Fourth Primary Education Development Program (PEDP-4)

Semi-Annual Environmental Monitoring Report

DEPARTMENT OF PUBLIC HEALTH ENGINEERING

July 2021 – Dec 2021

[A report on WASH facilities and its environmental impact under PEDP-4]

Primary Education Unit, DPHE, Dhaka

December' 2021

Contents

ABBREVIATIONS & ACRONYMS

ADB	:	Asian Development Bank
AusAID	:	Australian Agency for International Development
CIDA	:	Canadian International Development Agency
DFID	:	Department for International Development (of the United Kingdom)
DP	:	Development Partner
DPEO	:	District Primary Education Officer
DPE	:	Directorate of Primary Education
DPHE	:	Department of Public Health Engineering
DTW	:	Deep Tube Well
EFA	:	Education For All
EMF	:	Environmental Management Framework
EU	:	European Union
GOB	:	Government of Bangladesh
IDA	:	International Development Association
JARM	:	Joint Annual Review Mission
JCM	:	Joint Consultation Meeting
JICA	:	Japan International Cooperation Agency
LGD	:	Local Government Division
MIS	:	Management Information System
MLGRD&C	:	Ministry of Local Government, Rural Development and Cooperatives
MoPME	:	Ministry of Primary and Mass Education
MOU	:	Memorandum of Understanding
PEDP-4	:	Fourth Primary Education Development Program
SDTW	:	Semi Deep Tube Well
SEC	:	Small Ethnic Community
STW	:	Shallow Tube Well
SIDA	:	Swedish International Development Agency
TSP	:	Tube Well with Submersible Pump
UNICEF	:	United Nations International Children's Emergency Fund
WB	:	World Bank

EXECUTIVE SUMMARY

The prime objective of PEDP-4 is to ensure an efficient, inclusive and equitable primary education system through a child friendly physical learning environment. Infrastructural development in terms of construction of class rooms and wash blocks, installation of safe drinking water points plays an important role in achieving the sustainable physical learning environment as well as ensuring holistic development of children. Department of Public Health Engineering (DPHE) is solely responsible to provide the water supply and sanitation facilities in the primary schools of Bangladesh. As per MoU signed in between DPE and DPHE in September 15, 2019 DPHE will install 15,000 new water points and construct 58,000 Wash Blocks in the primary schools of Bangladesh throughout the program tenure (July/2018 to June/2023) of 5 years. In addition, DPHE will conduct water quality tests of earlier installed 65,000 water points and major maintenance of wash blocks constructed during PEDP-3. From the beginning of the project until December'2021 DPHE installed 527 new water points and constructed 658 Wash Blocks. In this tenure, DPHE conducted major maintenance of 608 wash blocks and conducted arsenic screening in 15,000 water points which were installed in PEDP-3. DPHE officials tried their best to reach the target of maintaining the covid-19 safety issues within the time boundary.

The sole purpose of this study is to identify any concern or issue related to the environmental safeguard due to the construction of wash blocks, installation of water points and major maintenance of wash blocks from July' 21 to December'21. The study is based on the environmental safeguard screening conducted during construction and post implementation stages. The screening format is prepared after the approved EMF guidelines of DPE for PEDP-4. The screening included different environmental safeguard indicators such as loss of agricultural land, blockage in the drainage system, provision for access to safe drinking water, provision of hand washing and hygiene facilities etc.

The screening was conducted by DPHE officials at the Upazilla level which was duly verified in district level and compiled in DPHE headquarter. It cannot be denied that COVID-19 situation slowed down the overall construction and implementation progress. However, the environmental monitoring screening confirmed no significant instances or issues that may hamper or influence the environmental safety during the reporting tenure. Being an implementing agency, DPHE would like to uphold this status in its ongoing and upcoming works related to infrastructural development.

1. Introduction

Bangladesh, a country with its astonishing economic boom has cherished the golden jubilee of its independence. For a rapidly developing country like Bangladesh, it is utmost important to ensure holistic development of the children which includes both intellectual and emotional development in such a manner that they can uphold the nation from all aspect. This has been eloquently articulated in the Constitution of Bangladesh as well. Fourth Primary Education Development Program (PEDP-4) is the continuation of Government's approach in thriving the excellence of children through the fulfillment of several distinct milestones including construction of need-based infrastructures for sanitation and water supply. The program is supported by significant contributions from Government as well as Development Partners (DPs). Department of Public Health Engineering (DPHE) under Local Government Division (LGD) of Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) is involved in the capacity of implementation partner to provide the quality water supply and sanitation facilities in the primary schools of Bangladesh. As per MoU signed in between DPE and DPHE in September 15, 2019, DPHE will perform the following activities in the next five years with an aim to provide safe drinking water and sanitation services in the primary schools under PEDP-4.

- Install 15,000 new drinking water sources in the primary schools.
- Replace/repair drinking water sources (if necessary).
- Water quality testing of 65,000 water points installed earlier.
- Construction of 58,000 new Wash Blocks in 29000 primary schools.
- Major maintenance of wash blocks.
- Installation of water supply and sanitation facilities in the DD, DPEO, URC, PTI.
- Operation and maintenance (O/M) of water points.

2. Purpose of current report

The basic intent of this report is to identify and resolve any anticipated environmental safeguard issues that may arise during the installation of water sources or construction of Wash Blocks in the primary schools of Bangladesh. This report will encompass and summarize the findings of the environmental screening conducted during the installation of water points and construction of Wash Blocks in the primary schools of Bangladesh from the tenure of July'21 to December'21. During implementation of the project, environmental monitoring screening was conducted based on the Environmental Management Framework (EMF) of PEDP-4. The purpose of this report is listed below.

- To modify some of the tools based on the experiences gained from PEDP-3 to ensure that neither the infrastructure (both in terms of needs and quality at primary schools) nor the environment is compromised through the program intervention.

- To ensure that envisaged purpose of PEDP-4 is achieved and result in desired benefits without adversely affecting the environmental resources.
- To avoid potentially adverse environmental impacts and enhance environmental outcomes so that the program is expected to have limited and minimum adverse environmental impacts.
- To establish the mechanism to determine and assess future potential environmental impacts of WASH infrastructure that are to be identified and cleared based on a community demand driven process and to set out mitigation, monitoring and institutional measures to be taken during implementation and operation of the WASH infrastructure to eliminate adverse environmental impacts or to reduce them to acceptable limits.

3. Indicators of environmental safeguard as per EMF under PEDP-4

This report covers different distinct environmental monitoring indicators based on the approved EMF of PEDP-4. Principles relevant to the environmental management of WASH (Water Supply, Sanitation and Hygiene) in PEDP-4 are mentioned below.

- Annual water quality monitoring of all the installed tube-wells under PEDP-3 will be carried out to ensure safe drinking water facilities to the students and teachers.
- Provision for adequate sanitation facilities for the teachers and students will be made and the mechanism for regular cleaning, routine and major maintenance will be implemented.
- To solve the drinking water problem in remote hilly and coastal areas, rainwater harvesting and other feasible options will be explored.
- To address the post COVID crisis for adaptation to the new normal.

In general, the following indicators require to be monitored during the planning, construction and post-implementation phases.

i) Losses of agricultural lands
ii) Drainage congestion/water logging
iii) Surface water pollution
iv) Dust and noise pollution
v) Safe distance between tube-wells and sanitary latrines
vi) Occupational health hazards and safety practices
vii) Maintenance of water supply and sanitation facilities
viii) Maintenance of air and water quality
ix) Management of surrounding ecosystem and biodiversity (if any) etc.
x) Ensure that COVID safety protocols are well adhered.

A thorough screening on the above indicators were carried out during the reporting tenure.

4. Methodology

With an aim to investigate the impact of infrastructural development on environmental safeguard, a through screening was carried out in the respective primary schools by the concerned sub-assistant engineers of DPHE. The screening results were duly verified by the respective assistant engineers and a database was prepared at Upazilla level. Executive engineers at district level complied the verified database obtained from Upazilla level and sent them to DPHE Head Quarter at the MIS (Management Information System) unit, where the database was finally compiled and report was prepared under the supervision of focal point of PEDP-4.

Data for environmental safeguard screening during the installation of water sources and maintenance of Wash Blocks have been collected from the schools through DPHE official sources using the structured format (copy enclosed in Appendix-1 of this report). Data collected from grass root level have been entered into 'Master Environmental Survey Outcome' Spreadsheet by MIS UNIT and kept structured for database and reporting. A flow diagram of the screening method is depicted in Fig. 1.

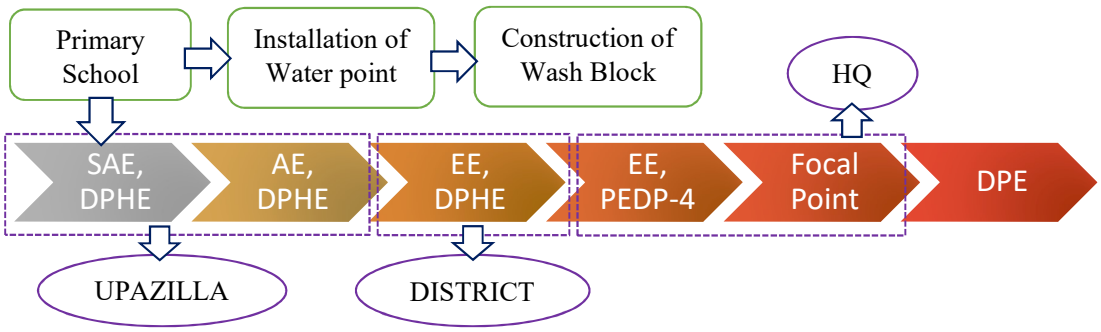

Fig. 1 Method of environmental safeguard screening

5. Role of DPHE in comprehensive monitoring

The subcomponents (sub component 2.3 and 2.4) of PEDP-4 especially the infrastructural implementation is comprehensively monitored by several parties from commencement to operational phase. Fig.2 shows the monitoring scheme in PEDP-4 operated by different agencies. Being an implementing agency, DPHE is involved significantly from construction till post-construction monitoring. Role of DPHE is depicted in Fig.3. It can be noted that the defect liability period for installed water points and constructed wash blocks are 02 and 01 year respectively. This implies that contractor is responsible to rectify any sort of defects within this time frame counting from the date of handover of tube well and wash block. In order to get a clear picture of ongoing and completed works, DPHE district office arranges monthly monitoring meeting with all concerned officers and staffs of that district. Executive Engineers thus address the issues of monitoring to the assistant/ sub assistant engineers monthly. Officers of concerned district used to visit the site frequently in order to monitor the

ongoing and completed works and also focus on the environmental safeguard aspect. Visit from Focal Point's Office and DPHE Head quarter happens frequently.

DPHE district office arranges coordination meeting between DPHE (EE, AE, and SAE) and DPE officials (DPEO, UEO) in every 3 months. A glimpse of the co-ordination meeting is depicted in Fig. 4. In this meeting, officers from department of primary education point out the necessity of monitoring of particular school which are immediately addressed by DPHE officials. Besides these, to get better insight and ensure quick action, DPHE has introduced a new system of arranging monthly meeting between DPHE officials and Headmasters of Primary School during this reporting tenure as a part of routine monitoring process (Fig 17). In addition, mechanics of DPHE upazilla headquarters repair the tube wells in an urgent basis when they are called for doing from the concerned school in order to ensure that the running water supply are fully operational.

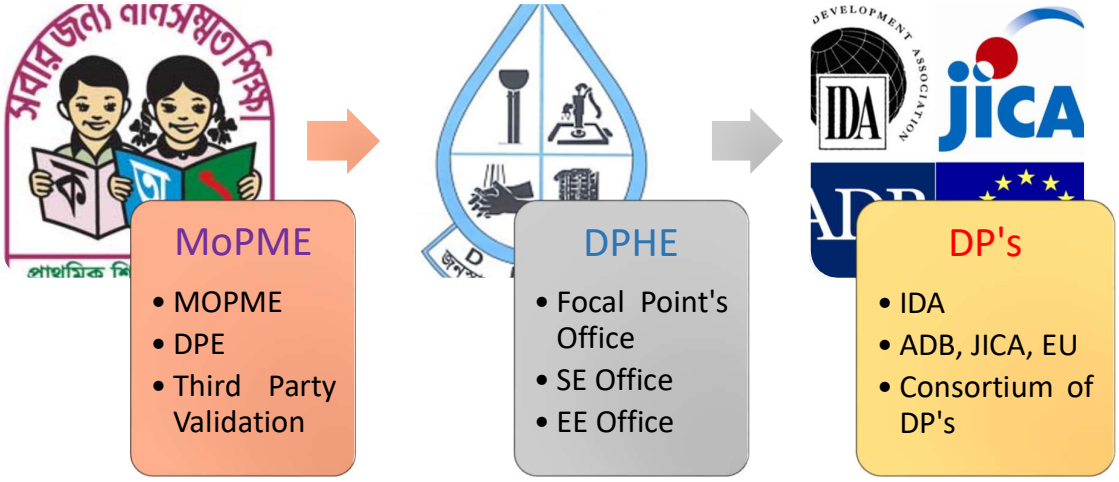

Fig. 2 Monitoring scheme in PEDP-4

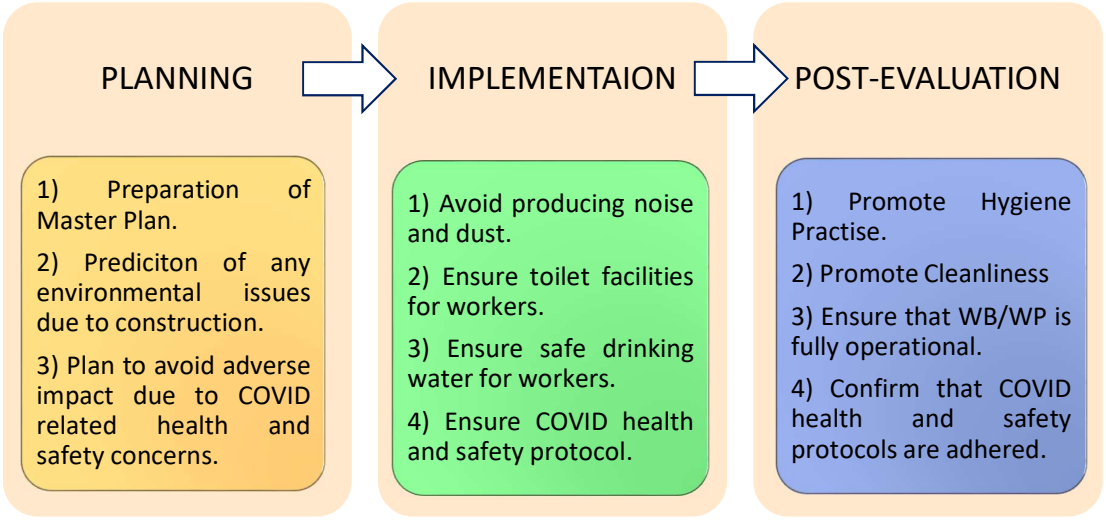

Fig. 3 Role of DPHE in environmental monitoring

Fig. 4 Co-ordination meeting between DPE & DPHE Officials at Rajshahi district

DPHE arranges caretaker training and provides MoPME approved 'Maintenance Manual' to the concerned schools during the handover of water points and wash blocks which covers post construction issues. Contact numbers of DPHE officials (mechanics and assistant/sub-assistant engineers) are provided to the concerned schools so that any relevant issues can be addressed accordingly. Moreover, DPHE looks after the tube wells which have already passed the defect liability period of 02 (two) years. According to the order of Chief Engineer, DPHE (memo no. 1066, dated: 16/09/2013), the packages where the defects liability period is over, DPHE will still repair the tube wells within 72 hours of receiving information provided that the concerned school bears the expense of spare parts from routine maintenance.

6. Capacity building

During the implementation of PEDP-3, a ToT (Training of the Trainers) was conducted by the World Bank among DPE, DPHE and LGED officials. The purpose was to introduce the proposed framework for environmental and social safeguard under PEDP-3 along with the importance of conducting rigorous monitoring. In addition, screening method was agreed and confirmed based on targeted outcomes. DPHE officials (Executive Engineers, Senior Assistant Engineers and Assistant Engineers) who received ToT provided trainings to the sub-assistant engineers and mechanics in the district and upazilla level who eventually filled in the environmental screening forms in the grass root level.

In PEDP-4, a revised framework is adopted for both environmental and social safeguard. The basic changes are little but elaborate in comparison to that of PEDP-3. Recently (December 5/2021), ADB conducted a short virtual training workshop on Occupational, Community and COVID-19 Health and Safety Management at the Construction works. Officials, consultants and contractors of both DPHE and LGED attended the training workshop. Although the duration of the training was short, it was effective and guided the participants with valuable insights related to construction safety and COVID-19 health and safety management at construction site. A training manual was also circulated, glimpse of which is provided in Fig. 5.

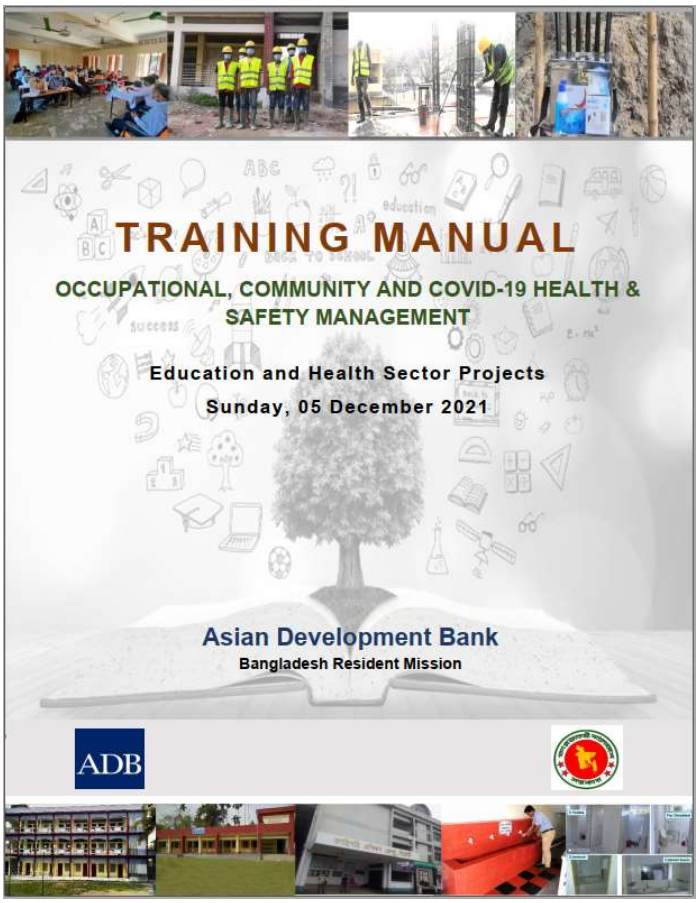

Fig. 5 ADB circulated virtual training manual

During the reporting tenure, DPHE master trainers from Head Quarter and circle Head Quarter (who received ToT during PEDP-3) conducted day long circle level meetings to expedite the works related to the construction of wash blocks and installation of water sources and for the smooth implementation of construction work by adhering the guidelines of both revised EMF and SMF and COVID-19 health and safety protocol. Photo of such circle level meeting from Faridpur is depicted in Fig.6. Thus, the trained engineers try and function as peer educators to educate the site workers and contractors. In order to identify the key differences of revised EMF and SMF to that of original EMF

and SMF of PEDP-3, newly designed training should be carried out by the experts (from both GoB and DP's) who had inputs during the preparation of revised EMF and SMF.

Fig. 6 CE, DPHE along with Circle SE and other high officials attending co-ordination meeting

7. Environmental safeguard screening by DPHE (July'21 – December'21)

It cannot be denied that COVID-19 situation slowed down the overall construction and implementation progress. But with restrictions being lessened, DPHE has quickly adapted to the new normal by developing a comprehensive COVID-19 Site Operating Procedure (SOP) alongside several site and task specific risk assessments. DPHE constructed and installed a total of 7,418 wash blocks and 5,168 water points till date from the beginning of this project. Among these, a total of 658 wash blocks and 527 water points were installed and handed over during the reporting tenure of July'2021 to Dec'2021. In addition, DPHE monitored 15,000 water points (installed in PEDP3) for arsenic contamination. All these works were monitored based on approved Environmental Monitoring Framework (EMF) for PEDP-4. Table-1 summarizes the list of DPHE implemented works where screening for environmental safeguard was carried out.

Table 1 Progress of work under PEDP-4, DPHE

Scope of Work	July'19 - Dec'19	Jan'20 - June'20	July'20- Dec'20	Jan'21 - June'21	July'21- Dec'21	Total
Construction of Wash Block	-	-	672	6,088	658	7,418
Installation of Water Sources	57	183	2,145	2,256	527	5,168
Maintenance of Wash Block	91	598	3,200	810	608	5,307
Water Quality Monitoring	-	-	-	-	15,000	15,000

This report focuses on the construction work from the tenure of July'2021 to December'2021. During this period, not only new wash blocks were constructed and water points were installed, major maintenance of 608 wash blocks which were constructed during PEDP-3 were carried out as well. Furthermore, 15,000 water points installed during PEDP-3 were monitored for arsenic contamination. The status of the water points and wash blocks received through the monitoring survey is given in following subsections.

8. Outcomes of environmental safeguard screening

8.1 Influence of type of water point

Planning from the lessons learnt in PEDP-3

It is fact that, DPHE installed water points of different options such as Deep Tube Well (DTW), Shallow Tube Well (STW), Tara Tube well, Ring Well (RW), Pond Sand Filter (PSF), Rain Water Harvesting (RHW) in PEDP-3 based on the variation in geological formation, position of aquifer /water table, saline water intrusion etc. However, all those options have certain advantages as well as multiple drawbacks. The common of which is the ease of availability of water from source and their familiarization and user friendliness to the young users.

Mitigation Measures Suggested (MMS):

In order to mitigate the concerns and to make the water sources more popular and user friendly, DPHE installed Tube well with Submersible Pump (TSP) in the primary schools where deep tube well (depth >200m) is required to be installed under PEDP-4 due to ground geology. This option has special features such as-

- Running water supply with storage facility.
- Multiple users can access at the same time.
- Promote hygiene practice through safe hand washing.

Comment:

Installation of tube well with submersible pump added values to its user especially young user which eventually *increases the easy access to safe drinking water result in health benefit* as well as diminishes water logging and drainage problem.

8.2 Distribution of water points based on installed depth

DPHE installed tube wells of varying depth in different primary schools of Bangladesh considering the geological formation of respective district. Although the depth of tube well depends on the suitable water layer, all the tube wells installed in the reporting tenure can be broadly categorized into five distinct types based on the depth of tube well. Fig. 7 depicts the classification of tube wells based on depth. As shown in Table 1, a total of 5,168 nos. of water points were installed under PEDP4 till date.

It is clear from Fig. 7 that 23.5% tube wells were installed at a greater depth of 275m or more which is considered as deep tube well. Around 36.2% tube wells were installed in shallow depth (<65m). Tube wells installed in between 65m to 275m are also deep tube wells and this percentage is highest (40.3%) amongst all the installed water points.

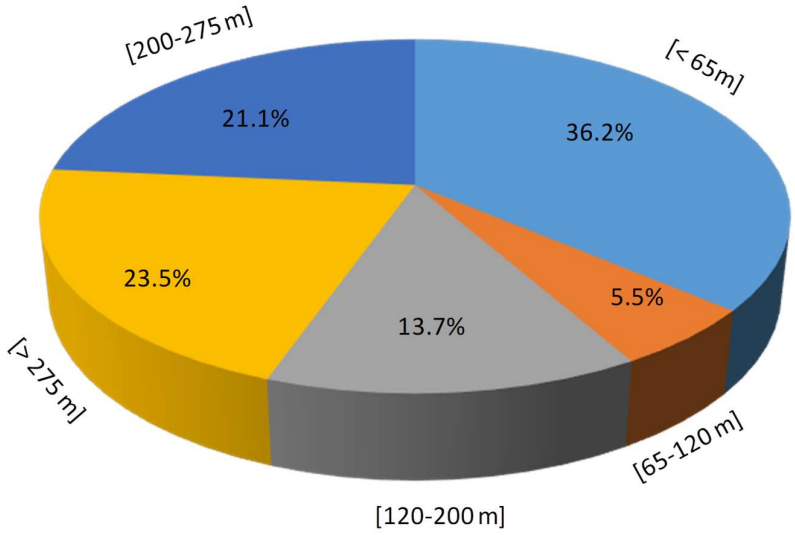

Fig. 7 Distribution of Water Points based on Depth of Boring

8.3 Countrywide distribution of water sources & wash blocks

Countrywide distribution of tube wells and wash blocks were analyzed and division wise categorization for water source and wash block is depicted in Figs. 8 and 9 respectively. Fig. 8 depicts the equity in distribution of water sources. Among the total installed water points, the highest number was installed in Sylhet division followed by Rajshahi and Chattogram division while the minimum

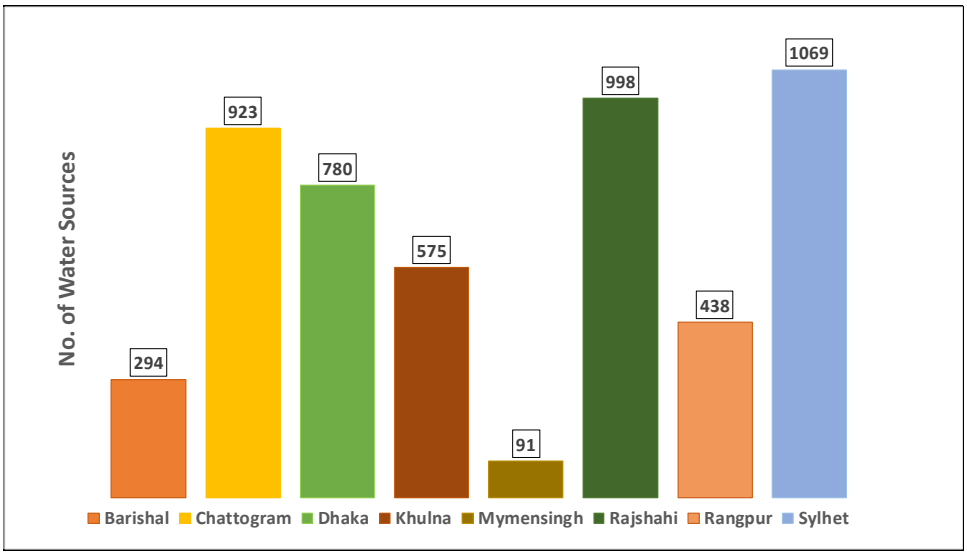

Fig. 8 Countrywide distribution of water points

number of water points were installed in Mymensingh division. This is as per need assessment criteria and approved list supplied by DPE based on approved IPG.

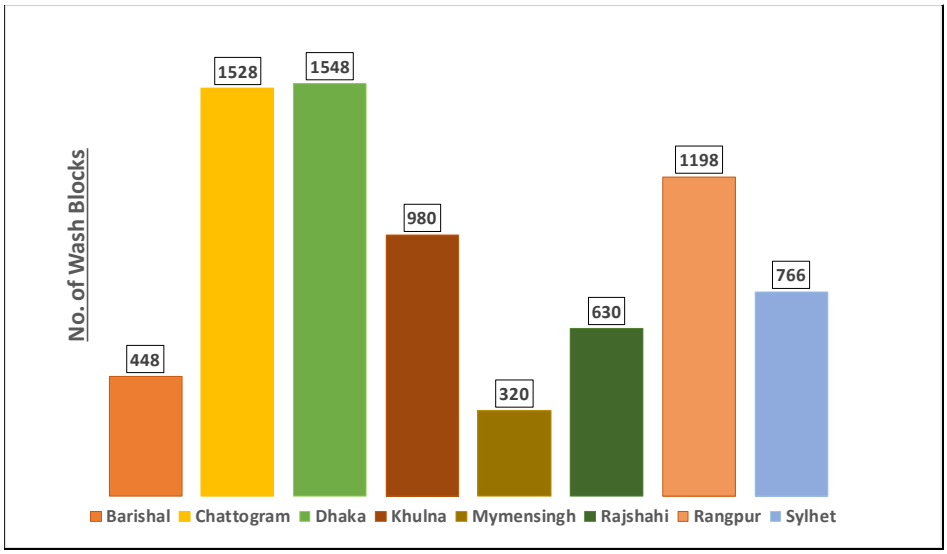

Fig. 9 Countrywide distribution of wash blocks

Fig. 9 reflects the countrywide distribution of wash blocks depending on the number of districts and upazillas in each division. The maximum number of wash blocks were constructed in the Dhaka, Chattogram, Rangpur, Khulna division as these divisions cover maximum districts. The lowest number of wash blocks (320) were constructed in Mymensingh division as it is the smallest division of Bangladesh and thus, equity in distribution is justified.

Wash Block is serving as a unique unit of hygiene practice for the school children as well as for teachers. Its impact on environment is high as it helps to promote hygiene as well as safe and clean school environment. Open defecations and urination practices decreases and confirms better health through improved washing facilities. On the other hand, tube well ensures safe drinking water for the school children as well as for the teachers.

8.4 Loss of agricultural land

During the preparation of site plan/ master plan it was the prime focus that the installation of the new water supply facility does not preclude the use of existing agricultural lands. No loss of agricultural lands was recorded from the environmental screening survey conducted for the water points installed from July'21 to December'21. Similarly, construction of wash block was carried out in those schools where land is owned by the respective school. Furthermore, prior to the construction of either wash block or installation of water sources, it was confirmed that the master plan was prepared by the MoMPE approved committee. In some cases, (approximately 1% of total construction) design and arrangement of wash blocks were modified based on the prevailing site condition keeping the floor area similar.

However, the overall process of construction of wash block did not require purchase of new land from school which ensured no loss of agricultural land.

8.5 Environment of water supply facility

In case of water points 'Clean Environment' refers to the surrounding of the installed water option. If the surrounding environment is not dirty and/or not covered with algae then it would be referred to as 'Clean'. Post installation monitoring of all water points have been conducted. Clean environment was found in 93% of the total water points as depicted in Fig. 10. As the schools were closed due to the COVID-19 situation, there was lack of maintenance and blocked drainage due to waste dumping near the outlet was observed. It can be noted that due to the provision of basin type water points, water logging and or other problems related to dirty environment have been dramatically reduced than that observed during the environmental screening of other types of tube well installed in PEDP-3 program.

Mitigation Measures Suggested (MMS):

During the monitoring phase, mitigation measures were suggested to the concerned school such as cleaning of basin, removal of leaves and other utensils that causes blockage of the drains etc. Because of taking mitigation measures, caretakers' training and routine maintenance during monitoring phase, environment of water supply facility improves to 100% from 93%.

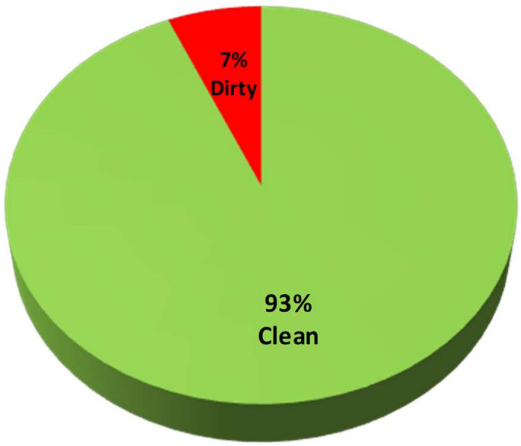

Fig. 10 Environment of water supply facility

8.6 Surface Water Pollution:

Both the water sources and wash blocks were installed in such a manner that they do not adversely pollute the surface water. The environmental screening of all 658 Wash Block and 527 Water Points installed from July'21 up to Dec'21 revealed that they did not pollute any surrounding water bodies.

8.7 Facilities for draining out of water

From the lessons learnt during the environmental screening in PEDP-3, DPHE took initiative in solving the water logging problem by adopting different measures.

1) Pipe out used water to the existing drains.
2) Construction of 5 user water collection basin having 50mm dia. PVC washout pipe. Fig. 11. shows a newly constructed 5 outlet hand washing basins under PEDP-4.
3) Use of 8 ring soaks well to drain out basin water where surface drain is absent.

Fig. 11 Ongoing inspection of 5 outlet water collection basin

As because, DPHE local office took initiative in solving the drainage issue, it has been observed that, the water logging problem is insignificant compared to that in PEDP-3. However, it is revealed that out of 527 water sources about 1% had the problem of water logging. The reasons observed are mainly because of current COVID-19 situation schools are closed and hence the lack of cleanliness program was observed which created blockage of drainage pipe by wastes like paper, tree leaves, mud etc. It is hence suggested that, SMC needs to look after this issue and run regular cleanliness program in the water collection basin and drains.

8.8 Source of Existing Water Supply

During preliminary survey it was found that, out of 527 schools 79.51% did not have their own water option. 43.17% of them used the facility of their neighborhood. Though 20.49% schools have their own tube wells, yet those tube wells were found as non-functional or did not provide sufficient water during dry season. From the lessons learnt during the environmental screening in PEDP-3, DPHE took initiative in solving the above problem by installing new tube wells with submersible pump but at different depth as appropriate to the site geology.

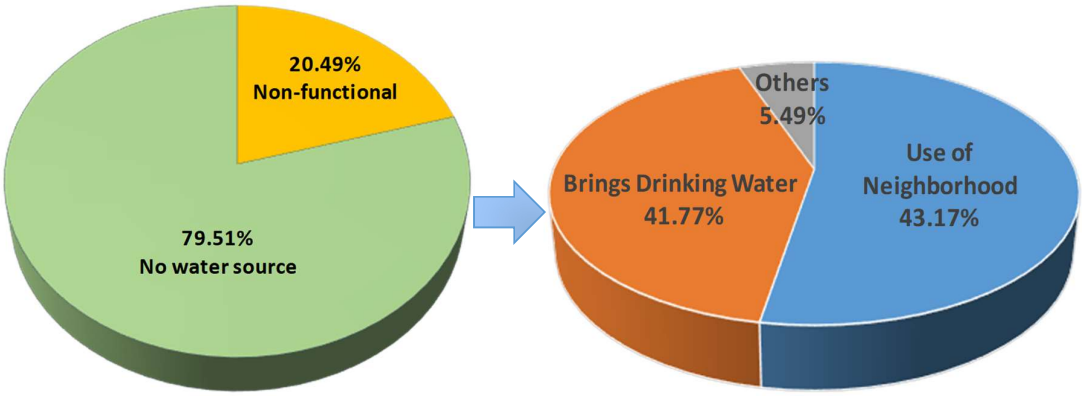

Fig. 12 Assessment of schools where new water points were installed

8.9 Water Quality test in Laboratory

Water testing facilities in DPHE zonal laboratory:

It is fact that DPHE has a permanent set up of 13 laboratory buildings including a central laboratory at Mahakhali, Dhaka. Recently, DPHE completed the set-up of 52 laboratory buildings in 52 districts which confirmed the establishment of zonal laboratories in all districts to expedite the water quality monitoring. Fig. 13 depicts a newly constructed zonal laboratory of DPHE at Jhalakathi. These newly established laboratories are equipped with modern machineries so that all relevant water quality parameters can be monitored.

Fig. 13 DPHE Zonal Laboratory at Jhalakathi

During installation of water points, suitable water layers are generally selected based on DPHE's experience and geographic location. After installation of new water points in the said 527 schools, laboratory tests were conducted to identify potential hazards of Arsenic, Iron and Chloride in water. The tests were done by the laboratory circle of DPHE and the reports are stored in the DPHE MIS database. From the screening of 527 tube wells, it was found that 29 of them had the concern of excess arsenic (As) and/or, Iron (Fe) beyond the Bangladesh standard (arsenic, iron and chloride content below 50ppb, 5mg/l and 600mg/l respectively) of safe drinking water. For the rest of the cases arsenic, iron and chloride content were found satisfactory during laboratory tests. Water Quality report of those 29 unacceptable water sources and suggested alternative option along with retest result is summarized in Table 1 attached as Appendix-6. Fig. 14 shows the diagrammatic presentation of water quality test results. In addition, ample field tests were conducted in those schools during post monitoring phase by DPHE by using field kit which re-confirmed the DPHE laboratory test results. A sample copy of water quality test result is provided in Appendix-2 and water quality test report for 29 unacceptable water sources have been presented in Appendix-6. A summary of water quality monitoring report is provided in Table 2.

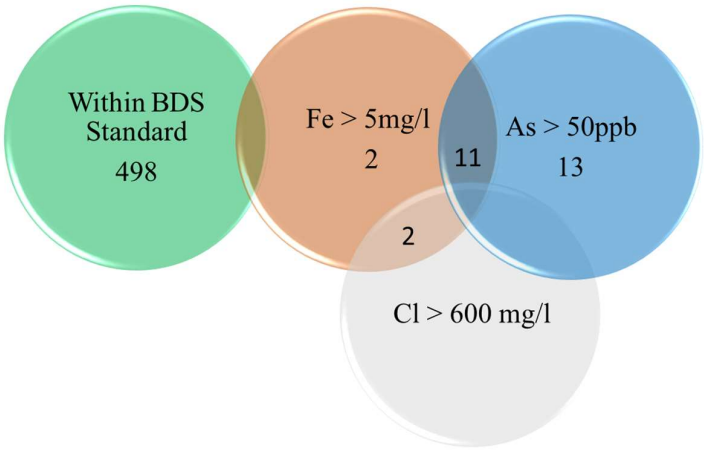

Fig. 14 Water Quality test result at a glance

Table 2 Summary of Water Quality Monitoring Result

Sl. No.	District	Water Quality		Remarks
		Satisfactory	Not Satisfactory	
1.	Chattogram	35	-	List of 'Not Satisfactory' water sources are given in Appendix-6 and Actions taken for the water sources where water quality is not satisfactory are listed in Table 1 of Appendix-6.
2.	Cumilla	101	2	
3.	Munshiganj	18	-	
4.	Noagoan	27	-	
5.	Rajshahi	81	9	
6.	Rangpur	56	2	
7.	Khulna	15	-	
8.	Gaibandha	77	16	
9.	Narial	15	-	
10.	Luxmipur	27	-	
11.	Sherpur	26	-	
12.	Sunamganj	20	-	
Total =		**498**	**29**	

8.10 Water Quality Monitoring

As per MoU signed in between DPE and DPHE in September 15, 2019, DPHE will conduct water quality monitoring of 65,000 water points installed earlier in PEDP-3 with an aim to provide arsenic free safe drinking water in the primary schools of Bangladesh. It has been decided that 90% of the tests will be conducted in field by utilizing field test kits for arsenic and the rest 10% will be conducted in DPHE zonal laboratory. Due to COVID-19 pandemic, schools were closed which is why the field tests could not be conducted in the last financial year. However, all the test kits were bought and well preserved by DPHE in order to conduct the field tests as soon as the schools re-open. Recently, soon

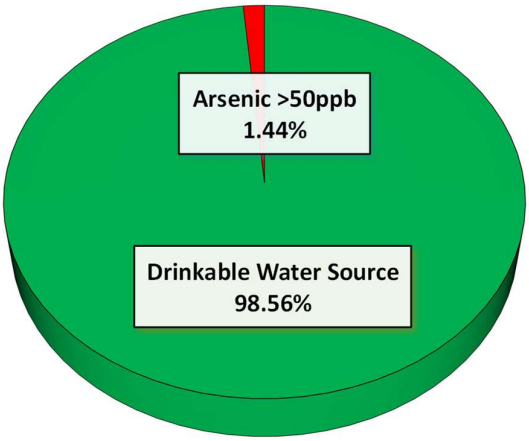

Fig. 15 Water Quality Monitoring result of tested 15,000 Water Points

after the re-opening of the schools, steps have been taken to conduct water quality screening of 15,000 water points. It can be noted that these 15,000 schools were selected by DPE and tests were conducted during the reporting tenure. Test result as shown in Fig. 15 indicates that 1.44% water points have been found to be newly contaminated due to Arsenic. In addition, it was confirmed that water of 98.56% of 15,000 installed tube wells in PEDP-3 are drinkable. DPHE officials immediately took steps in stopping the water intake from these contaminated water points.

Mitigation Measures suggested:

In cases where arsenic/iron/chloride is found beyond allowable BDS standard in installed water sources, DPHE adopts other approved alternate water options. DPHE goes for options like deep tube well of greater depth, ring well, pond sand filter, rain water harvesting, Reverse Osmosis Filter, AIRP, Small box type AIRP etc. whichever is feasible. In some cases, if all the options in hand fails, i.e., boring in greater depth becomes impossible, arsenic is found even in deep tube well and none other option is feasible, DPHE has started implementing 'SONO Filter' as well. DPHE upazilla offices will arrange and install the said filter in those water sources whichever is feasible, convenient and justified. In addition, water from those sources will be further tested and declared safe if found well below the BDS standard of drinking water. Fig. 16 shows some of the suggested filtration technologies.

Fig. 16 Different Suggested Improved Filtration Technologies

8.11 Hand washing facility and Hygiene Promotion:

Prior to the installation of water sources, hand washing of students before and after meal especially mid-day meal and after using toilet was a matter of concern. As a result, students were more susceptible to diseases which triggered the absence of students from school. Besides these, newly constructed wash blocks with modern interior facility will surely create enthusiasm among children for the best utilization of wash blocks. A glimpse of wash block interior is shown in Fig 17.

Mitigation Measures Suggested (MMS):

Working with the moto of 'clean hand, safe hand' DPHE confirmed the installation of tube wells with running water supply by provision of submersible pump in all the above-mentioned schools during the reporting tenure. Construction of wash basin for hand washing (Fig.11) ensured total hand washing facilities in the school. Due to the global pandemic situation, although regular hygiene promotion activities could not be conducted yet monthly coordination meeting with DPE officials, TEO, ATEO and Primary School Headmasters is the indication of intensity of preparation for hygiene activities.

Fig. 17 Modern Interior of Wash Blocks

8.12 COVID-19 Reality, Responsive Action and School Re-Opening

Countries all over the world are trying new ways of softening or partially lifting COVID-19 related restrictions while keeping the virus progression in check. In this challenging time, the future of education depends on the provision of water, sanitation and hygiene services. So, Hygiene Promotion has been emerged as an issue of particular concern when considering reopening of schools. In order to confirm adequate hygiene practise, DPHE district and upazilla level officers monthly conduct sessions related to hygiene promotion activities with TEO, ATEO and Primary School Headmasters in the schools or DPHE district offices. All these activities put positive sign to the improvement of total environment. Prior to the re-opening of the schools DPHE district offices and Upazilla offices conducted disinfection of school premises and maintenance of wash blocks and water sources as and where required. Fig. 18 shows a photo of school disinfection being investigated by executive engineer, DPHE. Besides these all the construction activities regarding construction of wash blocks, maintenance of wash blocks and installation of water sources are constructed following the guidelines by Ministry of Local Government, Rural Development and Cooperatives (Appendix-5).

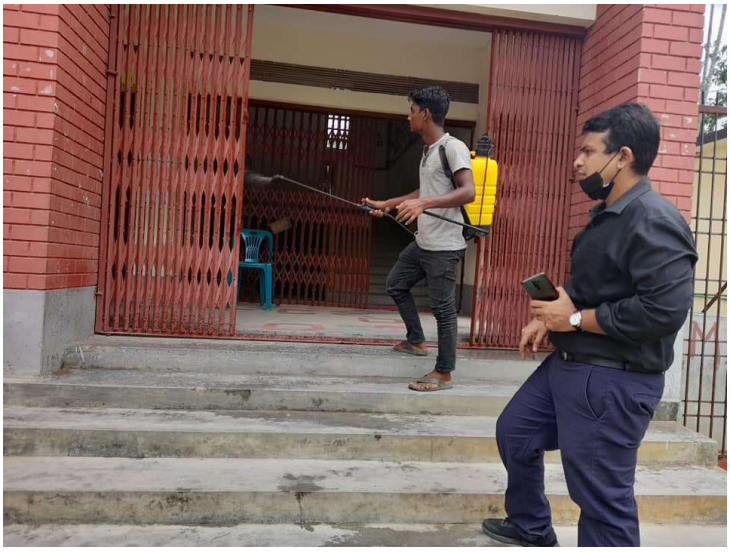

Fig. 18 Executive Engineer, DPHE, Gaibandha inspecting the disinfection process at school

8.13 Miscellaneous observations

During the implementation phase, two basic standards were maintained.

1) Ensure at least a distance of 10m between water points and leach pit/soak well/ septic tank etc.
2) Ensure that the water collection basin is not clogged by paper, dry leaves, mud etc.

During monitoring phase, these options were found to be maintained properly.

8.14 Summary of observations

The post installation monitoring of all 658 Wash Blocks and 527 water points confirmed no major concern or significant issues that can cause adverse environmental impact. Table 3 summarizes some other environmental issues observed during survey of Water points/ Wash Blocks.

Table 3 Important environmental issues observed

Issues/Environment Criteria	Findings from the Survey for all TWs	Findings from the Survey for all WBs
Is the TW installed?	Yes	Yes
Is the existing TW working?	Yes	Yes
Was the installed TW water tested?	Yes	Yes
Is Arsenic < 50ppb?	Yes	Yes

Issues/Environment Criteria	Findings from the Survey for all TWs	Findings from the Survey for all WBs
Is Iron <1mg/l, for iron prone area up to 5 mg/l [Based on Water Quality Monitoring and Surveillance Protocol for Running Water Supply System in Bangladesh by DPHE, Appendix-7]	Yes	Yes
Is Cl ≤ 600 mg/l, for coastal area up to 1000 mg/l [Based on Water Quality Monitoring and Surveillance Protocol for Running Water Supply System in Bangladesh by DPHE, Appendix-7]	Yes	Yes
Loss of agricultural land?	No	No
Negative effect on flora/fauna?	No	No
Conflicts with water supply, right?	No	No
Any potential health risks?	No	No
Is there provision of separate toilet for male and female?	N/A	Yes
Is there provision for adequate ventilation?	N/A	Yes
Is there provision for disabled children?	N/A	Yes

Note: Only the particular water source that met the drinking water quality in the laboratory test is handed over to the primary school authority. DPHE preserves all the testing report in the MIS cell.

8.15 Positive environmental impact

The outcomes of the environmental screening as discussed in the previous subsections pointed out the achievement of following positive impacts through the implementation of revised EMF and SMF during the construction works under PEDP-4.

1) Regular WASH related programs such as hygiene promotion through hand washing campaign not only increased the personal safety of students but also spread the positive vibe in the surrounding society which is now the key lessons for the inhabitants to fight against COVID-19.
2) Through the assurance of contamination free safe water sources in the said primary schools during the reporting tenure, a long-awaited demand was fulfilled which not only improved health potential of users but also reduced the dropout rate.
3) Lessons learnt from PEDP-3 helped in designing the type and structure of water sources with provision of running water free from bacteriological contamination. This initiative dramatically reduced the problem of water logging and drainage which was encountered in PEDP-3.

A summary status of environmental safeguard document is given in Table 4 while overall performance in relation to environment compliance is given in Table 5.

Table 4 Summary Status of Environmental Safeguard Documents

Type of safeguard document	Agency	Latest version	Coverage
Semi Annual Environmental Monitoring Report	DPHE	December/2021	July – December/2021
National Standards of Water, Sanitation and Hygiene for Schools in Bangladesh	UNICEF	January/2011	Till Date
National Strategy for Water Supply and Sanitation	MoLGRD	June/2021	Till Date
Response to Covid-19 Outbreak Through Water, Sanitation and Hygiene Interventions	MoLGRD	June/2020	July/2020-December/2023
COVID-19 Exposure Prevention, Preparedness & Response Plan	DPHE	December/2020	Project Tenure
Site specific Environmental Management Plan (SEMP)	DPHE	December/2019	Project Tenure
Complain and sick register report	DPHE	December/2021	Project Tenure
OHS Plan	DPHE	December/2019	Project Tenure
Overall monitoring checklist	DPHE	December/2019	Project Tenure
Environment test report: included environmental monitoring, checklist, HSE monitoring	DPHE	December/2019	Project Tenure
National Menstrual Hygiene Management Strategy 2021	MoLGRD	June/2020	Till Date

Table 5 Overall performance in relation to environmental compliance

No.	Aspects of Environmental issues	Compliance Status			Remarks
		FC	PC	NC	
A.	**General**				
1.	Legal working hours approval	✓			
2.	Employment Record keeping arrangement	✓			
3.	Payment Record keeping arrangement	✓			
4.	Environment, Health and Safety Officer designated			✓	No provision of fund in DPP in favor of DPHE
5.	Provision for monthly meeting for inspection of site activities	✓			
B.	**Health and Sanitation**				
Occupational Health					
1.	First-Aid Box availability at work sites	✓			
2.	Provision of personal protection equipment's (PPEs)		✓		In some instances, it is difficult to avoid situations like use of mixture machine, vibrator machine etc. during construction
3.	Handling of cement and other hazardous materials by workers	✓			
4.	Workers' complains taken care of by the supervisor	✓			
5.	Children below 18 employment (Not employed)	✓			
C.	**Environmental Pollution**				
Dust and emission control					
1.	Construction vehicles and machineries maintained properly to reduce emissions	✓			
2.	Proper storage of materials and regular watering.	✓			

No.	Aspects of Environmental issues	Compliance Status			Remarks
		FC	PC	NC	
Noise Pollution					
1.	Movement of vehicles at desired hours	✓			
2.	Noise control measures at sites	✓			
Water Pollution					
1.	Land filling	✓			
2.	Wastes, cement, effluents and junks not disposed in water	✓			
Flora and Fauna					
1.	Trees and bushes outside the construction area preserved from damages	✓			
2.	Disturbance to terrestrial fauna minimized	✓			
Waste Management					
1.	Construction wastes are removed off site regularly	✓			
2.	Chemical wastes, if any, collected and disposed of properly	✓			
D.	**Environmental documents at Field Office and Project sites**				
1.	Field Office possesses copies of EMP, contract document and Technical Specifications	✓			
2.	Heavy equipment maintenance records	✓			
	TOTAL =	20	1	1	

9. Health and Safety Guidelines against COVID-19

COVID-19 has disrupted day to day operations in construction work but as the time progresses, our understanding of how the virus spreads has also evolved. In these uncertain times, worksite safety and health are more important than ever before. DPHE follows the rules and regulations proclaimed by the Ministry of Local Government, Rural Development and Co-operatives (MLGRD&C). On 7th May'2020, the MLGRD&C provided some instructions on a basis of emergency for the safety considerations during the pandemic situation (Attached in Appandix-5) vide memo No. 1629 on 07/05/2020. Specific COVID-19 safety guidelines which is recommended for construction workers include-

i) The workers in construction sites have to maintain safe distance (i.e., 1m) from each other and have to wear the mask, hand gloves, gumboot, helmet etc. and no worker will be permitted in the project site without these equipment.

ii) There should be a proper arrangement of soap and hand sanitizer in worksite and all the workers must wash hand with antiseptic soap in an interval of 1 hour and also wash their faces and hands before taking meals and after using meals.

iii) The officials from DPHE headquarter should arrange cautionary meetings on covid-19 safety issues at district level and upazilla level with the Executive Engineer, Assistant Engineer, Sub-Assistant Engineer, and collect the updates from the construction sites about precautionary affairs through proper channel.

iv) In addition to the district level, DPHE officials should arrange meeting with School Head Masters at Upazilla level to make them informed about the safety issues for workers in the construction sites of schools as well as the special affairs due to corona pandemic.

DPHE followed the construction safety protocol during COVID-19 pandemic as outlined above. Table 6 summarizes the COVID response performance at the work sites of all 143 completed contracts during the reporting tenure.

Table 6 COVID response performance at worksite

COVID-19 Response questions	No. of Contracts			Comments
	FC	PC	N/A	
Site re-opening and entry protocol				
Locate the closest medical establishment equipped with COVID -19 response facilities.	143			
Engage a full time EHS professional at site			143	Currently there is no fund provision in DPP in favor of DPHE for addressing safeguard. However, it is under consideration.
Purchase thermometer gun, soap, hand sanitizer, disinfectants and PPEs (mask, hand gloves, hard shoes etc.) and keep it at worksite office.	143			
Establish site entrance protocol. Redesign the site safety notices/signboards/protocol according to the ADB guidelines	143			
Arrange washbasin, soap and clean water at the entrance of every worksite/campsite. Also keep either a disinfectant tub for shoes or keep disinfectant spray that must be sprayed under the boots/hard shoes of the persons entering worksite.	143			
Provide every personnel working in the site with mask, hand gloves and hard shoes for their personal use.	143			
Everyone entering the worksite must wear a mask, gloves and hard shoes	143			
A designated EHS and medical person should stay all time during work. The EHS/Medical person should also monitor campsite. He/she will be in charge of ensuring physical distances (minimum 1m) among workers, disinfecting surfaces that are commonly used and investigate workers'/site personnel health and safety.			143	Currently there is no fund provision in DPP in favor of DPHE for EHS/medical professional
At the start and end of the day disinfect the total worksite.			143	Workers stay at the worksite in labour shed
Encourage site personnel/camp dwellers to not touch their eyes, mouth or nose if not washed thoroughly with soap recently. Also discourage hand shaking or hugs.	143			
Arrange a mandatory site brief on COVID awareness in the morning. The session must be conducted by the EHS/medical professional.		143		Currently there is no fund provision in DPP in favor of DPHE for EHS/medical professional
While worksites are commonly well ventilated (if not make sure the work sites are well ventilated), ensure that the camp sites including the rooms designated for the camp dwellers are well ventilated and spacious.	143			
Before sharing common tools/machines at worksite, ensure to disinfect.		143		In some instances, it is difficult to avoid situations like use of mixture machine, vibrator machine etc. during construction
Discourage site personnel to gather and gossip at any time, rather encourage physical distance while chatting/discussing.	143			

COVID-19 Response questions	No. of Contracts			Comments
	FC	PC	N/A	
Restrict worksite personnel to go outside unnecessarily. Also restrict campsite personnel to go outside without any valid cause.	143			
If any person related at worksite/campsite fall victim to COVID-19 or being kept isolated for pre-caution, consider paid leave with no exception allowed.			143	No such event has been identified during the reporting tenure
Train workers on how to properly put on, use/wear, and take off protective clothing and equipment. The on-site EHS/Medical person should be in-charge of these trainings. These trainings must maintain the WHO's social distancing protocol. Make these trainings mandatory at worksites. Provide 10-15 minutes of a workday for such 'training and encouragement' activities.		143		Since, there is no fund provision in DPP in favor of DPHE for EHS/medical professional training was not conducted by EHS/medical professional. However, such training has been conducted by SAE/AE of DPHE.

10. Grievance redressal status

A comprehensive grievance redressal system has been developed to address any issues generated due to the construction of wash blocks and installation of water sources in the primary schools. To address such issues, upazilla level GR committee has been formed which is outlined in Table 7. Office of the Assistant Engineer at upazilla level used to receive any grievance originated regarding the construction activities. Despite of the upazilla GR committee there is a designated GR committee in the central level, the detail of which is accessible from DPHE website. Since, no complain were raised from the concerned community, there was no issue of grievance redressal during the reporting tenure.

Table 7 Outline of Upazilla GR Committee, DPHE

Sl. No.	Designation	Work Station	Role	Contact No.
01.	Assistant Engineer	Upazilla Headquarter	Chairman	Concerned Upazilla
02.	Sub-Assistant Engineer	Concerned Upazilla	Member	
03.	Mechanic	Concerned Upazilla	Member	

11. Monitoring progress report

It is fact that environmental screening report is related to the monitoring of implementation progress of environmental and social management plan. During the planning stage, all possible environmental and social safeguard issues are forecasted and related mitigation plans are included in the related contract packages. Issues related to EMP and SMP are clearly indicated in the 'Particular Conditions of Tender and Contract for Water Sources/ Wash Blocks' which is provided by default as a part of tender and contract. Following table shows the monitoring progress report of EMP during the reporting tenure.

Table 8 EMP progress monitoring

Monitoring Criteria	Progress Detail								
	July'18-June'19	July'19-Dec'19	Jan'20-June'20	Jul'20-Dec'20	Jan'21-June'21	July'21-Dec'21	Cumulative	Comment	Compliance Status
No. of contracts that incorporated environmental clause	73/73	11/11	17/17	329/329	922/922	143/143	1495/1495	During tendering, environmental clauses were included which became part of contract	Complied
Funds utilized for addressing safeguards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Currently there is no fund provision in DPP in favor of DPHE for addressing safeguard	N/A
No of schools having dirty environment around water source	6/331	2/57	2/183	42/2145	12/1925	37/527	101/5168	Lac of routine cleanliness caused dirty environment which was mitigated in all 101 schools.	Complied
Schools with drainage congestion identified and solved	2/331	1/57	1/183	19/2145	9/1925	7/527	39/5168	Blockage in drainage system caused drainage congestion which was mitigated in all 39 schools.	Complied
No. of water points having problem with quality of water	0/331	0/57	8/183	13/2145	44/1925	29/527	94/5168	Alternate options such as AIRP, RO, TW in deeper depth were utilized which mitigated the water quality problem in all 94 schools.	Complied

12. Conclusions

This study investigates the environmental safeguard concerns during the implementation of wash blocks, water points and major maintenance of wash blocks based on the approved EMF guidelines for PEDP-4. This report has presented potential environmental impacts associated with the pre-construction, construction and operation phases of the project. The environmental monitoring screening confirmed ***no significant instances or issues*** that may hamper or influence the environmental safety during the reporting tenure. Being an implementing agency DPHE would like to uphold this status in its ongoing and upcoming works related to infrastructure development.

Appendix-1: Sample Environmental Screening for Wash Block

Environmental Screening Report for Wash Block

District: Pirojpur
Upazilla: Nesarabad
Name of School: Rongakathi Govt. Primary School
School ID: 91502060206
Type of Wash Block: Attached

Screening Questions	Base Line		Impact Without Intervention			Impact During Implementation			Impact after Implementation			Remarks
	Yes	No	+	-	N/A	+	-	N/A	+	-	N/A	
Condition of existing toilets Good/Usable?	yes			-				N/A	+			
Are there provisions for safe solid & liquid waste disposal?	yes				N/A			N/A	+			
Are there provisions for hand washing ?	yes			-				N/A	+			
Are there provisions for foot washing?	yes			-				N/A	+			
Does the existing toilets have running water supply?	yes			-				N/A	+			
Is there provision for disabled children?	yes			-				N/A	+			
Are there provisions of adequate urinals in male compartment?	yes			-				N/A	+			
Is there provision for menstrual hygiene in the female compartment?	yes			-				N/A	+			
Are there provisions of separate toilets for male & female users?	yes			-				N/A	+			
Are the existing toilets have adequate ventillation?	yes			-				N/A	+			
Distance of Existing water Source from Soak Pit > 10m	yes			-				N/A	+			
Is there any reported events of sickness?	yes			-				N/A	+			
Any Loss of Agricultural Land?	No				N/A			N/A			0	
Any Negative effect on flora/fauna?	No				N/A			N/A			0	
Are the existing toilets clean and hygienic?	yes			-				N/A	+			

Signature of SAE

Signature of AE

Signature of Executive Engineer

Appendix-2: Sample Environmental Screening for Water Sources

Environmental Screening Report for Water Sources

District: Munshiganj
Upazilla: Munshiganj Sadar
Name of School: Vashan Char Dokkhin Kandi GPS
School ID: 312061106
Type of Water Source: TSP/Ring well/ No. 6 Hand Pump/Others

Screening Questions	Base Line		Impact Without Intervention			Impact During Implementation			Impact after Implementation			Remarks
	Yes	No	+	-	N/A	+	-	N/A	+	-	N/A	
Any Source of existing drinking water?		No			N/A			N/A			N/A	
Environment of water supply facility good?		No			N/A			N/A			N/A	
Facilities for draining out of water proper?		No			N/A			N/A			N/A	
Any reported event of sickness?		No			N/A			N/A			N/A	
Is the existing TW working?		No			N/A			N/A			N/A	
Was the water quality tested?		No			N/A			N/A			N/A	
Are there provisions for water collection basin?	Yes				N/A			N/A			N/A	
Any concern about water quality?		No			N/A			N/A			N/A	
Is there provisions for RO filter?		No			N/A			N/A			N/A	
Any health risk associated?		No			N/A			N/A			N/A	
Distance of existing water source from Soak Well > 10m	Yes				N/A			N/A			N/A	
Height & location of new water source appropriate?	Yes				N/A			N/A			N/A	
Any loss of agricultural land?		No			N/A			N/A			N/A	
Any negative effect on flora/fauna?		No			N/A			N/A			N/A	
Any conflicts with water supply right?		No			N/A			N/A			N/A	

Signature of SAE

(এস এম আব্দুর রহমান)
উপ-সহকারী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর

Signature of Executive Engineer

মোহাম্মদ সাইফুল ইসলাম
নির্বাহী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
মুন্সিগঞ্জ জেলা।

Appendix-3: Sample water quality monitoring by DPHE zonal Lab

Water Quality Test Report
Name of Project: PEDP-4
District: Rajshahi

Sl No		District	Upazilla	Village	ID	Type of School	Water Point		Name of School	GPS		Water Quality			Remarks
							Type	Depth (ft)		N	E	Sand	Clear	As (mg/L)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1154	Rajshahi	Bagha	Chow Madia	113080301O1	1	Pump		Chow Madia	24°9'15"	88°46'14"	1	1	0.001	
2	1155	Rajshahi	Bagmara	Rohiamaamudpur	113070107O3	1	Pump		Rohiamaamudpur	24°38'3"	88°44'8"	1	1	0.043	
3	1156	Rajshahi	Bagmara	Parlia	113070207O2	1	Pump		Parlia	24°31'29"	88°45'8"	1	1	0.021	
4	1157	Rajshahi	Bagmara	Mupai Para	113070504O1	1	Pump		Mupai Para	24°34'25"	88°42'25"	1	1	0.005	
5	1158	Rajshahi	Bagmara	Birkaya	113070702O2	1	Pump		Birkaya	24°37'27"	88°47'37"	1	1	0.003	
6	1159	Rajshahi	Bagmara	Narayanpara	113070908O2	1	Pump		Narayanpara	24°34'20"	88°42'52"	1	1	0.004	
7	1160	Rajshahi	Bagmara	Loupara	113071103O2	1	Pump		Loupara	24°32'40"	88°45'47"	1	1	0.005	
8	1161	Rajshahi	Bagmara	Ransi Bari	113071207O1	1	Pump		Ransi Bari	24°38'25"	88°53'47"	1	1		ND
9	1162	Rajshahi	Bagmara	Phoolpur	113071603O2	1	Pump		Phoolpur	24°40'12"	88°45'57"	1	1	0.027	
10	1163	Rajshahi	Boalia(So	Chandi Pur	113090601O1	1	Pump		Chandi Pur	24°22'14"	88°14'32"	1	1	0.001	
11	1164	Rajshahi	Boalia(So	Gour Hanga	113091802O3	1	Pump		Gour Hanga	24°24'52"	88°16'39"	1	1	0.001	
12	1165	Rajshahi	Boalia(So	Dansh Mari	113092503O1	1	Pump		Dansh Mari	24°22'25"	88°16'11"	1	1	0.001	
13	1166	Rajshahi	Durgapur	Shibpur	113040102O2	1	Pump		Shibpur	24°30'38"	88°45'46"	1	1	0.010	
14	1167	Rajshahi	Durgapur	Amgram	113040403O1	1	Pump		Amgram	24°26'53"	88°43'41"	1	1	0.001	
15	1168	Rajshahi	Durgapur	Andua	113040609O1	1	Pump		Andua	24°24'36"	88°42'56"	1	1	0.001	
16	1169	Rajshahi	Godagari	Kanaidanga-1	113010305O2	1	Pump		Kanaidanga-1	24°28'4"	88°22'20"	1	1	0.001	
17	1170	Rajshahi	Godagari	Golai Lal Mohammad	113010402O2	1	Pump		Golai Lal Mohammad	24°25'6"	88°16'10"	1	1	0.001	
18	1171	Rajshahi	Godagari	Upan Billi	113010908O2	1	Pump		Upan Billi	24°32'40"	88°16'9"	1	1	0.001	
19	1172	Rajshahi	Mohonpur	Chakalam	113100304O2	1	Pump		Chakalam	24°37'18"	88°40'19"	1	1	0.016	
20	1173	Rajshahi	Paba	Horipur	113060401O2	1	Pump		Horipur	24°22'48"	88°30'42"	1	1	0.001	
21	1174	Rajshahi	Puthia	Sayed Pur	113050104O1	1	Pump		Sayed Pur	24°24'30"	88°52'54"	1	1	0.001	
22	1175	Rajshahi	Puthia	Sadgouspara	113050503O8	1	Pump		Sadgouspara	24°30'25"	88°54'5"	1	1	0.001	
23	1176	Rajshahi	Puthia	Sadhan Pur	113050612O1	1	Pump		Sadhan Pur	24°30'41"	88°53'51"	1	1	0.001	
24	1177	Rajshahi	Tanore	Dargadanga	113030313O2	1	Pump		Dargadanga	24°43'9"	88°32'53"	1	1	0.001	
25	1178	Rajshahi	Tanore	Mohor	113030930O1	1	Pump		Mohor	24°42'22"	88°35'6"	1	1	0.001	
26	1179	Rajshahi	Tanore	Sidhair	113030940I02	1	Pump		Sidhair	24°33'34"	88°33'41"	1	1	0.001	
27	1180	Rajshahi	Tanore	Mirapur	113030601O2	1	Pump		Mirapur	24°39'52"	88°35'40"	1	1	0.001	
28	1181	Rajshahi	Tanore	Chalk Provurampur	113030612O2	1	Pump		Chalk Provurampur	24°41'9"	88°35'47"	1	1	0.001	
29	1182	Rajshahi	Godagari	Sadhartipara	113010209O2	1	Pump		Sadhartipara	24°31'13"	88°20'4"	1	1	0.001	
30	1183	Rajshahi	Paba	Kalu Para Madhai Para	113060602O1	1	Pump		Kalu Para Madhai	24°30'60"	88°40'10"	1	1	0.001	

Sample Analyzer

23.12.2021

Md. Abdul Jabbar
Sample Analyzer
DPHE, Zonal Laboratory
Rajshahi.

26.12.21

Senior Chemist

23.12.21

Md. Shafiqul Islam
Senior Chemist
DPHE Zonal Laboratory
Rajshahi.

Appendix-4: Sample water quality monitoring by Field Test Kit

EE, DPHE

Government of the People's Republic of Bangladesh
Arsenic Test at School by Field Kit under Water Quality Monitoring of Fourth Primary Education Development Program (PEDP4)

ARSENIC TEST RESULT BY FIELD KIT

(A) Information of Primary School:

1. Name of School	:	pachim Dhemushia Reg: primary School										
2. EMIS Code	:	4	1	2	0	5	1	2	0	3	0	2
3. District	:	Coxbazar					4. Upazilla :		chakaria			

(B) Information of Drinking Water Source:

1. Provision of Water Sources	:	☑ Yes ☐ No
2. Project	:	☑ PEDP3 ☐ GPS-1 ☐ NNGPS-1 ☐ PEDP-4 ☐ Others
3. Installed By	:	☑ DPHE ☐ Others
4. Year of Installation	:	2017
5. Type of Tube Well	:	☐ Deep ☑ Shallow ☐ Tara ☐ Ring Well ☐ TSP ☐ Others
6. Present Condition	:	☑ Running ☐ Temporary Choked up ☐ Permanently Choked up
7. Platform/Collection Basin Condition	:	☑ Good ☐ Bad ☐ No Platform/Collection Basin.

(C) Water quality & Present status:

Field Observation: (Please √)

☐ ☑ ☐ ☐ ☐ ☐ ☐

Arsenic test Result	:	.....10.....ppb (approx.)	TEST KIT HACH EZ Arsenic Test Kit Cat. No. 28228-00
BDS Standard	:	50 ppb (0.05mg/l)	

For School	For DPHE
Signature & Date:	Signature & Date: 26-12-21
Name: প্রধান শিক্ষিকা (চ: দা:)	Name: মোঃ আবু ইউসুফ
Designation: পশ্চিম ঢেমুশিয়া সরঃ প্রাঃ বিদ্যালয় চকরিয়া, কক্সবাজার।	Designation: উপ-সহকারী প্রকৌশলী জনস্বাস্থ্য প্রকৌশল অধিদপ্তর চকরিয়া, কক্সবাজার।
Phone: 01814-111299	Phone:

[এই পরীক্ষার সাথে বিদ্যালয় কর্তৃপক্ষের কোন আর্থিক সংশ্লেষ নেই। আর্সেনিক পরীক্ষার জন্য সকল খরচ ঠিকাদারী প্রতিষ্ঠান কর্তৃক বহন করা হবে]

Appendix-5: Construction Guidelines by MoLGRD during COVID-19

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
স্থানীয় সরকার, পল্লী উন্নয়ন ও সমবায় মন্ত্রণালয়
স্থানীয় সরকার বিভাগ
পাস-১ অধিশাখা
www.lgd.gov.bd

শেখ হাসিনার মূলনীতি
গ্রাম শহরের উন্নতি

স্মারক নং-৪৬.০০.০০০০.০৮৩.১২.০০২.১৭(অংশ-২)-১৬২৯

তারিখঃ ২৪ বৈশাখ ১৪২৭ / ০৭ মে ২০২০

বিষয়ঃ জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কর্তৃক বাস্তবায়নাধীন প্রকল্পের কাজ সম্পাদনের জন্য অনুসরণীয় নির্দেশনা।

সূত্রঃ জনপ্রশাসন মন্ত্রণালয়ের প্রজ্ঞাপন নং- ০৫.০০.০০০০.১৭৩.০৮.০১৪.০৭-১৩৫, তারিখ: ০৪ মে ২০২০।

উপর্যুক্ত বিষয় ও সূত্রোস্থ পত্রের প্রেক্ষিতে নির্দেশক্রমে জানানো যাচ্ছে যে, জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কর্তৃক বাস্তবায়নাধীন প্রকল্পের কাজ সম্পাদনের জন্য নিম্নবর্ণিত নির্দেশনা অনুসরণ করতে হবেঃ

০১) প্রকল্প এলাকায় করোনা ভাইরাস (কভিড-১৯) বিষয়ক স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয় কর্তৃক জারিকৃত নির্দেশনা সম্বলিত সাইনবোর্ড স্থাপন করতে হবে;

০২) স্বাস্থ্য বিধি অনুসরন ও সামাজিক দূরত্ব রক্ষা করে প্রকল্পের কাজ সম্পাদন করতে হবে। প্রকল্প কাজে যে সকল শ্রমিক কাজ করবে তারা শারীরিকভাবে সুস্থ কি-না তা নির্ণয়ের জন্য থার্মাল স্ক্যানারের মাধ্যমে তাদের শরীরের তাপমাত্রা পরীক্ষা করতে হবে;

০৩) ট্রাকে করে নির্মাণ সামগ্রী পরিবহন/সরবরাহের সময় ট্রাকের সামনে ব্যানারে জনস্বাস্থ্য প্রকৌশল অধিদপ্তর কর্তৃক বাস্তবায়নাধীন সুনির্দিষ্ট প্রকল্পের নাম উল্লেখ থাকতে হবে;

০৪) প্রকল্প কাজ সম্পাদনের জন্য শ্রমিকদের নির্দিষ্ট পোশাক পরিধান করতে হবে এবং প্রযোজ্য ক্ষেত্রে মাস্ক, হ্যান্ডগ্লোভস, গামবুট, হেলমেট ব্যবহার করতে হবে;

০৫) প্রকল্প এলাকায় নির্মাণ শ্রমিকদের জন্য সাবান পানি দিয়ে হাত ধোয়ার ব্যবস্থা থাকতে হবে। প্রয়োজনে হ্যান্ড স্যানিটাইজার সরবরাহ করতে হবে;

০৬) চলমান প্রকল্প এলাকায় কার্যক্রম চলাকালীন কাজের বিবরণ সম্বলিত সাইনবোর্ড স্থাপন করতে হবে;

০৭) প্রকল্প কাজে নির্মাণ সংশ্লিষ্ট যন্ত্রপাতি ব্যবহারের ক্ষেত্রে স্বাস্থ্য সুরক্ষার বিষয়টি নিশ্চিত করতে হবে;

০৮) প্রকল্প কাজে নিয়োজিত নির্মাণ শ্রমিকদের স্বাস্থ্য বিধি অনুসরণপূর্বক সামাজিক দূরত্ব বজায় রেখে নির্ধারিত নির্মাণ শেডে অবস্থান করতে হবে;

০৯) পাথর, সিমেন্ট বা অন্যান্য নির্মাণ সামগ্রী এক জেলা হতে অন্য জেলায় পরিবহনের প্রয়োজন হলে সংশ্লিষ্ট জেলা প্রশাসকগণকে অবহিত করতে হবে;

১০) প্রযোজ্য ক্ষেত্রে প্রকল্পের কাজ চালানোর জন্য সংশ্লিষ্ট জেলা প্রশাসক/উপজেলা নির্বাহী অফিসারের অনুমতি গ্রহণ করতে হবে;

অপর পৃষ্ঠায় দ্রষ্টব্য-

-০২-

১১) উল্লিখিত নির্দেশনা যথাযথভাবে অনুসরণ করা হচ্ছে কিনা তা মাঠ পর্যায়ে তদারকির জন্য জনস্বাস্থ্য প্রকৌশল অধিদপ্তর একটি কমিটি গঠন করবে। কমিটি প্রতি মাসে স্থানীয় সরকার বিভাগ বরাবর প্রতিবেদন দাখিল করবে।

১২) ঈদ-উল-ফিতরের সরকারি ছুটিতে সকল কর্মকর্তা-কর্মচারীকে তার স্ব-স্ব কর্মস্থলে অবস্থান করতে হবে।

মো: খাইরুল ইসলাম
যুগ্মসচিব
ফোন: ৯৫৭৫৫৬২

প্রধান প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
কাকরাইল, ঢাকা।

স্মারক নং-৪৬.০০.০০০০.০৮৩.১২.০০২.১৭(অংশ-২)- ১৬২৯/০১(০৮)

তারিখঃ ২৪ বৈশাখ ১৪২৭ / ০৭ মে ২০২০

অনুলিপি (সদয় অবগতির জন্য)

১. অতিরিক্ত সচিব (পাস), স্থানীয় সরকার বিভাগ।
২. বিভাগীয় কমিশনার (সকল), ... বিভাগ।
৩. মাননীয় মন্ত্রীর একান্ত সচিব, স্থানীয় সরকার পল্লী উন্নয়ন ও সমবায় মন্ত্রণালয়।
৪. জেলা প্রশাসক (সকল), ... জেলা।
৫. উপসচিব, বিধি-৪ শাখা, জনপ্রশাসন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৬. সিনিয়র সচিবের একান্ত সচিব, স্থানীয় সরকার বিভাগ।
৭. কম্পিউটার প্রোগ্রামার, স্থানীয় সরকার বিভাগ।
৮. অফিস কপি।

মো: খাইরুল ইসলাম
যুগ্মসচিব

Appendix-6: Water Quality Report of Unacceptable Water Sources

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Government of the People's Republic of Bangladesh
Office of the Senior Chemist
Department of Public Health Engineering (DPHE)
Bogra Zonal Lab, Seojgari, Jamtola, Bogra.
Phone: 051-78295, Fax: , Email: wqmsc_bograzonallab@yahoo.com

Memo:46.03.1000.106.16.01.21.220 Date:07/11/2021

Physical/Chemical/Bacteriological Analysis of Water Sample

Sample ID: BOG2021110101 to BOG2021110115, Total: 15	District: Gaibandha; Upazila: Sundarganj
Sent by: Sub-assistant Engineer, DPHE, Sundarganj, Gaibandha.	Sample Source: STW-Others Pump
Ref. Memo No: 46.03.3291.401.14.001.21-27 & Dated: 30/09/2021 PN: TSP-PEDP-4/0350 TID:565261	Date of Testing: 31/10/2021 & 03/11/2021
Collection date: 25/10/2021 & 26/10/2021	Receiving date: 27/10/2021

LABORATORY TEST RESULTS:

Sample ID	Name Of School	ID	Global Position(GPS)		Arsenic (mg/L) LOQ:0.001, BDS:0.05		Chloride (mg/L) LOQ:1, BDS:150-600		Iron (mg/L) LOQ:0.1, BDS:0.3-1	
			Latitude	Longitude	Conc.	Method	Concl.	Method	Concl.	Method
BOG2021110101	Moddo Shebram GPS	99108070201	25°33'20"	89°28'22"	0.002	AAS	32	Titrimetric	3.4	AAS
BOG2021110102	Taluk Sorbanondo GPS	91108071706	25°30'00"	89°28'44"	0.021	AAS	28	Titrimetric	1.6	AAS
BOG2021110103	Kesamot Dhopdanga GPS	108071307	25273'11"	89°29'58"	0.063	AAS	26	Titrimetric	6.8	AAS
BOG2021110104	Dhopdanga GPS	108071304	25°27'15"	89°30'29"	0.040	AAS	32	Titrimetric	3.5	AAS
BOG2021110105	Hatia Cowrasta GPS	99108070801	25°28'47"	89°30'25"	0.040	AAS	36	Titrimetric	23	AAS
BOG2021110106	Char Coritabari GPS	99108070406	25°34'27"	89°28'20"	0.023	AAS	30	Titrimetric	10	AAS
BOG2021110107	Gidar Hola GPS	91108071414	25°27'42"	89°36'31"	0.039	AAS	24	Titrimetric	3.0	AAS
BOG2021110108	Porom Sorjan GPS	99108071204	25°29'19"	89°35'04"	0.027	AAS	32	Titrimetric	0.8	AAS
BOG2021110109	Notun Dulal Vorot GPS	91108070356	25°27'19"	89°36'36"	0.039	AAS	30	Titrimetric	1.7	AAS
BOG2021110110	Bojan GPS	91108070207	25°26'29"	89°37'12"	0.053	AAS	30	Titrimetric	12	AAS
BOG2021110111	Chanmari GPS	99108071303	25°25'42"	89°36'57"	0.010	AAS	34	Titrimetric	0.6	AAS
BOG2021110112	Shes -1 on GPS	108070102	25°28'32"	89°38'06"	0.045	AAS	28	Titrimetric	1.5	AAS
BOG2021110113	Chondipur-2 on GPS	108071415	25°28'54"	89°37'54"	0.043	AAS	28	Titrimetric	8.3	AAS
BOG2021110114	Chondipur GPS	91108070101	25°29'37"	89°37'53"	0.062	AAS	24	Titrimetric	13	AAS
BOG2021110115	Lal camar GPS	10807140201	25°27'57"	89°38'03"	0.053	AAS	36	Titrimetric	8.5	AAS

Note: Sample Collected by Md. Atikul Islam. LOQ-Level On Quantization, BDS: Bangladesh Standard, AAS: Atomic Absorption Spectrophotometer, UVS: Ultra Violet Spectrophotometer. Lab SI: 5642-5656

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Md. Hafizur Rahman Designation: Sample Analyzer	07/11/2021 Md. Hafizur Rahman Sample Analyzer	1.) Name: Md. Sohel Rana Designation: Senior Chemist	07.11.2021 Md. Sohel Rana Senior Chemist
2.) Name: Designation:		2.) Name: Designation:	

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Government of the People's Republic of Bangladesh
Office of the Senior Chemist
Department of Public Health Engineering (DPHE)
Bogra Zonal Lab, Seojgari, Jamtola, Bogra.
Phone: 051-78295, Fax: , Email: wqmsc_bograzonallab@yahoo.com

Memo:46.03.1000.106.16.01.21.218 Date:07/11/2021

Physical/Chemical/Bacteriological Analysis of Water Sample

Sample ID: BOG2021090561 to BOG2021090570, Total: 10	District: Gaibandha ; Upazila: Saghata
Sent by: Assistant Engineer, DPHE, Saghata, Gaibandha.	Sample Source: STW-Others Pump
Ref. Memo No: 46.203.3288.301.16.001.21-20 & Dated: 30/09/2021	Date of Testing: 31/10/2021 & 03/11/2021
Collection date: 07/10/2021	Receiving date: 10/10/2021

LABORATORY TEST RESULTS:

Sample ID	Name Of School	ID	Global Position(GPS)		Arsenic (mg/L) LOQ:0.001, BDS:0.05		Chloride (mg/L) LOQ:1, BDS:150-600		Iron (mg/L) LOQ:0.1, BDS:0.3-1	
			Latitude	Longitude	Conc.	Method	Conct.	Method	Conct.	Method
BOG2021090561	Gota GPS	91108060204	25°12'21"	89°34'10"	0.057	AAS	32	Titrimetric	8.1	AAS
BOG2021090562	Vorokhali GPS	91108060203	25°11'13"	89°34'55"	0.014	AAS	28	Titrimetric	6.6	AAS
BOG2021090563	Pachpir GPS	91108060612	25°13'54"	89°31'18"	0.017	AAS	30	Titrimetric	0.4	AAS
BOG2021090564	Shimultair GPS	99706069004	25°09'34"	89°31'27"	<LOQ	AAS	34	Titrimetric	2.3	AAS
BOG2021090565	Dhonaruha GPS	91108060401	25°09'35"	89°34'02"	0.021	AAS	22	Titrimetric	1.8	AAS
BOG2021090566	Bonarpara Model GPS	91108061001	25°10'56"	89°31'40"	0.008	AAS	28	Titrimetric	1.4	AAS
BOG2021090567	Jumarbai GPS	91108060821	25°13'42"	89°33'49"	0.002	AAS	26	Titrimetric	1.4	AAS
BOG2021090568	Amdirpara GPS	91108060837	25°14'24"	89°33'27"	0.021	AAS	30	Titrimetric	5.5	AAS
BOG2021090569	Saghata GPS	91108060301	25°06'27"	89°35'07"	0.008	AAS	28	Titrimetric	1.3	AAS
BOG2021090570	Poschim Pobontair GPS	99108060601	25°10'04"	89°40'06"	0.003	AAS	32	Titrimetric	4.9	AAS

Note: Sample Collected by Md. Shihab Uddin. LOQ-Level On Quantization, BDS: Bangladesh Standard, AAS: Atomic Absorption Spectrophotometer, UVS: Ultra Violet Spectrophotometer. Lab Sl: 3077-3086

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Md. Hafizur Rahman Designation: Sample Analyzer	07/11/2021	1.) Name: Md. Sohel Rana Designation: Senior Chemist	07/11/2021
2.) Name: Designation:		2.) Name: Designation:	

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Government of the People's Republic of Bangladesh
Office of the Senior Chemist
Department of Public Health Engineering (DPHE)
Bogra Zonal Lab, Seojgari, Jamtola, Bogra.
Phone: 051-78295, Fax: , Email: wqmsc_bograzonallab@yahoo.com

Memo:46.03.1000.106.16.01.21.219

Date:07/11/2021

Physical/Chemical/Bacteriological Analysis of Water Sample

Sample ID: BOG2021090571 to BOG2021090585, Total: 15	District: Gaibandha ; Upazila: Polashbari
Sent by: Sub-assistant Engineer, DPHE, Polashbari, Gaibandha.	Sample Source: STW-Others Pump
Ref. Memo No: 46.03.3267.401.16.26.18-12 & Dated: 28/09/2021	Date of Testing: 31/10/2021 & 03/11/2021
Collection date: 25/10/2021 & 26/10/2021	Receiving date: 27/10/2021

LABORATORY TEST RESULTS:

Sample ID	Name Of School	ID	Global Position(GPS)		Arsenic (mg/L) LOQ:0.001, BDS:0.05		Chloride (mg/L) LOQ:1, BDS:150-600		Iron (mg/L) LOQ:0.1, BDS:0.3-1	
			Latitude	Longitude	Conc.	Method	Conct.	Method	Conct.	Method
BOG2021090571	Malendoho GPS	108030701	25°15'43"	89°25'56"	0.055	AAS	28	Titrimetric	6.5	AAS
BOG2021090572	Balbamunia Girls GPS	708030703	25°15'24"	89°27'18"	0.012	AAS	32	Titrimetric	1.5	AAS
BOG2021090573	Balbamunia Purbopara GPS	99708039029	25°15'23"	89°27'17"	0.037	AAS	26	Titrimetric	0.4	AAS
BOG2021090574	Hasbari GPS	108030208	25°13'55"	89°21'01"	0.015	AAS	22	Titrimetric	2.1	AAS
BOG2021090575	Barishal GPS	91908030410	25°14'40"	89°23'52"	0.003	AAS	28	Titrimetric	0.4	AAS
BOG2021090576	Goalpara GPS	108030510	25°17'19"	89°24'53"	0.001	AAS	22	Titrimetric	0.1	AAS
BOG2021090577	Borogobindapur GPS	108030516	25°16'38"	89°24'08"	<LOQ	AAS	26	Titrimetric	0.3	AAS
BOG2021090578	Uttar Sabdin GPS	108030404	25°15'24"	89°24'44"	0.001	AAS	30	Titrimetric	3.2	AAS
BOG2021090579	Horinabari 1no GPS	108030906	25°14'24"	89°29'02"	0.069	AAS	30	Titrimetric	<LOQ	AAS
BOG2021090580	Shimulia GPS	108030106	25°15'18"	89°21'14"	0.018	AAS	22	Titrimetric	<LOQ	AAS
BOG2021090581	Shimulia 2no GPS	108030129	25°17'25"	89°20'51"	0.006	AAS	28	Titrimetric	0.3	AAS
BOG2021090582	Satarpara GPS	91108030609	25°18'04"	89°28'04"	0.060	AAS	24	Titrimetric	0.4	AAS
BOG2021090583	Monohorpur 1no GPS	108030807	25°16'50"	89°29'57"	0.015	AAS	26	Titrimetric	1.2	AAS
BOG2021090584	Khamar Batua GPS	91108030812	25°15'03"	89°29'22"	<LOQ	AAS	32	Titrimetric	1.4	AAS
BOG2021090585	Taluk Ghorabanda GPS	91108030802	25°16'12"	89°27'34"	0.006	AAS	28	Titrimetric	2.4	AAS

Note: Sample Collected by Md. Shihab Uddin. LOQ-Level On Quantization, BDS: Bangladesh Standard, AAS: Atomic Absorption Spectrophotometer, UVS: Ultra Violet Spectrophotometer. Lab Sl: 3087-3101

Test Performed by:	Signature	Countersigned/Approved by:	Signature
1.) Name: Md. Hafizur Rahman Designation: Sample Analyzer	07/11/2021 Md. Hafizur Rahman Sample Analyzer DPHE, Zonal Laboratory, Bogra.	1.) Name: Md. Sohel Rana Designation: Senior Chemist	07.11.2021 Md. Sohel Rana Senior Chemist DPHE, Zonal Laboratory, Bogra.
2.) Name: Designation:		2.) Name: Designation:	

Government of the People's Republic of Bangladesh
Office of the Senior Chemist
Department of Public Health Engineering (DPHE)
Bogra Zonal Lab, Seojgari, Jamtola, Bogra.
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Memo:46.03.1000.106.16.01.21.230 Date:10/11/2021

Physical/Chemical/Bacteriological Analysis of Water Sample

Sample ID: BOG2021110116 to BOG2021110130, Total: 15	District: Gaibandha; Upazila: Gobindaganj
Sent by: Sub-assistant Engineer, DPHE, Gobindaganj, Gaibandha.	Sample Source: STW-Others Pump
Ref. Memo No: 46.03.3230.401.14.014.21-289 & Dated: 28/09/2021 PN: TSP-PEDP-4/0349 TID:565264	Date of Testing: 09/11/2021 & 10/11/2021
Collection date: 06/11/2021 & 08/11/2021	Receiving date: 09/11/2021

LABORATORY TEST RESULTS:

Sample ID	Name Of School	ID	Global Position(GPS)		Arsenic (mg/L) LOQ:0.001, BDS:0.05		Chloride (mg/L) LOQ:1, BDS:150-600		Iron (mg/L) LOQ:0.1, BDS:0.3-1	
			Latitude	Longitude	Conc.	Method	Conct.	Method	Conct.	Method
BOG2021110116	Beurgram GPS	91108020403	25°07'01"	89°15'10"	0.040	AAS	30	Titrimetric	2.3	AAS
BOG2021110117	Puyagari GPS	108020103	25°11'44"	89°12'21"	0.020	AAS	34	Titrimetric	2.7	AAS
BOG2021110118	Kaltola GPS	108021203	25°07'14"	89°20'09"	0.023	AAS	28	Titrimetric	4.1	AAS
BOG2021110119	Maladhor GPS	91108021103	25°10'12"	89°25'17"	0.052	AAS	28	Titrimetric	4.5	AAS
BOG2021110120	Bogulagari GPS	108020613	25°11'35"	89°18'57"	0.025	AAS	36	Titrimetric	1.7	AAS
BOG2021110121	Shakpala GPS	91108021102	25°09'45"	89°22'39"	0.224	AAS	26	Titrimetric	8.4	AAS
BOG2021110122	Chadpur Singa GPS	708020003	25°09'51"	89°26'06"	0.042	AAS	32	Titrimetric	0.7	AAS
BOG2021110123	Polashbari GPS	108021006	25°08'39"	89°25'47"	0.057	AAS	30	Titrimetric	2.9	AAS
BOG2021110124	Khirpari GPS	108021502	25°06'29"	89°26'24"	0.061	AAS	32	Titrimetric	0.9	AAS
BOG2021110125	Thikana Sholodol GPS	108021202	25°08'11"	89°18'12"	0.017	AAS	28	Titrimetric	1.1	AAS
BOG2021110126	Hosenpur GPS	108020501	25°14'24"	89°21'52"	0.036	AAS	28	Titrimetric	0.8	AAS
BOG2021110127	Uttar Popgoil GPS	108020608	25°12'40"	89°26'39"	0.295	AAS	34	Titrimetric	4.2	AAS
BOG2021110128	Bondhonkuthi GPS	108021104	25°07'48"	89°25'56"	0.066	AAS	30	Titrimetric	1.3	AAS
BOG2021110129	Shalmara GPS	91108021702	25°04'06"	89°29'28"	0.074	AAS	28	Titrimetric	0.8	AAS
BOG2021110130	Taluk kanupur GPS	91108020701	25°12'17"	89°24'11"	0.234	AAS	32	Titrimetric	2.1	AAS

Note: Sample Collected by Md. Shihab Uddin LOQ-Level On Quantization, BDS: Bangladesh Standard, AAS: Atomic Absorption Spectrophotometer, UVS: Ultra Violet Spectrophotometer. Lab Sl: 5657-5671

Test Performed by:

Name: Md. Alauddin Al Faruque
Designation: Junior Chemist
Signature 10.11.2021

Name: Md. Hafizur Rahman
Designation: Sample Analyzer
10/11/2021

Countersigned/Approved by:

1.) Name: Md. Sohel Rana
Designation: Senior Chemist
Signature 10.11.2021

2.) Name:
Designation:

Government of the People's Republic of Bangladesh
Department of Public Health Engineering (DPHE)
Office of the Senior Chemist
Zonal Laboratory, Comilla
Water Testing Results of PEDP-4 Project

Sl No	District	Upazilla	Union	Village	School ID	School Type	Name of school	GPS Reading	Water Quality			
									Sand	Clear	As (mg/L)	Fe (mg/L)	Cl (mg/L)
1	Cumilla	Debidwar	Sultanpur	Sultanpur	406031405	PEDP-4	Sultanpur GPS	23°30'32" 90°59'06"	N	Y	0.003	34.59	665
2	Cumilla	Debidwar	Borkamta	Borkamta	406090506	PEDP-4	Borkamta GPS	23°29'57" 91°11'80"	N	Y	0.011	3.12	48

Samples were collected by Borhan Uddin, Lab Assistant, DPHE Zonal Lab Cumilla.

15/11/'21
SACHCHIDA NANDA DAS
Superintending Engineer
Department of Public Health Engineering (DPHE)
Zonal Laboratory, Cumilla

15/11/'21
SHARMIN SULTANA
Junior Chemist
DPHE Zonal Lab Cumilla

15/11/2021
KANAI LAL DAS
Junior Chemist
DPHE Zonal Lab, Comilla

Government of the People's Republic of Bangladesh
Department of Public Health Engineering (DPHE)
Office of the Senior Chemist
Zonal Laboratory, Comilla
Water Testing Results of NNGPS Project

Sl No	District	Upazilla	Union	Village	School ID	School Type	Name of school	GPS Reading	Water Quality			
									Sand	Clear	As (mg/L)	Fe (mg/L)	Cl (mg/L)
1	Cumilla	Debidwar	Dakkhin Gunaighor	Goneshpur	406039202	NNGPS	Goneshpur GPS	23°33'59" 90°58'41"	N	Y	0.003	19.14	665
2	Cumilla	Debidwar	Sultanpur	Surpur	406090302	NNGPS	Surpur GPS	23°30'22" 90°58'01"	N	Y	0.002	4.29	532
3	Cumilla	Debidwar	Eusufpur	Juktagram	406080801	NNGPS	Juktagram GPS	23°39'15" 91°02'34"	N	Y	0.003	2.44	38
4	Cumilla	Debidwar	Mohorpur	Baura	406039203	NNGPS	Baura GPS	23°32'21" 91°01'40"	N	Y	0.003	0.90	209
5	Cumilla	Debidwar	Fatehabad	Kamarchor	406090505	NNGPS	Kamarchor GPS	23°36'43" 91°01'50"	N	Y	0.004	2.50	162
6	Cumilla	Debidwar	Debidwar	Vosona	406030501	NNGPS	Vosona A.R.Khan GPS	23°27'49" 91°14'25"	N	Y	0.001	4.28	409

Samples were collected by Borhan Uddin, Lab Assistant, DPHE Zonal Lab Cumilla.

SAKHICHANDRA DAS
Samples Analyzer
Department of Public Health Engineering (DPHE)
Zonal Laboratory, Cumilla.

15/11/'21
SHARMIN SULTANA
Junior Chemist
DPHE Zonal Lab, Cumilla.

15/11/2021
KANAI LAL DAS
Junior Chemist
DPHE Zonal Lab, Cumilla.

Government of The People's Republic of Bangladesh
Office of the Senior Chemist
Department of Public Health Engineering (DPHE)
Zonal Laboratory, Rangpur.

Water Test Report of PEDP-4 Project

Sl. No	District	Upazila	Village	School ID	Water point		Name of School	Global Positioning System (GPS)		Water Quality				Re
					Type of School	Depth (m)		Latitude	Longitude	Sand	Clear	As (mg/L)	Fe (mg/L)	Cl (mg/L)	
1	Rangpur	Mithapukur	Dmaipur Tahola	991050571707	01	TSP	-	Imadpur Tahola GPS	25°31'14"	89°24'28"	01	01	-	6.5	-	
2	Rangpur	Mithapukur	Jogoda Nandapur	997050790113	01	TSP	-	Jogoda Nandapur GPS	25°16'59"	89°21'38"	01	01	-	6.0	-	

BDS: Bangladesh Drinking Standard (Fe=0.3-1.0 mg/L) LAB ID: 105, Work Order: 1087, Tender ID: 517693, Package no-TSP-PEDP-4/14, Sample Collected by Md. Humayun Kabir, Sample Analyzer.

29.09.21
Md. Humayun Kabir
Sample Analyzer
DPHE, Zonal Lab, Rangpur.

29.9.21
Md. Abdul Jabbar
Senior Chemist
DPHE, Zonal Lab, Rangpur.

29.9.21
Md. Abdul Jabbar
Senior Chemist
DPHE, Zonal Lab, Rangpur

Memo: 46.03.8500.106.16.004.21.164 **Date: 29 / 09 / 2021**

CC:

01. Project Director & Focal Point, PEDP-4, DPHE, Dhaka.
02. Executive Engineer, DPHE, Rangpur Division, Rangpur.
03. Sub-Asst. Engineer, DPHE, Mithapukur, Rangpur. Ref: Office Memo: 46.03.8558.401.14.078.18-22, Date: 29/08/2021

Date :06/06/2021

Sl. No	District	Upazila	Name of School	EMIS CODE	Package Number	No of TSP in a Package	Date of contract sign (dd/mm/yy)	Name of contractor	Contract amount (lac)	Physical Progress (%)	Bill Paid Amount (lac)	Completion Due Date (dd/mm/yy)	Actual Completion Date (dd/mm/yy)	Water Quality		
														As	Fe	Cl
1	Rajshahi	BAGMARA	ALOKNAGOR DANGGAPARA RPS	99113071406	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	8/1/2020	0.007	0.6	10
2	Rajshahi	BAGMARA	ARUJNPARA RPS	99113071401	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/8/2020	0.003	0.5	10
3	Rajshahi	BAGMARA	BALAI PARA	91113071509	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/11/2020	0.003	0.4	15
4	Rajshahi	BAGMARA	BALIA Govt. Primary School	91113071002	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/21/2020	0.003	0.4	15
5	Rajshahi	BAGMARA	BARUHATI RPS	99113071502	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/15/2020	0.021	1	20
6	Rajshahi	BAGMARA	BARUI PARA-1 GOVERNMENT PRIMARY	91113071206	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/14/2020	0.002	1.9	44
7	Rajshahi	BAGMARA	BOHLOPARA RPS	99113071201	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/14/2020	0.006	0.4	20
8	Rajshahi	BAGMARA	BHABANI GONJ	91113070903	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	9/3/2020	0.021	1	20
9	Rajshahi	BAGMARA	BHAGNADI	91113071501	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/28/2020	0.021	2	10
10	Rajshahi	BAGMARA	BHATGHORPARA RPS	99113071503	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/27/2020	0.003	2.8	40
11	Rajshahi	BAGMARA	BIR KUTSHA	91113071507	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/21/2020	0.005	1	25
12	Rajshahi	BAGMARA	Jagara	113070506	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/9/2020	0.066	5.3	30
13	Rajshahi	BAGMARA	BISHU PARA	91113070406	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	0/07/20	0.014	3.4	32
14	Rajshahi	BAGMARA	BOKURI RPS	99113070903	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/13/2020	0.002	1.1	20
15	Rajshahi	BAGMARA	BON GRAM	91113071503	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/17/2020	0.012	0.4	35
16	Rajshahi	BAGMARA	CHAI PARA	91113070608	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/29/2020	0.074	2.6	18
17	Rajshahi	BAGMARA	CHASARA NON-GOVT. PRIMARY SCHOOL	99113079202	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/5/2020	0.101	1.8	16
18	Rajshahi	BAGMARA	CHANPARA NON-GOVT. PRIMARY SCHOOL	99113079201	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/20/2020	0.002	1.2	20
19	Rajshahi	BAGMARA	CHEW KHALI	91113071301	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/13/2020	0.004	0.4	12
20	Rajshahi	BAGMARA	DEWLIA	91113070702	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/17/2020	0.001	0.7	20
21	Rajshahi	BAGMARA	GONGGOPARA RPS	99113071004	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/1/2020	0.001	0.5	16
22	Rajshahi	BAGMARA	GOUR SHAR	91113070204	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/27/2020	0.001	0.2	20
23	Rajshahi	BAGMARA	HATIRUM GOVT. PRIMARY SCHOOL	99113070103	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/8/2020	0.087	5.4	15
24	Rajshahi	BAGMARA	JAMAL PUR	91113071107	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/16/2020	0.001	0.3	68
25	Rajshahi	BAGMARA	KALIKA PUR	91113070903	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/12/2020	0.001	1.9	16
26	Rajshahi	BAGMARA	KANO PARA	91113071306	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	24/07/02020	0.002	0.4	25
27	Rajshahi	BAGMARA	KANTHAL BARI	91113071003	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/29/2020	0.004	2.3	50
28	Rajshahi	BAGMARA	KASARI KOALIPARA RPS	99113070802	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/10/2020	0.002	1.9	22
29	Rajshahi	BAGMARA	KASIBA RPS	99113070806	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/11/2020	0.009	6.5	10
30	Rajshahi	BAGMARA	KASIBA SADIPUR RPS	99113070805	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/28/2020	0.003	0	20

31	Rajshahi	BAGMARA	KASTA NANGLA	9111307020	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/2/2020	0.001	2.1	18	
32	Rajshahi	BAGMARA	KATILA	9111307150	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/17/2020	0.001	0.7	15	
33	Rajshahi	BAGMARA	KHALIMPUR RPS	9911307111	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/25/2020	0.017	0.1	10	
34	Rajshahi	BAGMARA	KHAPUR RPS	9911307140	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/17/2020	0.002	4.5	10	
35	Rajshahi	BAGMARA	KHAYERA	9111307070	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/5/2020	0.001	0.1	22	
36	Rajshahi	BAGMARA	KHOARA RPS	9911307011	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/27/2020	0.021	1.1	30	
37	Rajshahi	BAGMARA	KONARARIA (S) RPS	9911307140	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/24/2020	0.012	2	15	
38	Rajshahi	BAGMARA	KUU BARI	9111307040	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/29/2020	0.003	2.6	45	
39	Rajshahi	BAGMARA	LARUPARA RPS	9911307900	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/22/2020	0.016	3.2	35	
40	Rajshahi	BAGMARA	MENDI PARA	9111307060	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/19/2022	0.004	0.1	12	
41	Rajshahi	BAGMARA	MOHAMMAD PUR	9111307070	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/15/2020	0.002	2.6	30	
42	Rajshahi	BAGMARA	NAGPARA	9111307158	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/27/2020	0.001	0.8	40	
43	Rajshahi	BAGMARA	NAZIRPUR RPS	9911307080	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/5/2020	0.042	0.6	15	
44	Rajshahi	BAGMARA	NECHUKATALIA RPS	9911307150	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/5/2020	0.005	0.7	22	
45	Rajshahi	BAGMARA	NOKHO PARA	9111307150	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/16/2020	0.008	0.6	50	
46	Rajshahi	BAGMARA	NORDASH	9111307020	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/29/2020	0.099	2.2	16	
47	Rajshahi	BAGMARA	RAM RAMA	9111307130	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/9/2020	0.001	0.4	16	
48	Rajshahi	BAGMARA	SENGPARA RPS	9911307900	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/18/2020	0.002	0.4	25	
49	Rajshahi	BAGMARA	SIMON KHOIA	9111307100	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/9/2020	0.008	1.2	25	
50	Rajshahi	BAGMARA	BOISHINHO	9111307100	TW-0111	50	18/05/2020	Sha Alamgir	1.66	80%	1.28	30-11-2020	7/18/2020	0.002	1.1	20	

Date :06/06/2021

Sl. No	District	Upazila	Name of School	EMIS CODE	Package Number	No of TSP in a Package	Date of contract sign (dd/mm/yy)	Name of contractor	Contract amount (lac)	Physical Progress (%)	Bill Paid Amount (lac)	Completion Due Date (dd/mm/yy)	Water Quality		
													AS	Fe	Cl
1	Rajshahi	Bagha	Bajibagha Govt primary Scho	91113080504	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.004	0.1	20
2	Rajshahi	Bagha	BEL GACHI DHAKA CHANRON	91113080505	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.006	0.1	15
3	Rajshahi	Bagha	Chandipur Govt Primary Scho	91113080506	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.005	0.1	12
4	Rajshahi	Bagha	Bagha Model Govt Primary Sc	91113080513	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.002	0.1	40
5	Rajshahi	Bagha	Jotcraghob Alauddin	91113080507	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.013	3.3	15
6	Rajshahi	Bagha	Bug Shamsta Govt Primary Sch	91113080508	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.001	0.1	12
7	Rajshahi	Bagha	Satari Govt Primary School	91113080503	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.003	0.1	10
8	Rajshahi	Bagha	Balihar Govt Primary School	91113080606	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.004	0.1	15
9	Rajshahi	Bagha	Bara Khadia RPS	99113080102	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.002	0.1	10
10	Rajshahi	Bagha	Nawtika Govt Primary School	99113080103	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.001	0.2	15
11	Rajshahi	Bagha	Hazrat Sha Abbas Govt Primar	99113080107	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.018	0.1	15
12	Rajshahi	Bagha	Tagurkuria RPS	99113089003	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.045	5	15
13	Rajshahi	Bagha	Dadpur Govt Primary School	91113080201	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.003	0.1	10
14	Rajshahi	Bagha	Chandpur RPS	91113080202	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.004	1.4	20
15	Rajshahi	Bagha	Sultanpur RPS	99113080204	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.001	0.1	17
16	Rajshahi	Bagha	Chak Enaet GPS	99113080205	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.041	1.2	16
17	Rajshahi	Bagha	Khairahat RPS	99113080201	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.021	1.9	40
18	Rajshahi	Bagha	Alaipur RPS	99113080302	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.003	0.1	15
19	Rajshahi	Bagha	Jotnashi RPS	91113080304	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.005	0.2	15
20	Rajshahi	Bagha	Kroboipur Govt Primary Sch	91113080307	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.018	0.1	50
21	Rajshahi	Bagha	Helalpur RPS	99113080401	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.002	0.1	22
22	Rajshahi	Bagha	Mahodipur RPS	99113080402	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.002	0.1	20
23	Rajshahi	Bagha	Hartrampur GPS	91113080602	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.019	0.4	20
24	Rajshahi	Bagha	Bonodpur GPS	91113080603	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.018	0.4	30
25	Rajshahi	Bagha	Habashpur GPS	91113080604	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.004	0.1	30
26	Rajshahi	Bagha	Aghori GPS	91113080607	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.013	0.1	35
27	Rajshahi	Bagha	Moulgram GPS	91113080605	TW-0110	50	17/05/2020	Sha Alamgir	1.66	80%	1.16	30-11-2020	0.002	0.1	27

Table 1 - List of Unacceptable Water Sources where mitigation measures were considered

SL No	District Name	Upazila Name	Name Of School	School ID	Test Result			Remark	Suggested Option	After intervention		
					As	Fe	Cl			As	Fe	Cl
1	Gaibandha	Sundarganj	Nesamot Dhopdanga GPS	108071307	0.063	6.8	26	not acceptable	AIRP	<0.001	<LOQ	<LOQ
2	Gaibandha	Sundarganj	Boljan GPS	91108070207	0.053	12	30	not acceptable	AIRP	<0.001	<LOQ	<LOQ
3	Gaibandha	Sundarganj	Chondipur GPS	91108070101	0.062	13	24	not acceptable	AIRP	<0.001	<LOQ	<LOQ
4	Gaibandha	Sundarganj	Lal Camar GPS	10807140201	0.05	36	8.5	not acceptable	AIRP	<0.001	<LOQ	<LOQ
5	Gaibandha	Saghata	Gotia GPS	91108060204	0.057	8.1	32	not acceptable	AIRP	<0.001	<LOQ	<LOQ
6	Gaibandha	Polashbari	Melendoho GPS	108030701	0.055	6.5	28	not acceptable	AIRP	<0.001	<LOQ	<LOQ
7	Gaibandha	Polashbari	Horinabari 1no GPS	108030906	0.069	0	30	not acceptable	AIRP	<0.001	<LOQ	<LOQ
8	Gaibandha	Polashbari	Satarpara GPS	91108030609	0.060	0.04	24	not acceptable	AIRP	<0.001	<LOQ	<LOQ
9	Gaibandha	Gobindaganj	Maladhor GPS	91108021103	0.052	4.5	28	not acceptable	AIRP	<0.001	<LOQ	<LOQ
10	Gaibandha	Gobindaganj	Shakpala GPS	91108021102	0.224	8.4	26	not acceptable	AIRP	<0.001	<LOQ	<LOQ
11	Gaibandha	Gobindaganj	Polashbari GPS	108021006	0.057	2.9	30	not acceptable	AIRP	<0.001	<LOQ	<LOQ
12	Gaibandha	Gobindaganj	Khiribari GPS	108021502	0.061	0.9	32	not acceptable	AIRP	<0.001	<LOQ	<LOQ
13	Gaibandha	Gobindaganj	Uttar Popgoil GPS	108020806	0.295	4.2	34	not acceptable	AIRP	<0.001	<LOQ	<LOQ
14	Gaibandha	Gobindaganj	Bordhonkuthi GPS	108021104	0.066	1.3	30	not acceptable	AIRP	<0.001	<LOQ	<LOQ
15	Gaibandha	Gobindaganj	Shalmara GPS	91108021702	0.074	0.8	28	not acceptable	AIRP	<0.001	<LOQ	<LOQ
16	Gaibandha	Gobindaganj	Taluk Kanupur	91108020701	0.234	2.1	32	not acceptable	AIRP	<0.001	<LOQ	<LOQ
17	Cumilla	Devidwar	Sultanpur GPS	406031405	0.003	34.6	665	not acceptable	RO Filter	<0.001	4.20	<LOQ
18	Cumilla	Debidwar	Goneshpur	406039202	0.003	19.1	665	not acceptable	RO Filter	<0.001	3.20	<LOQ
19	Rangpur	Mithapukur	Imadpur Taltola GPS	99105071707	0	6.5	0	not acceptable	AIRP	<0.001	<LOQ	<LOQ
20	Rangpur	Mithapukur	Jogoda Nandapur GPS	99705079013	0	6.0	0	not acceptable	AIRP	<0.001	<LOQ	<LOQ

SL No	District Name	Upazila Name	Name Of School	School ID	Test Result			Remark	Suggested Option	After intervention		
					As	Fe	Cl			As	Fe	Cl
21	Rajshahi	Bagmar	Jiapara GPS	113070106	0.066	5.3	30	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
22	Rajshahi	Bagmar	Chai Para GPS	91113070608	0.074	2.6	18	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
23	Rajshahi	Bagmar	Chanpara Non-Govt Primary	99113079202	0.101	1.8	16	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
24	Rajshahi	Bagmar	Hatrum GPS	99113070103	0.087	5.4	15	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
25	Rajshahi	Bagmar	Nordash GPS	91113070201	0.099	2.2	16	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
26	Rajshahi	Bagha	Tapurkuria GPS	99103089003	0.045	5	15	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
27	Rajshahi	Bagha	Berarbari GPS	99113080602	0.065	0.1	17	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
28	Rajshahi	Bagha	Boalia GPS	91113070104	0.99	7.77	12	not acceptable	RO Filter	<0.001	<LOQ	<LOQ
29	Rajshahi	Bagha	Saljur GPS	91113070803	0.061	0.1	15	not acceptable	RO Filter	<0.001	<LOQ	<LOQ

Appendix-7: Water Quality Monitoring and Surveillance Protocol by DPHE

বাংলাদেশের পল্লী পানি সরবরাহ ব্যবস্থার

পানির গুণাগুণ মনিটরিং ও সার্ভিল্যান্স

প্রটোকল

(Water Quality Monitoring and Surveillance Protocol for Rural Water Supply System in Bangladesh)

জনস্বাস্থ্য প্রকৌশল অধিদপ্তর

আগস্ট ২০০৫

পরিশিষ্ট ১-৭ মূলে নির্দেশ করা হয়েছে। নির্বাচিত ক্রিটিক্যাল রাসায়নিক (critical chemical) পারামিটারসমূহ নিম্নে বর্ণনা করা হলো।

আর্সেনিক

১৯৯৩ সালে ভূ-গর্ভস্থ পানিতে আর্সেনিক দূষণের বিষয়টি উদ্ঘাটিত হওয়ার পর থেকে বাংলাদেশের ২৭৫ টি উপজেলার অগভীর নলকূপসমূহে বিভিন্ন মাত্রায় আর্সেনিক দূষণসংঘটিত হয়েছে। আর্সেনিক দূষিত পানি ব্যবহারে ফলে জনস্বাস্থ্য ঝুঁকির সম্মুখীন হয়, যা জনগণের মধ্যে কয়েক বছরের মধ্যে আর্সেনিকোসিস (arsenicosis) এর লক্ষণ হিসেবে প্রকাশ পাবে, এবং অভ্যন্তরীণ ও চর্ম ক্যানসারও হতে পারে। বাংলাদেশে আর্সেনিকই একমাত্র রাসায়নিক যৌগ যার ফলে স্বাস্থ্যের প্রতি মারাত্মক প্রতিক্রিয়া দেখা দিয়েছে।

নিয়মিত ল্যাবরেটরী প্রযুক্তি ব্যবহারের মাধ্যমে পানিতে আর্সেনিকের মাত্রার ভিত্তিতে বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (৩য় সংস্করণ) পানীয় জলের সাময়িক গাইড লাইন মান হিসেবে প্রতি লিটার পানীয় জলে ০.০১ মিলিগ্রাম (১০ মাইক্রোগ্রাম/লিটার) আর্সেনিকের উপস্থিতি নির্ধারণ করেছে। বাংলাদেশে বর্তমানে আর্সেনিকের ষ্ট্যান্ডার্ড মান প্রতি লিটারে ০.০৫ মিলি গ্রাম বা ৫০ মাইক্রোগ্রাম

ক্লোরাইড বা লবণাক্ততা (chloride)

বাংলাদেশের উপকূলীয় অঞ্চলের অগভীর নলকূপসমূহে উচ্চ মাত্রায় ক্লোরাইড বা লবণাক্ততা রয়েছে। লবণাক্ততা অনুপ্রবেশের কারণে বাংলাদেশে অগভীর পানিস্তরে লবনাক্ততা ক্রমশঃ বাড়ছে। তবে গভীর নলকূপসমূহে সাধারনতঃ কম মাত্রার লবণাক্ততা রয়েছে। পানির গুণাগুণ বিষয়ক বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (৩য় সংস্করণ) স্বাস্থ্যগত কোন গাইড লাইন মান প্রতিষ্ঠা করা হয়নি তবে লক্ষনীয় যে, প্রতি লিটারে ২৫০ মিলিগ্রাম মাত্রার বেশী লবণাক্ততা পানীয় জলের স্বাদ এবং গ্রহণযোগ্যতায় প্রভাব ফেলে। ক্লোরাইড থেকে উদ্ভূত স্বাদ সংযুক্ত কেশনের (cation) উপর নির্ভরশীল এবং সোডিয়াম, পটাশিয়াম এবং ক্যালশিয়াম ক্লোরাইডের মাত্রা প্রতি লিটার পানিতে ২০০ থেকে ৩০০ মিলি গ্রাম। বাংলাদেশে প্রতি লিটার পানিতে ১৫০ থেকে ৬০০ মিলিগ্রাম ক্লোরাইড গ্রহণযোগ্য এবং উপকূলীয় অঞ্চলে ভাল কোন উৎস না থাকলে প্রতি লিটারে ১০০০ মিলিগ্রাম পর্যন্ত গ্রহণ করা যায়।

আয়রন বা লৌহ (iron)

পানীয় জলে সাধারণভাবে লক্ষণীয় আয়রন বা লৌহের উপস্থিতি স্বাস্থ্যের জন্য উদ্বেগের বিষয় নহে। যদিও এর নিম্নতর মাত্রার দূষণে পানির চেহারা ও স্বাদে প্রভাব ফেলে। পানীয় জলের গুণাগুণ বিষয়ক বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (২য় সংস্করণ)-এ প্রতি লিটার পানিতে আয়রনের সাময়িক গাইড লাইন মান ০.০৩ মিলিগ্রাম নির্ধারণ করা হয়েছে। তবে এর ৩য় সংস্করণে আয়রনের জন্য কোন গাইড লাইন মান নির্ণয় করা হয়নি।

বাংলাদেশের অনেক অঞ্চলে আয়রনের উপস্থিতি গ্রহনযোগ্য সীমার চেয়ে বেশী। তাই কাঙ্খিত উদ্দেশ্যে ক্ষুদ্র আয়রন দূরীকরণ ইউনিট (mini iron removal units, IRU)-এর মাধ্যমে আয়রন দূরীকরণের চেষ্টা করা হয়। বাংলাদেশ ষ্ট্যান্ডার্ড অনুযায়ী পানীয় জলে আয়রনের উপস্থিতি হলো ০.৩-১.০মিলিগ্রাম / লিটার । পল্লী অঞ্চলে যেখানে পানির বিকল্প কোন উৎস নেই, সেখানে প্রতি লিটারে ৫.০ মিলিগ্রাম পর্যন্ত আয়রনের উপস্থিতিও গ্রহণযোগ্য বলে বিবেচিত হয় । এ সীমা বেড়ে গেলে আয়রন দূরীকরণ ইউনিট (iron removal unit) স্থাপন করা প্রয়োজন।

ম্যাঙ্গানিজ (manganese)

পানীয় জল সম্বন্ধীয় বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (২০০৪) প্রতি লিটারে ০.৪ মিলিগ্রাম ম্যাঙ্গানিজের উপস্থিতি সাময়িকভাবে স্বাস্থ্যগত গাইড লাইন মান হিসেবে গ্রহণ করা হয়েছে। পানি সরবরাহে প্রতি লিটারে ০.১ মিলিগ্রামের অধিক মাত্রায় ম্যাঙ্গানিজের উপস্থিতি থাকলে কোমল পানীয়তে অনাকাঙ্খিত স্বাদ এবং কাপড় চোপড়ে ও থালা বাসনে দাগ সৃষ্টি করে। বাংলাদেশ ষ্ট্যান্ডার্ড অনুযায়ী পানীয় জলে ম্যাঙ্গানিজের উপস্থিতি হলো ০.১ মিলিগ্রাম / লিটার।