111011	291912	B-29, 536/11 Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
75	National Auto Mobiles 9117078118	212591	B-29, 536/26-3-B Sua road ind. Area-C Nanaksar Kanda Giaspura	Yes
76	Sharma Lampet 9417848793	326731	B-29, 536/10-C Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
77	Coop Steel company	272701	B-29, 536/28-1-C Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
78	Sudhana wire industry 814660641	89084	B-29, Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
79	Saryay Designer seating Industry 7507516000	840559	B-29, 536/28-1 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
80	JM Enterprises	286302	B-29, 536/28-2 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
81	Bull Fastners Industry	222474	B-29, 536/28D Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
82	Akash Inds.	268157	B-29, 536/28 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
83	Hardeep Inds. 9815022617	2527	B-29, 536/28-C/1 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
84	Dugri Inds.	268782	B-29, 536/28D/2A Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
85	Aeropolis steel ugyog 9516570007	17699	B-29, 536/28-C-2 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
86	DND casting inds.	267550	B-29, 536/28-C Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
87	Rajput steel udyod Inds.	368412	B-29, 536/28/A Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
88	Shri coat Inds.	2538	B-29, 536/28 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
89	Accurate Engineers Inds.	270203	B-29, 536/28-B/1 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
90	RD steel pvt. Ltd.	Not Passed	B-29, 536/29 Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
91	SD products	closed	B-29, 536/28 B Sua road ind. Area-C Ashirbad Kanda Giaspura	Yes
92	Wadhawan Engineers	296449	B-29, 458/22/2B Makkar colony st.no.4 Sua road Giaspura	Yes
93	Abhishek Enterprises Sua road makkar colony giaspura(9814712750)	244832	B-29, 458/2/48-A Makkar colony st.no.4 Sua road Giaspura	Yes
94	Pal Vakas Industries (98889029000)	190478	B-29, 458/2C/7A Makkar colony st.no.4 Sua road Giaspura	Yes
95	OP tools Industries GTB nagar	244930	B-29, 458/2L/8/1 Makkar colony st.no.4 Sua road Giaspura	Yes
96	Harjot Auto industries	256195	B-29, 458/2L/7A Makkar colony st.no.4 Sua road Giaspura	Yes
97	Kartar Hydrolic Inds. Unit-I	296195	B-29, 458/2L/7 Makkar colony st.no.4 Sua road Giaspura	Yes
98	Kartar Hydrolic Inds. Unit-II	296195	B-29, Makkar colony st.no.4 Sua road Giaspura	Yes
99	Jagannath Inds.	264200	B-29, 458/2-3/8 Makkar colony st.no.4 Sua road Giaspura	Yes
100	Daisy Inds. 9876070819	267826	B-29, 458/4/96 Makkar colony st.no.4 Sua road Giaspura	Yes
101	Manan inds.(9876128899)	327682	B-29, 458/4/97 Makkar colony st.no.4 Sua road Giaspura	Yes

102	RKD Inds.	282898	B-29, 458/4/97/B Makkar colony st no.4 Sua road Giaspura	Yes
103	JMD Wood works (9872950670)	266254	B-29, 458/2/3/1A Makkar colony st no.5 Sua road Giaspura	Yes
104	MS Industries 9876204111	224426	B-29, 458/2/4/5 Makkar colony st.no.5 Sua road Giaspura	Yes
105	Mithabel Industries (9888293882)	236013	B-29, Makkar colony st.no.5 Sua road Giaspura	Yes
106	Bariston Auto mds.	282397	B-29, Makkar colony st no.5 Sua road Giaspura	Yes
107	RP Enterprises 6239566860	20295	B-29, 458/2-2/4/5A Makkar colony st.no.5 Sua road Giaspura	Yes
108	KS Engineers	4089	B-29, 458/2-2/4/5 Makkar colony st no.5 Sua road Giaspura	Yes
109	R S Chemical and Inds.	258930	9316701304	Yes
110	Star Inds.	258019	9915621930	Yes
111	Mahadev Inds.	Not Passed	Makkar colony st.no.5 Sua road Giaspura	Yes
112	Singh I spellor Inds.	234359	9813049852	Yes
113	RR Enterprises 9888638786, 9888463292	249369	B-29, 458/4/6 st.no.5 Mian Sua road Giaspura	Yes
114	Anmol Enterprises 7355331901	258019	Makkar colony st.no.5 Sua road Giaspura	Yes
115	MS Gura Nanak Enterprises	Closed	Sua road Inds. Area-C Giaspura	Connection Disconnected
116	Kochar Bikes Industry	Not Passed	Makkar colony st no.5 Sua road Giaspura	Connection Not Passed
117	Kochar Engineer	Not Passed	Makkar colony st.no.5 Sua road Giaspura	Connection Not Passed

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ANNEXURE - B.

LUDHIANA GAS LEAK INVESTIGATION REPORT

ਪੰਜਾਬ ਵਾਟਰ ਸਪਲਾਈ ਅਤੇ ਸੀਵਰੇਜ ਮੰਡਲ, ਲੁਧਿਆਣਾ

cepwssdlyn2ldh@gmail.com

ਸੇਵਾ ਵਿਖੇ

ਕਾਰਜਕਾਰੀ ਇੰਜੀਨੀਅਰ,
ਜੇਨ-ਸੀ, ਓਪੇਡਾਐਮ ਸੇਲ,
ਨਗਰ ਨਿਗਮ, ਲੁਧਿਆਣਾ।

ਨੰਬਰ: 7/02

ਮਿਤੀ: 22-12-2023

ਵਿਸ਼ਾ :- NGT Matter in Original Application No. 327 of 2023; New Item published in India Today dated 30.04.2023 titled "3 minors among 11 dead in Ludhiana Gas Leak, Punjab Govt. announces Rs. 2 Lakh ex-gratia.

ਹਵਾਲਾ :- ਆਪ ਜੀ ਦੇ ਦਫਤਰ ਦਾ ਪੱਤਰ ਨੰ.231/XEN-C/O&M ਮਿਤੀ 20-12-2023.

ਉਪਰੋਕਤ ਵਿਖੇ ਸਬੰਧੀ ਹਵਾਲੇ ਅਧੀਨ ਪੱਤਰ ਨਾਲ ਆਪ ਜੀ ਦੇ ਵੱਲੋਂ ਭੇਜੇ ਗਏ ਨੱਥੀ ਪੱਤਰ ਦੇ ਲੜੀ ਨੰ. 5 ਅਤੇ 6 ਦੇ ਸਬੰਧੀ ਡਿਟੇਲ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਹੈ :-

Sr No.	Description	Area and Population as per Design Statement	Actual discharge as per Design Statement	Design discharge as per Design Statement	Remarks
1.(a) & (b)	i) N/10/1 to N/1 (30" i/d)	120 Acre @150 person per acre =18000 person	3.56 Cusecs	7.02 Cusecs	
	ii) N/22 to N/10/8 (30" i/d)	116.90 Acre @150 person per acre =17535 person	2.84 Cusecs	7.02 Cusecs	
2.(c)	Year of Commissioning is 2002-2003.				

ਇਸ ਤੋਂ ਇਲਾਵਾ ਬੇਨਤੀ ਸਹਿਤ ਲਿਖਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਲੜੀ ਨੰ. 5 ਦੇ (ਪਾਰਟ d, e) ਅਤੇ ਲੜੀ ਨੰ. 6 ਦੀ ਕਾਰਵਾਈ ਆਪ ਦੇ ਆਪਣੇ ਪੱਧਰ ਤੇ ਕੀਤੀ ਜਾਣੀ ਹੈ ਜੋ। ਇੱਥੇ ਆਪ ਜੀ ਨੂੰ ਇਹ ਵੀ ਸੂਚਿਤ ਕੀਤਾ ਜਾਂਦਾ ਹੈ ਕਿ ਸਬੰਧਤ ਏਰੀਏ ਦੀ ਮੰਗੀ ਗਈ ਅਪਰੂਵਡ ਡਿਜ਼ਾਇਨ ਸਟੇਟਮੈਂਟ ਸਮੇਤ ਡਰਾਇੰਗ ਅਤੇ ਲੈਵਲਾਂ ਸਬੰਧੀ ਪ੍ਰਫੇਰਮਾ ਟਾਈਪ ਕਰਵਾ ਕੇ ਪਹਿਲਾਂ ਹੀ ਇਸ ਦਫਤਰ ਦੇ ਪੱਤਰ ਨੰ. 2852 ਮਿਤੀ 18.05.2023 ਨਾਲ ਆਪ ਜੀ ਦੇ ਦਫਤਰ ਨੂੰ ਭੇਜਿਆ ਜਾ ਚੁੱਕਾ ਹੈ ਜੀ।

ਇਹ ਆਪ ਦੀ ਸੂਚਨਾ ਅਤੇ ਅਗਲੀ ਕਾਰਵਾਈ ਹਿੱਤ ਹੈ ਜੀ।


 ਕਾਰਜਕਾਰੀ ਇੰਜੀਨੀਅਰ
 ਪੰਜਾਬ ਵ/ਸ ਅਤੇ ਸੀਵਰੇਜ ਮੰਡਲ,
 ਲੁਧਿਆਣਾ
 22.12.2023

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ANNEXURE - C

Subject:- NGT matter in Original Application No. 327 of 2023. News item Published in India Today dated 30.04.2023 titled 3 minors among 11 dead in Ludhiana Gas leak Punjab Govt Announce Rs 2 lakh EX-Gratia-reg.

Ref:- Central Pollution Control Board Regional Directorate, Chandigarh
Letter No RD-CHD/Tech/Co-ordination/228-A/220

Kindly Refer to above mentioned letter, As desired at Para No 06,
Site plans with Pictorial diagram of Incident Houses (Goyal Cold Drinks and Aarti Clinic) with their dimensions are attached herewith.


Assistant Town Planner
Zone- C, Municipal Corporation
Ludhiana.

29/12/23

Subject:- Report Regarding Buildings of Goyal Confectionery / Goyal Cold Drinks and Aarti Clinic Sua Road Giaspura Ludhiana.

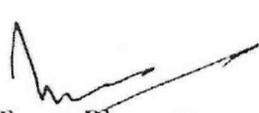
In this regard, it is submitted that site of buildings of Goyal Confectionery / Goyal Cold Drinks and Aarti Clinic Sua Road Giaspura Ludhiana checked and it was also enquired from residents of the area and report is as under:-

1) As regards Building of Goyal Confectionery / Goyal Cold Drinks Sua Road there is shop on ground floor and owners residence at first floor. As informed by residents of the area, the construction of the building was done by the owners in the year 1993.

2) Regarding Aarti Clinic building Sua Road Giaspura, there is Clinic at ground floor and residence at first floor. As reported by the residents of the area, construction of the building was done by the owner during the year 1997.

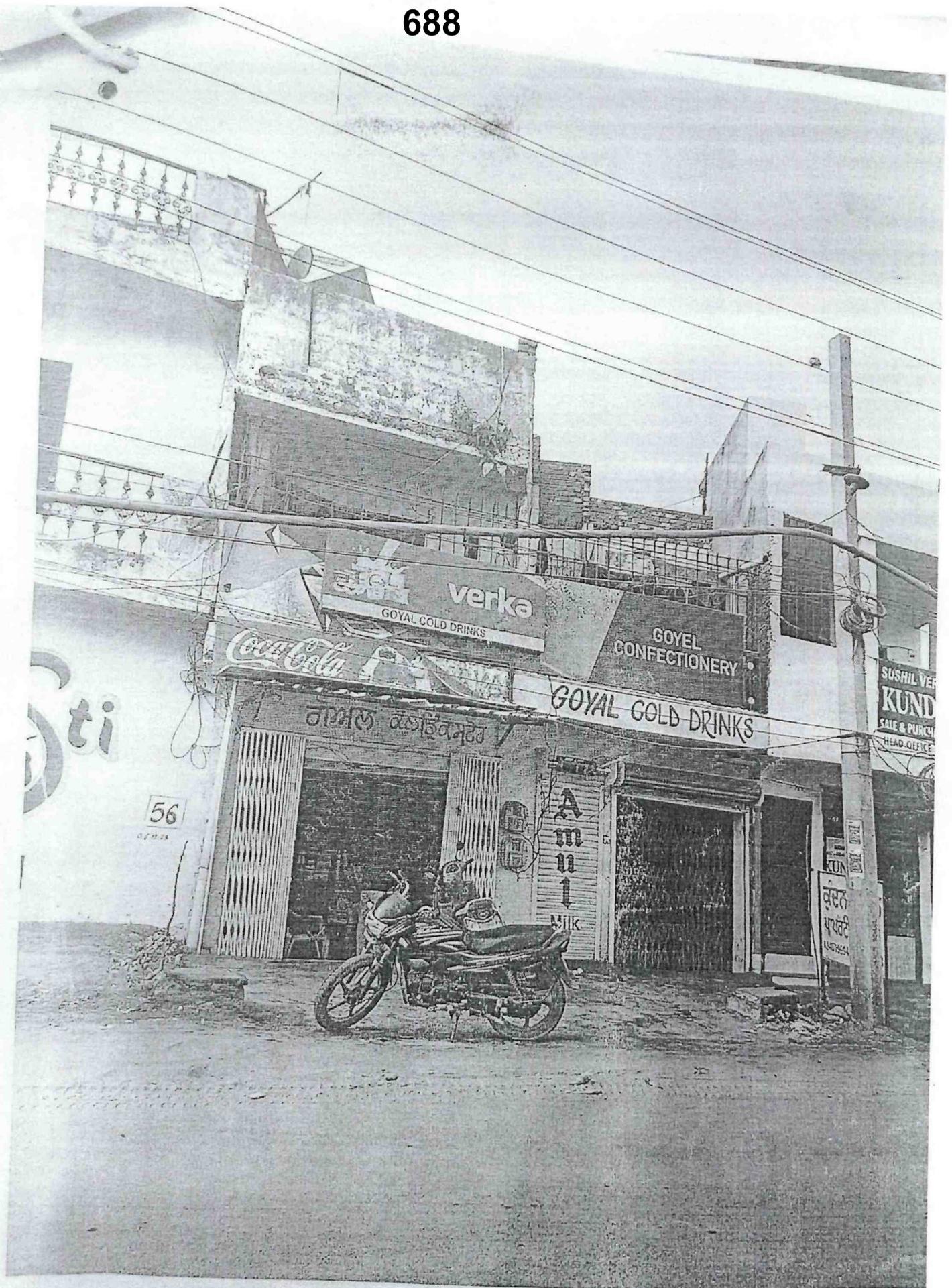
It is also submitted that as per records of Zone-C, Building Branch the owners of the above buildings neither get the plans sanctioned at the time of constructions nor got their buildings regularised at the time of regularization policy of the State Govt.

Report Submitted Please.

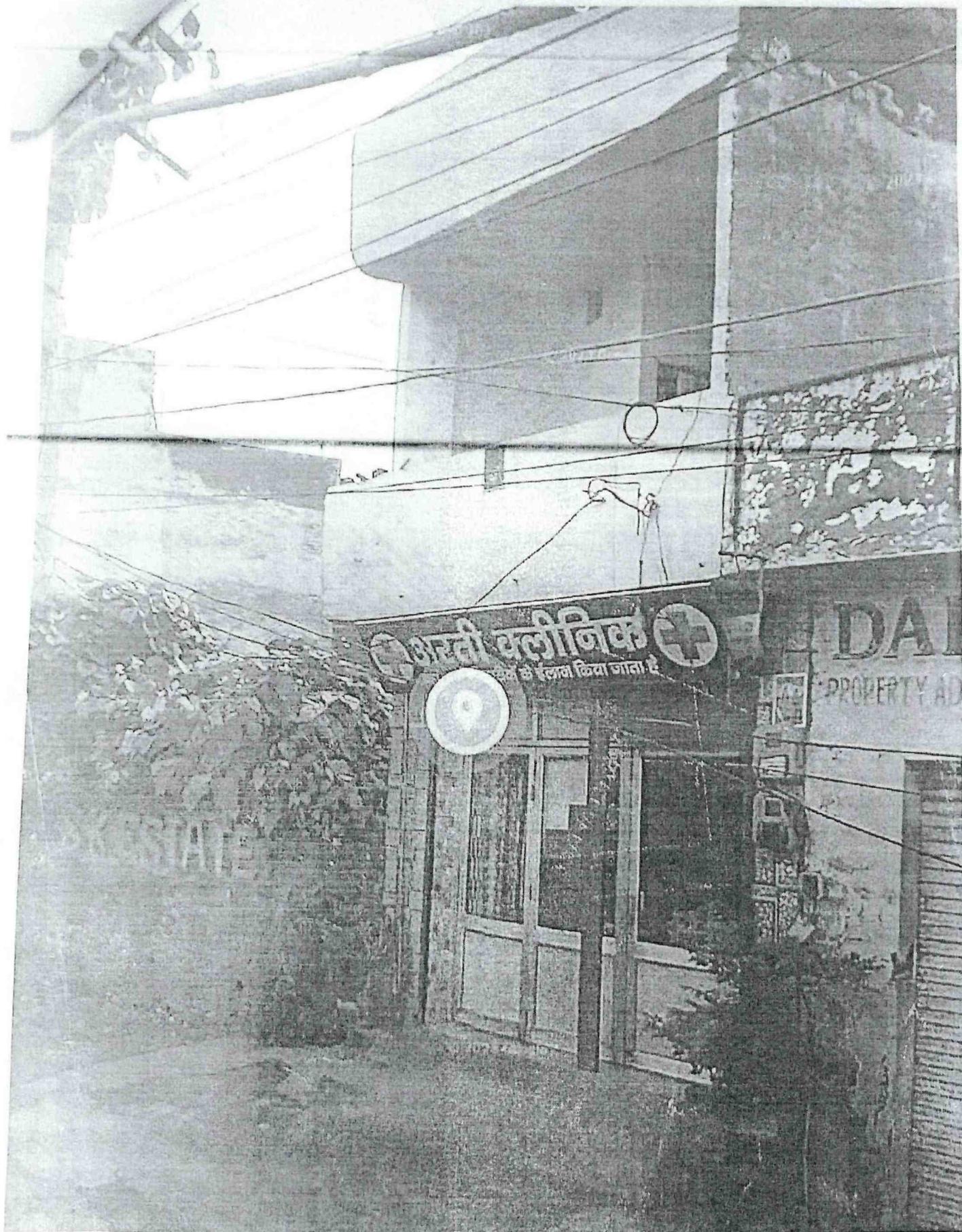

Assistant Town Planner
Zone- C, Municipal Corporation
Ludhiana.

29.12.23

Building Inspector
Zone- C, Municipal Corporation
Ludhiana.



N.G.T. Road. Road. Road.



Detail of the industries located in the catchment of the affected sewer line from tragedy point upto Aashirwad Kanda

S.No.	Name and address of the industries	Status of consent to operate (valid upto)	Mode of disposal of trade effluent	Agreement made with CETP Operator	Approx. quantity of effluent generated per day as per consent to operate	Copy of manifest for last one year
1.	D.K.T. company, B-29, 536/25/C/1 Sua road ind. Area- C Giaspura, Ludhiana	Yes valid upto 30.06.2028	Lifted to CETP operator / reprocessors	Agreement made with Re-processor M/s JBR Tech Pvt Ltd, , Ludhiana	0.1 KLD	Yes enclosed
2.	Malwa Auto Enterprises, B-29, 536/25/2-C Sua road ind. Area- C Giaspura, Ludhiana.	Yes valid upto 30.06.2024	Lifted to CETP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.08 KLD	Yes enclosed
3.	Shivam Auto Industries, B-29, 536/25/3-A Sua road ind. Area- C Giaspura, Ludhiana	Yes valid upto 30.06.2024	Lifted to CETP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.016 KLD	Yes enclosed
4.	Pullman Sales corporation, B-29, 536/25/A/2 Sua road ind. Area- C Giaspura, Ludhiana	Yes valid upto 30.6.2028	Lifted to CETP operator / reprocessors	Agreement made with Re-processor:- M/s Krishna Agro Chem., Ludhiana	0.4 KLD	Yes enclosed
5.	Guru Nanak Enterprises, Plot No. 66/12, Industrial Area-C, Giaspura, Ludhiana	-	Lifted to CETP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	-	Unit closed

6.	King Industry, B-29/536/25/3A/2, Sua Road, Indl Area-C, Ludhiana	Yes valid upto 30.06.2027	Lifted to CETTP operator / reprocessors	Agreement made with Reprocessor-M/s Charanjit and Co. Technology LLP, VPO Paddi, Sahnewal-Dehlon Road, Ludhiana	0.16 KLD	Yes enclosed
7.	Davinder Cycle Industries, B-xxix,536/25/3, Hadbast No-241, Dhandari Kalan, Indl.area-c,sua Road, Ludhiana	Yes valid upto 30.6.2026	Lifted to CETTP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.2 KLD	Yes enclosed
8.	Shri Krishna steel Industries, B-29, 536/25/1-4 Sua road ind. Area- C Giaspura, Ludhiana	Yes valid upto 30.6.2028	Lifted to CETTP operator / reprocessors	Agreement made with re-processor:- M/S JBR Technologies Pvt Ltd.	0.16 KLD	Yes enclosed
9.	Maharaja Enternational-1, B-29, 536/26/3 Sua road ind. Area-C, Nanaksar Kanda Giaspura, Ludhiana.	Yes valid upto 30.6.2027	Lifted to CETTP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	1 KLD	Yes enclosed
10.	Maharaja Enternational-1I, B-29, 536/2B/3A Sua road ind. Area- C, Nanaksar Kanda Giaspura, Ludhiana.	Yes valid upto 30.06.2028	Lifted to CETTP operator / reprocessors	Agreement made with Re-processor:- M/s JBR Tech Ltd Unit-2, Vill Mangarh, Kohara, Ludhiana	0.08 KLD	Yes enclosed
11.	Maharaja Enternational-1II, B-29, Sua road ind. Area-C Nanaksar Kanda, Giaspura, Ludhiana.	Yes valid upto 30.06.2024	Lifted to CETTP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.4 KLD	Yes enclosed

12.	Sidhana wire industry, B-29, Sua road ind. Area-C Ashirbad Kanda, Giaspura, Ludhiana.	Yes valid upto 30.06.2026	Lifted to CETP operator / reproprocessors	Agreement made with CETP Operator :- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.24 KLD	Yes enclosed
13.	Indian Bicycles, 536/25B/1, Industrial Area-C, Sua Road, Ludhiana	Yes valid upto 30.06.2025	Lifted to CETP operator / reproprocessors	Agreement made with CETP Operator :- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.28 KLD	Yes enclosed
14.	Anmol Enterprises, Giaspura, Sua Road, Ludhiana	Yes valid upto 30.06.2028	Lifted to CETP operator / reproprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.06 KLD	Yes enclosed
15.	RP Enterprises, B-29, 458/2-2/4/5A Makkar colony st.no.5 Sua road, Giaspura, Ludhiana	Yes valid upto 14.09.2023	Lifted to CETP operator / reproprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.16 KLD	Yes enclosed

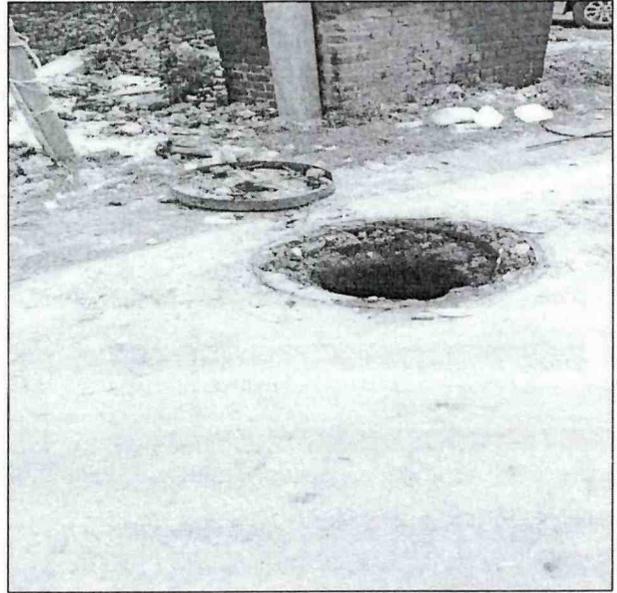
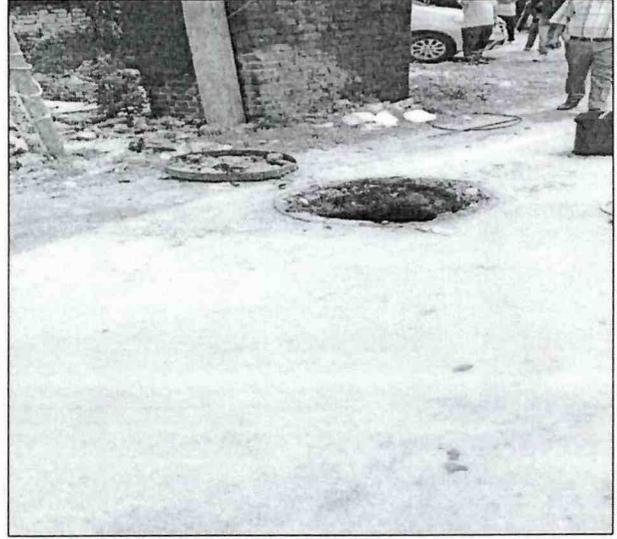
Details of industries surveyed not connected with the catchment area of affected area (either located down stream or upstream beyond Aashirwad Kanda where in sewer line flows in opposite direction hence not located in the catchment of the affected area)

S.No.	Name and address of the industries	Status of consent to operate (valid upto)	Mode of disposal of trade effluent	Agreement made with CETP Operator	Approx. quantity of effluent generated per day as per consent to operate
1.	A.T Wires, B/s Sitara Cinema, Sua Road, Ludhiana	30.06.2023 (Revoked)	Lifted to CETP operator / reprocessors	Agreement made with Re-processor:-M/s JBR Tech Ltd Unit-2, Vill Mangarh, Kohara, Ludhiana	0.1 KLD
2.	Bansal Manufacturing Company, 536/35/1/4, Giaspura, Sua Road, Ludhiana	30.06.2025 (revoked)	Lifted to CETP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.1 KLD
3.	Trimurti Exports, Industrial Area-C, Giaspura, Ludhiana	30.06.2020	Lifted to CETP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Tech Pvt Ltd, Phase-VIII, Focal Point, Ludhiana	0.06 KLD
4.	Pal Enterprises, Industrial Area -C, Sua Road, Ludhiana	-	Lifted to CETP operator / reprocessors	Agreement made with Reprocessor-M/s Charanjit and Co. Technology LLP, VPO Paddi, Sahnawal-Dehlon Road, Ludhiana	Directions issued for closure
5.	JMD Happy Ispat, B/s Sitara Cinema, Sua Road, Ludhiana	Yes valid upto 30.06.2028	Lifted to CETP operator / reprocessors	Agreement made with CETP Operator- M/s JBR Technologies Unit-1, Phase-VIII, Focal Point, Ludhiana	0.04 KLD
6.	Aggarwal Wire & Steel Products, Shanti Nagar, Sua Road, Ludhiana	30.06.2028	Lifted to CETP operator / reprocessors	Agreement made with Re-processor-M/s Krishna Agro Chem, Ludhiana	0.4 KLD
7.	Munna Zinc Plating, St. No. 4, Guru Amardass Colony, Giaspura, Ludhiana			Directions issued for closure	

Details of lifting of effluent from the industries situated in adjoining of Sua Road, Giaspura as per data received from CETP Operator M/s JBR Technology Pvt. Ltd. (vide email dated 22.12.2023), and authorized re-processors i.e. M/s Krishna Agro chem and M/s Charanjit & Company						
Sr No.	Name of the industries	Address	Date of Agreement	Agreement with	Commitment quantity as per Agreement (in Ltrs/month)	Lifting quantity from 01.04.2022-30.4.2023 (in ltrs)
1	D.K.T. company	B-29, 536/25/C/1 Sua road ind. Area-C Giaspura	21-10-2013	M/s JBR Technology Pvt. Ltd	2500	27500
2	Indian Bicycles,	536/25B/1, Industrial Area-C, Sua Road, Ludhiana	03-02-2014	M/s JBR Technology Pvt. Ltd	7000	76300
3	Shivam Auto Industries	B-29, 536/25/3-A Sua road ind. Area-C Giaspura	24-07-2014	M/s JBR Technology Pvt. Ltd	5000	53300
4	Pullman Sales corporation	B-29, 536/25/A/2 Sua road ind. Area-C Giaspura	25-06-2018	M/s Krishna Agro chem	4000	48000
5	King Industry	B-29/536/25/3A/2, Sua Road, Indl Area-C, Ludhiana	27-07-2018	M/s JBR Technology Pvt. Ltd	1500	21800
6	Davinder Cycle Industries	B-xxix.536/25/3, Hadbast No-241, Dhandari Kalan, Indl.area-c.sua Road, Ludhiana	07-08-2007	M/s JBR Technology Pvt. Ltd	3000	30400
7	Shri Krishna steel Industries	B-29, 536/26-B Sua road ind. Area-C LUDHIANA	04-02-2014	M/s JBR Technology Pvt. Ltd	4000	53000
8	Maharaja Enternational-I	B-29, 536/26/3 Sua road ind. Area-C Nanaksar Kanda Giaspura	08-07-2007	M/s JBR Technology Pvt. Ltd	25000	229300
9	Maharaja Enternational-II	B-29, 536/2B/3A Sua road ind. Area-C Nanaksar Kanda Giaspura	25-01-2014	M/s JBR Technology Pvt. Ltd	2000	19500

10	Maharaja Enternational-1111	B-29, Sua road ind. Area-C Nanaksar Kanda Giaspura	31-08-2016	M/s JBR Technology Pvt. Ltd	10000	90500
11	Sidhana wire industry	B-29, Sua road ind. Area-C Ashirbad Kanda Giaspura	03-12-2021	M/s JBR Technology Pvt. Ltd	6000	44500
12	Malwa Auto Enterprises	B-29, 536/25/2-C Sua road ind. Area-C Giaspura	02-05-2014	M/s JBR Technology Pvt. Ltd	2000	4000
13	Anmol Enterprises,	Giaspura, Sua Road, Ludhiana	17-10-2011	M/s JBR Technology Pvt. Ltd	6000	60000
14	RP Enterprises	B-29, 458/2-2/4/5A Makkar colony st.no.5 Sua road Giaspura	14-07-2018	M/s JBR Technology Pvt. Ltd	4000	36500

695



Photographs of the manhole on the day of incident i.e., 30-04-2023

To,

Environmental Engineer,
Regional Office-2,
Ludhiana.

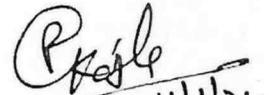
No. 295/KEN-C/OEMDated 11-1-24

Subject:- NGT matter in Original Application no.327 of 2023 News Item Published in India Today Dated 30.4.2023 titled "3 minors among 11 dead in Ludhiana Gas Leak, Punjab Govt. announces Rs. 2 lakh Ex-Gratia.

Ref.:- Email received from CPCB dated 08.01.2024 and letter no. 26 dated 08.01.2024

In reference to the letter No. 26 Date 08.01.2024 of PPCB point wise reply is stated as under:-

1. The Engg. Drawing elevation/slope of sewer line of the affected area is provided by Punjab water supply of Sewerage board and is attached with as Annexure-A.
2. The drawings depicting the elevation of haudi's of aarti clinic and goyal store w.r.t. to main sewer is attached as Annexure-B.
3. It is stated that data of rainfall is not available with this Office.
4. In this area there is 100% sewer connectivity and w.r.t. to details of septic tanks in downstream area it is stated that no record of septic tanks in maintained by this Office.



Executive Engineer,
Zone-C, O&M cell,

Municipal Corporation Ludhiana.



Visit to the University of Michigan

Detail of State of Michigan
 Population
 1950
 1955
 1960
 1965
 1970
 1975
 1980
 1985
 1990
 1995
 2000
 2005
 2010
 2015
 2020

699

Year	Area	Population	Area	Population	Area	Population	Area	Population	Area	Population	Area	Population	Area	Population	Area	Population	Area	Population	Area	Population	
1950	11.50	1650	6.085	0.25	11.42	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	
1955	4.60	630	2.036	0.11	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1960	5.90	825	0.045	0.13	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1965	6.05	908	0.048	0.14	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1970	6.25	413	0.082	0.07	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1975	11.10	1655	0.083	0.23	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1980	14.75	2213	0.177	0.35	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1985	3.20	460	0.025	0.09	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1990	16.05	2708	0.143	0.44	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
1995	0.50	15	0.004	0.00	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88
2000	18.65	2998	0.147	0.64	170	1.725	2.507/1.44	5.20	825.40	825.91	13.22	15.79	16.51	1.00	17.88	1.00	17.88	1.00	17.88	1.00	17.88

41	4/15/1-4/14	18.40	2760	0.15	0.45	10	1/205	2.50/0.65	2.13	825.05	821.97	811.3	6.20	7.05	6.52
42	4/15-1/16	5.30	795	0.04	0.12	8	1/225	2.50/0.44	3.11	823.85	823.51	814.5	5.09	7.61	6.31
43	4/14-4/15	6.40	860	0.05	0.15	10	1/305	2.50/0.50	3.28	825.75	825.6	815	4.00	7.15	5.57
44	4/15-4/16	15.40	1660	0.10	0.30	12	1/390	2.50/0.74	1.02	825.60	824.4	813	7.21	7.15	7.17
45	4/15/1-4/16	9.00	1590	0.07	0.21	10	1/305	2.50/0.65	2.69	824.70	824.1	814	4.56	7.05	5.81
46	4/15-4/15	22.00	3390	0.17	0.51	12	1/390	2.50/0.98	0.38	824.59	822	817	7.13	5.31	6.22
47	4/15/1-4/15	24.5	415	0.02	0.06	8	1/225	2.50/0.44	2.44	825.50	822	815	4.07	5.31	4.69
48	4/15-4/16	26.60	3980	0.21	0.63	16	1/570	2.50/1.14	0.89	822.30	821	812	5.48	6.31	5.90
49	4/15-4/16	20.70	3105	0.16	0.48	12	1/390	2.50/0.56	2.31	824.60	82	814	6.18	6.16	5.16
50	4/15-4/15	4.55	655	0.03	0.09	8	1/225	2.50/0.44	3.11	824.50	82	811	5.12	5.98	5.55
51	4/15-4/16	36.95	5945	0.35	1.01	16	1/570	2.50/1.14	1.84	822.25	82	812	6.31	5.50	7.91
52	4/15-4/16	36.95	5945	0.35	1.01	16	1/570	2.50/1.14	1.84	822.25	82	812	6.31	5.50	7.91
53	4/15-4/16	36.95	5945	0.35	1.01	16	1/570	2.50/1.14	1.84	822.25	82	812	6.31	5.50	7.91

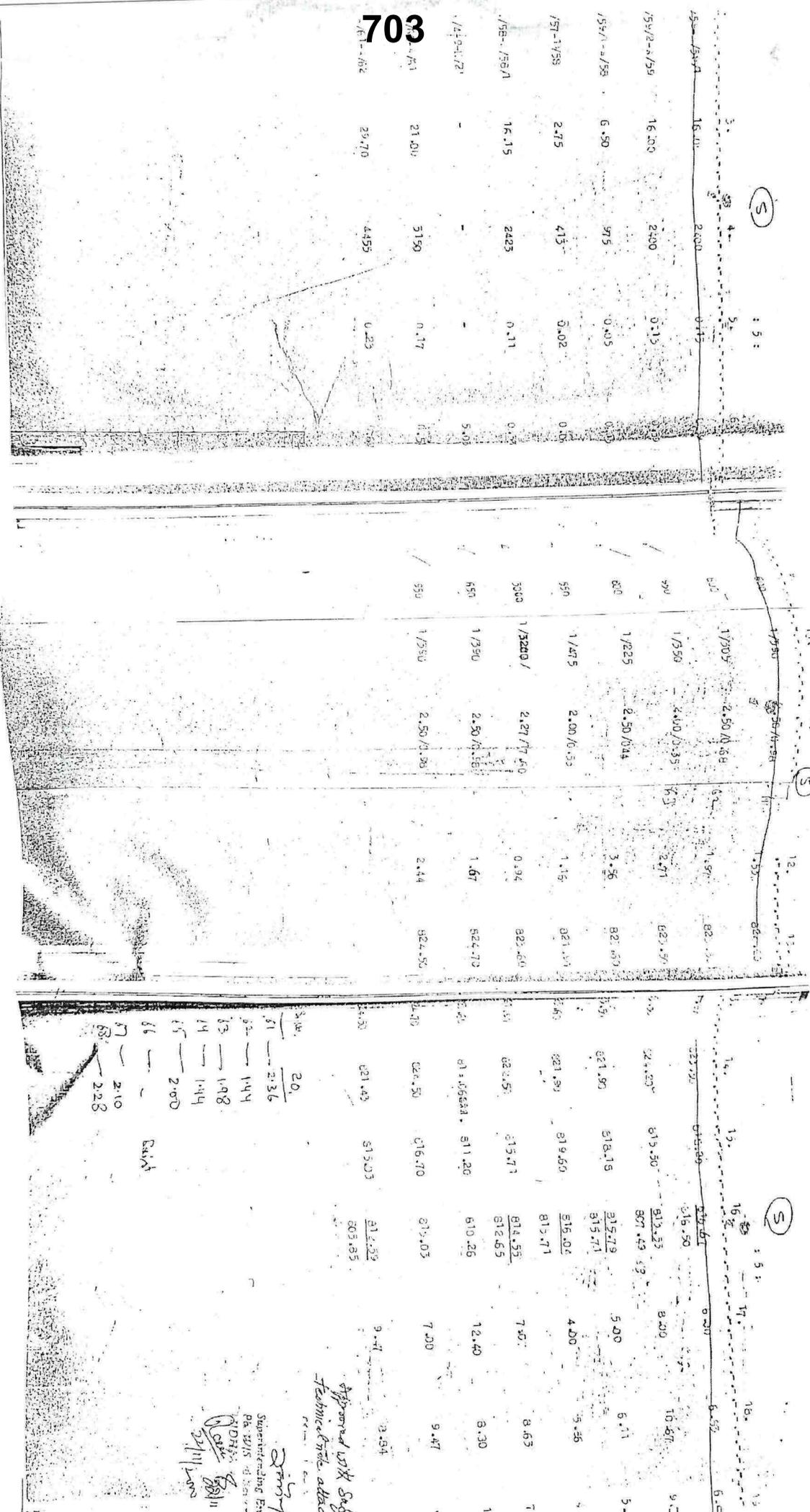
N 1613 - 11/1/9

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4

4

703



20	210	228
236	194	198
194	194	200
200		

Curv

Approved by: *[Signature]*
 Technical Director
 Approved by: *[Signature]*
 Superintendent
 P.O. Box 1115
 2/11/11

704

22/10/350
(25-23)



ANNEXURE - B

706

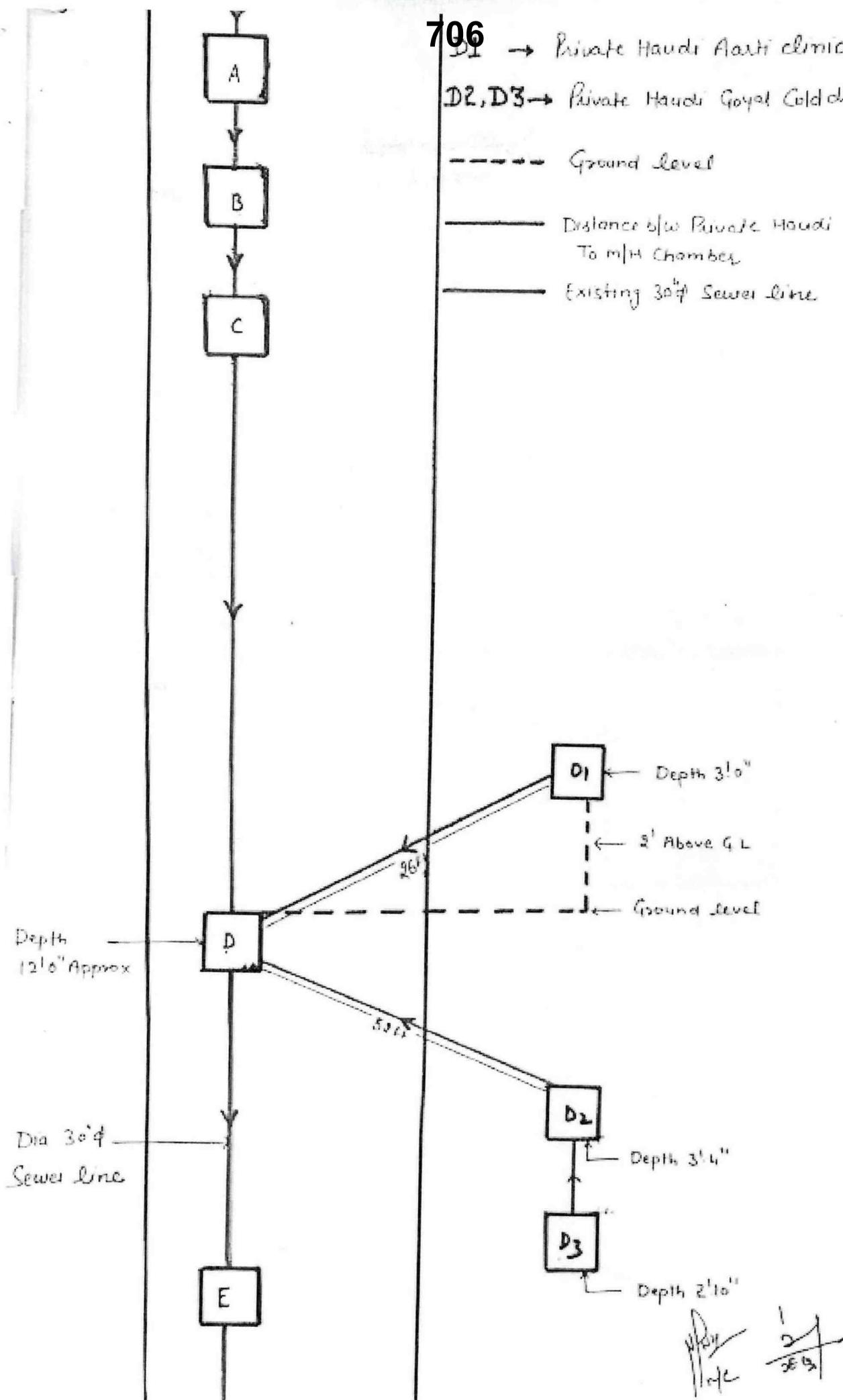
D1 → Private Haudi Aarti clinic

D2, D3 → Private Haudi Goyal Cold drinks

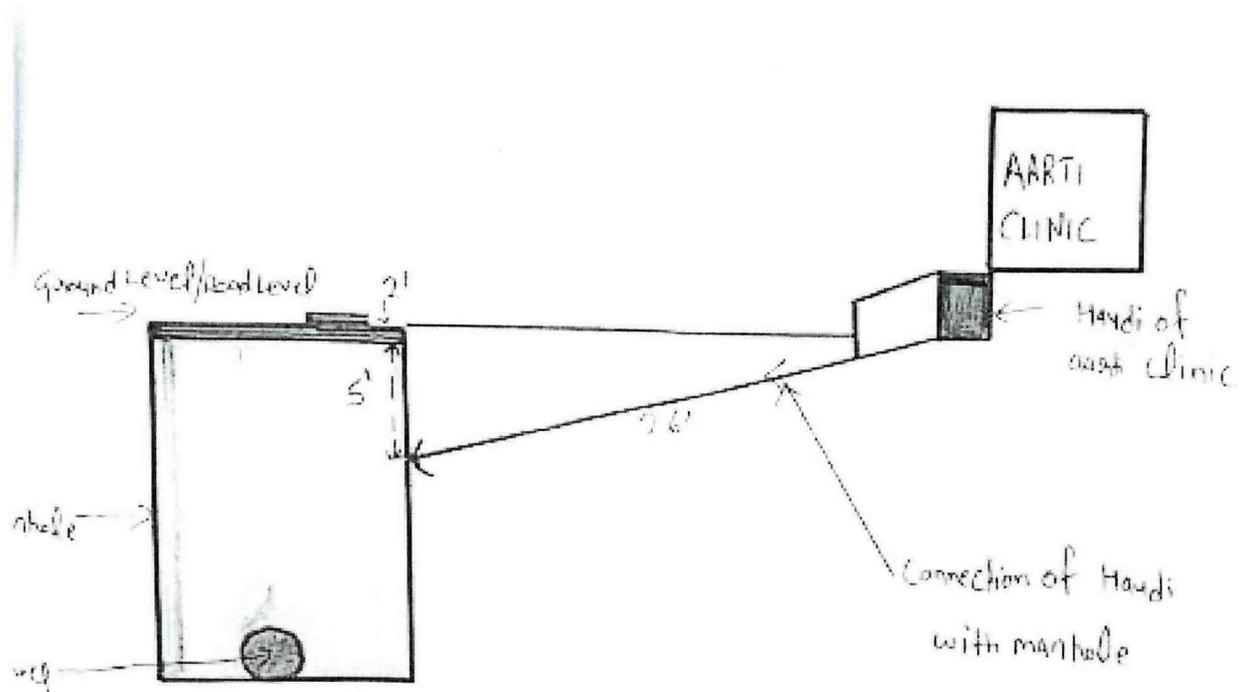
----- Ground level

———— Distance b/w Private Haudi To m/H Chamber

———— Existing 30" Sewer line



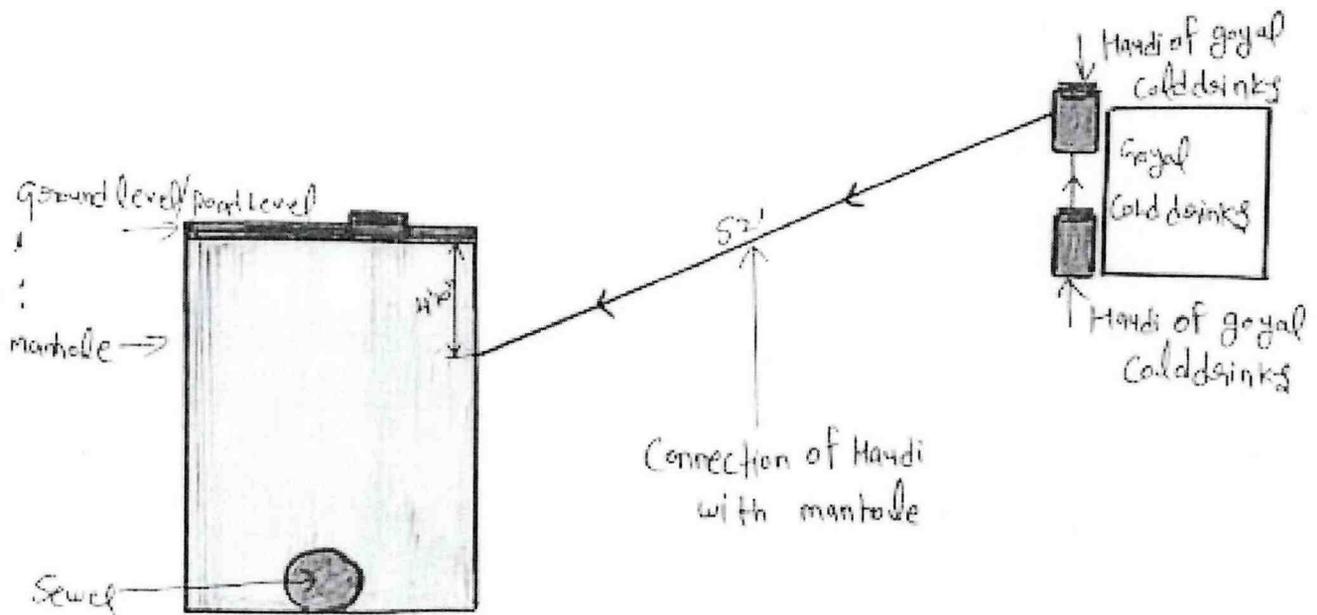
ELEVATION OF HAUDI OF AARTI CLINIC



He

1
2
30/5

ELEVATION OF HAUDI OF GOYAL COLDDRINKS ⁷⁰⁸



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1
0
2/3