

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL, PRINCIPAL BENCH,
NEW DELHI**

Original Application No. 676 of 2023

In Re: News Item Appearing in The Times of India dated 12.10.2023 entitled "Agriculture Runoff causing groundwater pollution in Punjab, making Drinking Water unsafe Reveals Study".

Short reply on behalf of respondent Punjab Pollution Control Board through Environmental Engineer, Regional Office-2, Ludhiana.

Respectfully Showeth

1. That briefly stated, the Hon'ble National Green Tribunal was pleased to take suo moto cognizance of a new item appearing in The Times of India dated 12.10.2023 titled "Agriculture Runoff causing groundwater pollution in Punjab, making Drinking Water unsafe Reveals Study". The news item was treated as Original Application no. 676 of 2023 and notices were issued by the Hon'ble National Green Tribunal to the Central Pollution Control Board; Punjab Pollution Control Board and the Indian Institute of Technology, Mandi, Himachal Pradesh for appearance before the Hon'ble Tribunal on 3.11.2023
2. That in the preliminary facts and circumstances of the case, it was submitted by the Board vide written reply dated 1.11.2023 that the ground water of the State of Punjab is regularly been monitored by the Department of Water Supply and Sanitation for the purpose of supplying drinking water to the people of the State. On the other hand, the data relating to the usage of ground water from deeper geological strata which is alleged to be used by the farmers may be available with the

Department of Agriculture and Farmer's Welfare, Punjab. Hence, the Department of Water Supply and Sanitation and the Department of Agriculture and Farmer's Welfare, Punjab are in a better position to explain the facts mentioned in the news item.

3. That the Hon'ble Tribunal was pleased to implead the following parties as respondents vide order dated 3.11.2023

- a) Central Pollution Control Board through its Member Secretary;
- b) Punjab Pollution Control Board through its Member Secretary;
- c) Indian Institute of Technology (IIT) Mandi; through its Director;
- d) Department of Water Supply and Sanitation, State of Punjab through its Administrative Head
- e) Department of Agriculture and Farmer's Welfare, State of Punjab through its Administrative Head;

4. That the Punjab Pollution Control Board was directed vide order dated 3.11.2023 to file report in response to the facts disclosed in the news item report, inter-alia, including the issue of heavy metals, radioactive substance, pesticides and chemicals pollutants found in the ground water of the concerned area in sample testing.

5. That in compliance to the order dated 3.11.2023, it is submitted that the Punjab Pollution Control Board (PPCB) has been carrying out monitoring at 43 groundwater locations under the National Water Monitoring Programme (NWMP) of the Central Pollution Control Board. These locations are subject to biannual monitoring, specifically in April and October. The details regarding the monitoring are mentioned herein below:

- i. Out of the 43 monitored locations, the sampling encompasses areas within the south-western region of Punjab, covering the districts of Fazilka, Sri Mukatsar Sahib, Mansa, Bathinda & Sangrur. The listed monitoring locations are as follows:

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- ii. The list of these monitoring locations is as under:-

Sr. no.	Name of locations	Name of District
1	HP petrol pump Approx. 200 mtr. from M/s HMEL Refinery	Bathinda
2	Gurukul college near ash dykes Guru Nanak Dev Thermal Plant, Bathinda	Bathinda
3	Petrol Pump near Guru Hargobind Thermal Plant, Lehra Mohabbat	Bathinda
4	Hand pump installed alongwith the link road meeting Muktsar Malout Road from Vill. Rahurialwali	Distt. Sri Muktsar Sahib
5	Hand pump in the premises of Cremation Ground of Village Ratoul Rohi near Malbros International (P) Ltd., Village Mansoorwal, Tehsil Zira, Distt. Ferozpur	Ferozpur

- iii. The analysis data from 2020 to 2022 for groundwater monitoring at the above sampling locations under the National Water Monitoring Programme is enclosed herewith as **Annexure-A**.
- iv. The comparison of the data against the drinking water standards as per IS: 10500 2012 (WHO Standards) has been carried out. Parameters beyond permissible and desirable limits are highlighted and compiled and are enclosed as **Annexure-B**.
- v. The scrutiny of the data confirms that none of the samples from the above mentioned locations breached the permissible limits set by the World Health Organization (WHO) for heavy metals and pesticides. However, certain parameters exceeding the permissible limits belong to anion and cation categories which are geogenic in nature.

- vi. It is relevant to mention here that the information regarding radioactive substances is not available in the laboratories of Punjab Pollution Control Board as such parameters of radioactive substance cannot be commented upon.
6. That the research paper of IIT Mandi has been examined and the observations of the Board are recorded herein below:
- a) The research paper is based on the data of 11 parameters viz pH, EC, Bicarbonate, chloride, Sulphate, Nitrate, Fluoride, Calcium, Magnesium, Sodium & potassium of 315 locations monitored by the Central Ground Water Board. Thus, the data used in the research paper does not have any reference to heavy metals, pesticides and radioactive substances in the ground water of Punjab.
 - b) As per the authors of the research paper, the Water Quality Index (WQI) data for the year 2000 has categorized 13.01% of sampling locations as very poor and 20% as unsuitable for drinking, whereas, the WQI data for the year 2020 categorized 6.35% of sampling locations as very poor and 12.38% as unsuitable for drinking.
 - c) The examination of the data presented by the authors of the research paper reveals that the percentage of locations categorized as very poor and unsuitable has actually decreased over the study period spanning into 20 years from the year 2000 upto the year 2020.
7. That it is pertinent to mention here that primarily the Central Ground Water Authority (CGWA) constituted by the Central Government in exercise of the powers conferred under the Environment (Protection) Act, 1986 is the statutory authority responsible for the regulation, control, management and development of ground water in the country and to issue necessary regulatory directions for the purpose. It is relevant to mention here that the drinking water supply arrangement in the State of

sd *By*

Punjab is being regulated and monitored by the Department of Punjab Water Supply and Sanitation Board (PWSSB).

8. That the reply of the Punjab Pollution Control Board is hereby submitted in compliance to order dated 3.11.2023 for kind perusal and consideration of the Hon'ble National Green Tribunal.

Date: 12/01/2024

Place: Ludhiana.


Environmental Engineer
Punjab Pollution Control Board
Regional Office-2
Ludhiana

Environmental Engineer
Punjab Pollution Control Board
Regional Office-II, Ludhiana

Monitoring Results of Ground Water Samples under NWMP for the month of April-May, 2020

Annexure-A

Sr. no.	Point of Collection	Date of collection/ receipt in lab	District	Depth in mts	Location Code	pH	Turb. NTU	Cond μ s/cm	COD mg/l	TSS mg/l	TDS mg/l	TFS mg/l	T.H as CaCO ₃ mg/l	Ca mg/l	Mg mg/l	F mg/l	NO ₃ as N mg/l	Cl mg/l	SO ₄ mg/l	TAlk as CaCO ₃ mg/l	Na mg/l	K mg/l	SAR	% Na	B mg/l
1	HP in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	19/5/20 20/5/20	Faridkot	60	4151	8.1	BDL	2170	BDL	BDL	1518	1396	108	14	18	0.39	1.8	149	30	602	817	8	47.1	95	BDL
2	adjoining HP- Petrol Pump, at a distance of Approx at 200 from M/s HMEI Refinery	7/5/20 8/5/20	Bathinda	70	4148	7.2	BDL	4040	BDL	BDL	2838	2596	894	218	85	1.62	80.6	429	410	648	893	25	15.2	72	BDL
3	Gurukul College near shiv Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	7/5/20 8/5/20	Bathinda	100	4147	7.9	BDL	2782	BDL	BDL	1954	1720	107	29	8	1.56	12.4	163	92	374	955	8	45.7	95	0.09
4	Petrol pump near M's Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda	7/5/20 8/5/20	Bathinda	60	4149	7.3	BDL	1243	BDL	BDL	874	760	249	24	46	6.44	4.2	71	54	324	422	15	16.9	84	0.2
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh	1/6/20 2/6/20	Bathinda	40	4150	7	BDL	1742	BDL	BDL	1087	960	473	63	77	0.44	4.8	194	246	396	134	4	3.7	52	0.09
	Permissible limits					6.5-8.5	5	-	-	-	2000	-	-	200	100	1.5	10.2	1000	400	600	-	-	-	-	-

- Note: 1) BOD, T.Coli, F.Coli, TKN, Amm.N, P.alk and PO₄ were BDL in all the samples
 2) Pesticides i.e. Alpha HCH, Beta HCH, Gamma HCH, Anilophos, Chloropyrifos, 4,4' DDT, Endosulphan-1, Endosulphan-2, Dieldrin, Aldrin & Malathion were BDL.
 3) BDL means Below method Detection Limit.

Monitoring Results of Ground Water Samples under NWMP for month of April-May, 2020

Sr. no.	Point of Collection	Date of collection/ receipt in lab	Lab Sample No.	Sample Collected By RO	Depth in mts	Location Code	Fe mg/l	Zn mg/l	Cu mg/l	Ni mg/l	T. Cr mg/l	Pb mg/l	Cd mg/l	As mg/l	Hg mg/l
1	HP in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi- Zira Road Zira	19/5/20 20/5/20	GW 453	Faridkot	60	4151	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2	adjoining HP- Petrol Pump, at a distance of Approx at 200 from M/s HMEI Refinery	7/5/20 8/5/20	GW 418	Bathinda	70	4148	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda.	7/5/20 8/5/20	GW419	Bathinda	100	4147	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4	Petrol pump near M's Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda.	7/5/20 8/5/20	GW 420	Bathinda	60	4149	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh	1/6/20 2/6/20	GW 475	Bathinda	40	4150	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL means Below Method Detection Limit



Monitoring Results of Ground Water Samples under NWMP for the month of October-November, 2020

Sr. no.	Point of Collection	Date of collection/receipt in lab	Lab Sample No.	Sample Collected By RO	Depth in mts	Location Code	pH	Turb. NTU	Cond µs/cm	COD mg/l	TSS mg/l	TDS mg/l	TFS mg/l	T.H as CaCO ₃ mg/l	Ca mg/l	Mg mg/l	F mg/l	NO ₃ as N mg/l	Cl mg/l	SO ₄ mg/l	TAlk as CaCO ₃ mg/l	Na mg/l	K mg/l	PO ₄ mg/l	SAR	% Na	B mg/l	
1	H.P in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	9/10/2020 9/10/2020	GW 583	Faridkot	60	4151	7.6	BDL	1060	BDL	BDL	680	611	51	12	5	0.34	2.1	104	30	256	301	3	BDL	18.4	91	0.09	
2	adjoining H.P- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	3/11/2020 4/11/2020	GW 631	Bathinda	70	4148	7.3	BDL	4830	BDL	BDL	2882	2699	1171	318	91	1.52	62.4	442	424	740	941	23	BDL	12.0	62	BDL	
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	4/11/2020 4/11/2020	GW 635	Bathinda	100	4147	8.1	BDL	2606	BDL	BDL	1610	1491	101	12	17	1.6	10.8	194	140	396	848	24	BDL	36.9	99	BDL	
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	4/11/2020 4/11/2020	GW 636	Bathinda	60	4149	7.5	BDL	1223	BDL	BDL	796	694	250	32	41	4.2	6.9	55	60	240	340	16	BDL	9.4	79	0.10	
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahunanwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh	3/11/2020 4/11/2020	GW 634	Bathinda	40	4150	7.3	BDL	1684	BDL	BDL	1063	964	432	87	52	0.42	4.4	124	138	278	398	10	BDL	8.3	65	BDL	
	Permissible limits	-	-	-	-	-	6.5-	5	-	-	-	2000	-	-	200	100	1.5	10.2	1000	400	600	-	-	-	-	-	-	-

- Note: 1) BOD, T.Coli, F.Coli, TKN, Amm-N, P,alk and PO₄ were BDL in all the samples
 2) Pesticides i.e. Alpha HCH, Beta HCH, Gamma HCH, Anilophos, Chloropyrifos, 4,4' DDT, Endosulphan-1, Endosulphan-2, Dieldrin, Aldrin & Malathian Were BDL.
 3) BDL means below method Detection Limit.

Monitoring Results of Ground Water Samples under NWMP for month of October-November, 2020

Sr. no.	Point of Collection	Date of collection/receipt in lab	Lab Sample No.	Sample Collected By RO	Depth in mts	Location Code	Fe mg/l	Zn mg/l	Cu mg/l	Ni mg/l	T. Cr mg/l	Pb mg/l	Cd mg/l	As mg/l	Hg mg/l
1	H.P in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	9/10/2020 9/10/2020	GW 583	Faridkot	60	4151	0.17	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2	adjoining H.P- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	3/11/2020 4/11/2020	GW 631	Bathinda	70	4148	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	4/11/2020 4/11/2020	GW 635	Bathinda	100	4147	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	4/11/2020 4/11/2020	GW 636	Bathinda	60	4149	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahunanwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh	3/11/2020 4/11/2020	GW 634	Bathinda	40	4150	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Permissible limits	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: BDL means Below Method Detection Limit

Monitoring Results of Ground Water Samples under NWMP for the month of April, 2021

Point of Collection	Lab Sample No.	Sample Collected By RO	Location Code	pH	Turb. NTU	Cond $\mu\text{s/cm}$	COD mg/l	TSS mg/l	TDS mg/l	TFS mg/l	T.H as CaCO_3 mg/l	Ca mg/l	Mg mg/l	F mg/l	NO_3 as N mg/l	Cl mg/l	SO_4 mg/l	TAlk as CaCO_3 mg/l	Na mg/l	K mg/l	PO_4 mg/l	SAR	% Na	B mg/l
1) HP in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	GW 801	Faridkot	4151	7.6	BDL	842	BDL	BDL	505	459	157	43	12	BDL	1.4	98	28	285	66	10	BDL	18	20	0.24
2) adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEI Refinery	GW 798	Bathinda	4148	7.5	BDL	2598	BDL	BDL	1469	1277	102	19	13	1.6	10.2	189	134	387	829	31	BDL	45.1	90	0.15
3) Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda.	GW 799	Bathinda	4147	7.7	BDL	3226	BDL	BDL	1748	1524	565	114	68	2.1	9.6	224	127	512	798	47	BDL	18	75	0.18
4) Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda.	GW 800	Bathinda	4149	7.3	BDL	5127	BDL	BDL	2852	2482	1327	348	111	1.61	14.3	468	436	352	971	30	BDL	13.3	65	0.11
5) Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh.	785	Bathinda	4150	8.0	BDL	853	BDL	BDL	510	445	321	64	39	0.39	4.1	92	68	202	104	7	BDL	3.1	49	0.09
Permissible limits	-	-	-	6.5-	5	-	-	-	2000	-	-	200	100	1.5	10.2	1000	400	600	-	-	-	-	-	-

Note: 1) BOD, T.Coli, F.Coli, TKN, Amm.N, P.alk and PO_4 were BDL in all the samples
 2) Pesticides i.e. Alpha HCH, Beta HCH, Gamma HCH, Anilophos, Chloropyrifos, 4,4' DDT, Endosulphan-1, Endosulphan-2, Dieldrin, Aldrin & Malathian were BDL.
 3) BDL means below method Detection Limit.

Monitoring Results of Ground Water Samples under NWMP for month of April, 2021

Sr. no.	Point of Collection	Sample Collected By RO	Location Code	Fe mg/l	Zn mg/l	Cu mg/l	Ni mg/l	T. Cr mg/l	Pb mg/l	Cd mg/l	As mg/l	Hg mg/l
1	HP in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	Faridkot	4151	0.16	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEI Refinery	Bathinda	4148	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda.	Bathinda	4147	0.20	0.15	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda.	Bathinda	4149	0.15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh.	Bathinda	4150	0.19	0.22	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Permissible limits	-	-	-	-	-	-	-	-	-	-	-

Note: BDL means Below Method Detection Limit

SA
B

Monitoring Results of Ground Water Samples under NWMP for the month of Oct, 2021

Sr. no.	Point of Collection	Date of collection/ receipt in lab	Lab Sample No.	Sample Collected By RO	Location Code	pH	Turb. NTU	Cond µs/cm	COD mg/l	TSS mg/l	TDS mg/l	TFS mg/l	T.H as CaCO ₃ mg/l	Ca mg/l	Mg mg/l	F mg/l	NO ₃ as N mg/l	Cl mg/l	SO ₄ mg/l	TAlk as CaCO ₃ mg/l	Na mg/l	K mg/l	PO ₄ mg/l	SAR	% Na	B mg/l
1	H P in the premises of cremation ground of Vill Ratoul Rohi near Malbros International (p) Ltd. Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	-	-	Fardkot	4151	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	17.12.2021	-	Bathinda	4148	7.1	BDL	2442	BDL	BDL	1472	1263	740	169	77	1.8	4.9	506	81	422	308	46	BDL	4.8	5.9	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	17.12.2021	-	Bathinda	4147	7.3	BDL	2439	BDL	BDL	1465	1271	706	164	12	1.7	4.9	513	79	429	312	45	2.8	3.4	BDL	7.3
4	Petrol pump near M's Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	17/12/2021	-	Bathinda	4149	7.1	BDL	2445	BDL	BDL	1481	1265	733	171	74	1.8	5.3	518	80	432	315	45	4.5	2.8	BDL	-
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh Harcharan Singh S/o Sh Rajinder Singh	-	-	Bathinda	4150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Permissible limits	-	-	-	-	6.5-8.5	5	-	-	-	2000	-	-	200	100	1.5	10.2	1000	400	600	-	-	-	-	-	-

- Note: 1) BOD, T.Coli, F.Coli, TKN, Amm-N, P,alk and PO₄ were BDL in all the samples
 2) Pesticides i.e. Alpha HCH, Beta HCH, Gama HCH, Anilophos, Chloropyrifos, 4,4' DDT, Endosulphan-1, Endosulphan-2, Dieldrin, Aldrin & Malathian Were BDL.
 3) BDL means below method Detection Limit.

Monitoring Results of Ground Water Samples under NWMP for month of Oct, 2021

Sr. no.	Point of Collection	Sample Collected By RO	Location Code	Fe mg/l	Zn mg/l	Cu mg/l	Ni mg/l	T. Cr mg/l	Pb mg/l	Cd mg/l	As mg/l	Hg mg/l
1	H P in the premises of cremation ground of Vill Ratoul Rohi near Malbros International (p) Ltd. Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	Fardkot	4151	-	-	-	-	-	-	-	-	-
2	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	Bathinda	4148	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	Bathinda	4147	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4	Petrol pump near M's Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	Bathinda	4149	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh	Bathinda	4150	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Permissible limits	-	-	-	-	-	-	-	-	-	-	-

Note: BDL means Below Method Detection Limit

Monitoring Results of Ground Water Samples under NWMP for the month of April, 2022

Point of Collection	Date of collection/receipt in lab	Sample Collected By RO	Depth in mts	GW Code	Location Code	pH	Turb. NTU	Cond µs/cm	COD mg/l	TSS mg/l	TDS mg/l	TFS mg/l	T.H as CaCO ₃ mg/l	Ca mg/l	Mg mg/l	F mg/l	NO ₃ as N mg/l	Cl mg/l	SO ₄ mg/l	TAlk as CaCO ₃ mg/l	Na mg/l	K mg/l	PO ₄ mg/l	SAR	% Na	U mg/l
1) H.P in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	24/5/22	Faridkot	60	GW (1)	4151	7.5	BDL	1985	BDL	BDL	1076	916	803	178	87	-	-	260	104	264	168	78				BDL
2) adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	24/5/2022	Bathinda	70	GW 62	4148	7.9	BDL	315	BDL	BDL	161	137	114	34	7	0.17	0.13	24	7	103	20	5	BDL	0.7	1.0	0.10
3) Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	24/5/22	GW 64	Bathin	100	4147	8.0	BDL	2783	BDL	BDL	1655	1407	104	38	11	4.31	7.82	357	165	542	673	65	BDL	19.2	57	0.34
4) Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	24/5/22	GW 65	Bathin	60	4149	7.8	BDL	913	BDL	BDL	558	476	171	37	19	2.35	2.01	65	24	264	198	46	BDL	5.9	47	0.19
5) Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh	24/5/22	GW 67	Bathin	40	4150	7.9	BDL	673	BDL	BDL	383	327	108	33	6	0.31	0.47	39	17	235	104	18	BDL	26.8	58	0.16

- Note: 1) BOD, T.Coli, F.Coli, TKN, Amm.N, P,alk and PO₄ were BDL in all the samples
 2) Pesticides i.e. Alpha HCH, Beta HCH, Gama HCH, Anilophos, Chloropyrifos, 4,4' DDT, Endosulphan-1, Endosulphan-2, Dieldrin, Aldrin & Malathian Were BDL.
 3) BDL means below method Detection Limit.

Monitoring Results of Ground Water Samples under NWMP for month of April, 2022

Sr. no.	Point of Collection	Lab Sample No.	Sample Collected By RO	Depth in mts	Location Code	Fe mg/l	Zn mg/l	Cu mg/l	Ni mg/l	T. Cr mg/l	Pb mg/l	Cd mg/l	As mg/l	Hg mg/l
1	H.P in the premises of cremation ground of Vill. Ratoul Rohi near Malbros International (p) Ltd., Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	GW (1)	Faridkot	60	4151	0.15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	GW 62	Bathinda	70	4148	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	GW 64	Bathinda	100	4147	0.37	0.20	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	GW 65	Bathinda	60	4149	0.18	0.11	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh.	GW 67	Bathinda	40	4150	0.15	0.10	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL means Below Method Detection Limit

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Monitoring Results of Ground Water Samples under NWMP for the month of Oct, 2022

Sr. no.	Point of Collection	Date of collection/receipt in lab	Lab Sample No.	Sample Collected By RO	Location Code	pH	Turb. NTU	Cond µs/cm	COD mg/l	TSS mg/l	TDS mg/l	TFS mg/l	T.H as CaCO ₃ mg/l	Ca mg/l	Mg mg/l	F mg/l	NO ₃ as N mg/l	Cl mg/l	SO ₄ mg/l	TAlk as CaCO ₃ mg/l	Na mg/l	K mg/l	PO ₄ mg/l	SAR	% Na	B mg/l	
1	H.P in the premises of cremation ground of Vill Ratoul Rohi near Malbros International (p) Ltd. Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi-Zira Road Zira	-	-	Faridkot	4151																						
Sample not collection																											
2	adjoining HP- Petrol Pump, at a distance of Approx at 200 from M/s HMEL Refinery	11/10/2022	GW 177 (a)	Bathinda	4148	7.6	BDL	2270	BDL	BDL	1270	1090	122	24	15	1.4	8.9	172	129	368	798	35	BDL	42.8	82	BDL	
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	12/10/22	GW 177	Bathinda	4147	7.9	BDL	2234	BDL	BDL	1382	1176	729	153	84	1.0	2.3	155	148	312	591	8	BDL	21.2	88	0.08	
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	12/10/22	GW 178	Bathinda	4149	7.6	BDL	1186	BDL	BDL	710	604	460	20	90	0.64	0.82	66	48	608	90.1	9	BDL	1.8	27	BDL	
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt Sri Muktsar Sahib in the house of Sh Harcharan Singh S/o Sh. Rajinder Singh	12/10/22	GW 179	Bathinda	4150	8.0	BDL	4580	BDL	BDL	2693	2291	707	128	94	1.91	3.61	665	598	88	763	29	BDL	25.5	85	0.09	
Permissible limits						6.5-	5	-	-	-	2000	-	-	200	100	1.5	10.2	1000	400	600	-	-	-	-	-	-	

- Note: 1) BOD, T.Coli, F.Coli, TKN, Amm.N, P.alk and PO₄ were BDL in all the samples
 2) Pesticides i.e. Alpha HCH, Beta HCH, Gama HCH, Anilophos, Chloropyrifos, 4,4' DDT, Endosulphan-1, Endosulphan-2, Dieldrin, Aldrin & Malathion Were BDL.
 3) BDL means below method Detection Limit.

Monitoring Results of Ground Water Samples under NWMP for month of Oct, 2022

Sr. no.	Point of Collection	Sample Collected By RO	Location Code	Fe mg/l	Zn mg/l	Cu mg/l	Ni mg/l	T. Cr mg/l	Pb mg/l	Cd mg/l	As mg/l	Hg mg/l
1	H.P in the premises of cremation ground of Vill Ratoul Rohi near Malbros International (p) Ltd. Village Mansoorwal, Tehsil Zira, Distt Ferozpur along Talwandi- Zira Road Zira	Faridkot	4151	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2	adjoining HP- Petrol Pump, at a distance of Approx at 200 from M/s HMEL Refinery	Bathinda	4148	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda	Bathinda	4147	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt Bathinda	Bathinda	4149	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
5	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt Sri Muktsar Sahib in the house of Sh Harcharan Singh S/o Sh. Rajinder Singh	Bathinda	4150	0.62	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Permissible limits				-	-	-	-	-	-	-	-	-

Note: BDL means Below Method Detection Limit

Sr. No.	Name of Parameters	Remarks
1	Calcium	There are 3 no. samples in the data of last 3 years, ranging from 218 mg/l to 348 mg/l against permissible value of 200 mg/l.
2	Magnesium	There are 01 no. sample in the data of last 3 years, with value of 111 mg/l against permissible value of 100 mg/l.
3	Sulphate	There are 04 no. samples in the data of last 3 years, ranging from 410 mg/l to 598 mg/l against permissible value of 400 mg/l.
4	T. Alkalinity	There are 02 no. samples in the data of last 3 years, value is 608 mg/l and 648 mg/l against permissible value of 600 mg/l.
5	Fluoride	There are 07 no. samples in the data of last 3 years, ranging from 1.6 mg/l to 6.44 mg/l against permissible value of 1.5 mg/l.
6	Total Dissolved Solids	There are 04 no. samples in the data of last 3 years, ranging from 2643 mg/l to 2882 mg/l against permissible value of 2000 mg/l.

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Calcium mg/l

Sr. no.	Name of Station	Ca mg/l	IS 10500: 2012 value	Date of Monitoring
1	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	218	200 mg/l	20.5.2020
2	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	318	200 mg/l	4.11.2020
3	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	348	200 mg/l	April 2021

Magnesium mg/l

Sr. no.	Name of Station	Mg mg/l	Standard Value	Date of Monitoring
1	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	111	100 mg/l	-

Sulphate mg/l

Sr. no.	Name of Station	GW Code	SO4 mg/l	Standard Value	Date of Monitoring
1.	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	418	410	400 mg/l	8.5.2020
2.	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	631	424	400 mg/l	4.11.20
3	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	800	436	400 mg/l	April 11
4	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh.	179	598	400 mg/l	12.10.2022

T.Alkalinity mg/l

Sr. no.	Name of Station	GW Code	T.Alkalinity mg/l	Standard Value	Date of Monitoring
1.	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	418	648	600 mg/l	8.5.2020
2	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	178	608	600 mg/l	12.10.22

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Fluoride mg/l

Sr. no.	Name of Station	GW Code	F mg/l	Standard Value	Date of Monitoring
1.	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	418	1.62	1.5 mg/l	8.5.2020
2.	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	420	6.44	1.5 mg/l	8.5.2020
3	Gurukul College near Ash Dykes ru of GuNanak Dev Thermal Power Plant, Bathinda.	635	1.6	1.5 mg/l	4.11.2020
4	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	636	4.2	1.5 mg/l	4.11.2020
5	adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	798	1.6	1.5 mg/l	April, 21
6	Gurukul College near Ash Dykes of Guru Nanak Dev Thermal Power Plant, Bathinda.	799	2.1	1.5 mg/l	April, 21
7	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	800	1.6	1.5 mg/l	April, 21

Total Dissolved Solids mg/l

Sr. no.	Name of Station	TDS mg/l	Standard Value	Date of Monitoring
1.	Adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	2838	2000 mg/l	8/05/2020
2.	Adjoining HP- Petrol Pump, at a distance of Approx. at 200 from M/s HMEL Refinery	2882	2000 mg/l	04/11/2020
3.	Petrol pump near M/s Guru Hargobind thermal plant, Lehra Mohabbat, Distt. Bathinda .	2852	2000 mg/l	April/2021
4.	Tubewell installed along with a link road meeting Muktsar-Malout road from village Rahurianwali Distt. Sri Muktsar Sahib in the house of Sh. Harcharan Singh S/o Sh. Rajinder Singh.	2643	2000 mg/l	12/10/2022

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