

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

## **ENVIRONMENTAL IMPACT ASSESSMENT (EIA)**

*Of*

**KISHAN ACCUMULATORS LTD**

*Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh.*



**Report Prepared By**

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***“Smartly Treat Your Water”***



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**May - 2026**

## DECLARATION

বাংলাদেশ গেজেট, অতিরিক্ত, মার্চ ৫, ২০২৩

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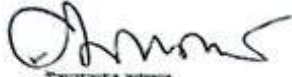
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ঘোষণাপত্র

[বিধি ১৫ এর উপ-বিধি (৪) দ্বারা]

আমি এই মর্মে ঘোষণা করিতেছি যে, আমার জ্ঞানসাপেক্ষে পরিবেশগত ব্যবস্থাপনা পরিকল্পনা এবং পরিবীক্ষণ কর্মসূচি প্রণয়ন করা হইয়াছে। পরিবেশগত ব্যবস্থাপনা পরিকল্পনায় উল্লিখিত সকল কার্যক্রম/পদক্ষেপ/পরিকল্পনা এবং পরিবীক্ষণ কর্মসূচি যথাযথভাবে বাস্তবায়নের জন্য আমি দায়ী থাকিব।

শিল্প প্রতিষ্ঠান/প্রকল্পের নাম: শ্রীমতী গ্যাকুয়ুমেন্টেশন লিমিটেড  
শিল্প প্রতিষ্ঠান/প্রকল্পের ঠিকানা: ভিক্টোরিয়াপুর, বাকুল উল্লা, নাজির মদর, নাজির



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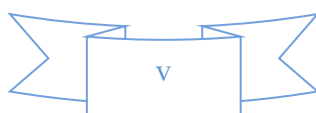
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## **TABLE OF CONTENTS**

|                                                                                  |           |
|----------------------------------------------------------------------------------|-----------|
| DECLARATION .....                                                                | ii        |
| TABLE OF CONTENTS.....                                                           | iii       |
| LIST OF FIGURES .....                                                            | vii       |
| LIST OF TABLES.....                                                              | viii      |
| ABBREVIATION.....                                                                | xi        |
| GLOSSARY .....                                                                   | xiv       |
| EXECUTIVE SUMMARY .....                                                          | xviii     |
| <b>1. INTRODUCTION .....</b>                                                     | <b>2</b>  |
| 1.1 Project Proponent and Contact Information.....                               | 2         |
| 1.2 Purpose and Background of the Project.....                                   | 3         |
| 1.3 Statement of Need and Project Benefits.....                                  | 3         |
| 1.4 Legal Framework and Regulatory Compliance .....                              | 4         |
| 1.5 Objectives of the EIA Study.....                                             | 5         |
| 1.6 Scope of Work.....                                                           | 6         |
| 1.7 EIA Methodology.....                                                         | 7         |
| 1.8 The EIA Team.....                                                            | 7         |
| 1.9 Structure of the EIA Report .....                                            | 9         |
| 1.10 ToR Compliance Matrix.....                                                  | 9         |
| 1.11 Limitations .....                                                           | 10        |
| 1.12 Acknowledgement.....                                                        | 11        |
| <b>2. POLICY AND LEGAL CONSIDERATIONS.....</b>                                   | <b>13</b> |
| 2.1 Environmental Compliance, Bangladesh.....                                    | 13        |
| 2.2 Relevant Major National Environmental Acts, Policies and Rules .....         | 14        |
| 2.2.1 The National Conservation Strategy.....                                    | 14        |
| 2.2.2 National Environmental Policy (NEP), 2018 .....                            | 14        |
| 2.2.3 The National Environmental Management Plan (NEMAP), 1995 .....             | 15        |
| 2.2.4 The Environmental Conservation Act, 1995 (Including Amendments 2010) ..... | 15        |
| 2.2.5 The Environmental Conservation Rules (ECR), 2023 .....                     | 18        |
| 2.2.6 The Environment Court Act, 2010 .....                                      | 20        |
| 2.2.7 Noise Pollution (Control) Rules, 2006.....                                 | 20        |
| 2.2.8 Bangladesh Biodiversity Act, 2017.....                                     | 21        |
| 2.2.9 Solid Waste Management Rules, 2021 .....                                   | 21        |
| 2.2.10 Air Pollution (Control) Rules, 2022.....                                  | 22        |
| 2.3 Other Relevant National Acts, Policies and Rules.....                        | 23        |
| 2.3.1 The Boilers Act, 1923.....                                                 | 24        |
| 2.3.2 The Factory Act, 1965.....                                                 | 25        |
| 2.3.3 The Forest Policy, 1994.....                                               | 27        |
| 2.3.4 Industrial Policy, 1999.....                                               | 27        |
| 2.3.5 The Building Construction Act, 1952.....                                   | 28        |
| 2.3.6 Bangladesh Building Construction Rules, 2008 .....                         | 28        |

|                                                                                   |           |
|-----------------------------------------------------------------------------------|-----------|
| 2.3.7 Bangladesh Wildlife Preservation Act (1973; Amended in 1974) .....          | 29        |
| 2.3.8 The Acquisition and Requisition of Immovable Property Ordinance, 1982 ..... | 30        |
| 2.3.9 The Protection and Conservation of Fish Rules, 1985 .....                   | 30        |
| 2.3.10 National Water Policy, 1999.....                                           | 31        |
| 2.3.11 Standards for Air, Water and Sound.....                                    | 31        |
| 2.4 Environmental Clearance Procedure.....                                        | 35        |
| <b>3. DESCRIPTION OF THE PROJECT .....</b>                                        | <b>38</b> |
| 3.1 Project Definition.....                                                       | 38        |
| 3.2 Study Area .....                                                              | 38        |
| 3.3 Basic Information of the Project.....                                         | 40        |
| 3.4 Production Process Flow.....                                                  | 44        |
| 3.5 Manufacturing Process Description.....                                        | 45        |
| 3.6 List of Machineries .....                                                     | 46        |
| 3.7 List of Raw Materials.....                                                    | 46        |
| 3.8 Land Use and Site Development.....                                            | 47        |
| 3.8 Resource Consumption .....                                                    | 48        |
| 3.8.1 Power and Fuel Consumption of the Project.....                              | 48        |
| 3.8.2 Water Consumption of the Project.....                                       | 49        |
| 3.8.3 Wastewater Generation and Management of the Project.....                    | 50        |
| <b>4. STUDY OF ALTERNATIVE OPTIONS.....</b>                                       | <b>56</b> |
| 4.1 Introduction .....                                                            | 56        |
| 4.2 Evaluation of the "No Project" Alternative .....                              | 56        |
| 4.3 Assessment of Alternative Locations.....                                      | 57        |
| 4.4 Detailed Justification for the Proposed Project Option.....                   | 58        |
| 4.5 Conclusion .....                                                              | 59        |
| <b>5. BASELINE ENVIRONMENT STUDY.....</b>                                         | <b>62</b> |
| 5.1 General Consideration .....                                                   | 62        |
| 5.2 Study Area .....                                                              | 62        |
| 5.3 Physical Environment .....                                                    | 63        |
| 5.3.1 Project Site.....                                                           | 63        |
| 5.3.2 Landform and Soil Classification .....                                      | 64        |
| 5.4 Climatic Condition.....                                                       | 68        |
| 5.4.1 Rainfall.....                                                               | 70        |
| 5.4.2 Average Temperature.....                                                    | 73        |
| 5.4.3 Humidity.....                                                               | 73        |
| 5.4.4 Wind Speed and Direction .....                                              | 74        |
| 5.5 Hydrology .....                                                               | 76        |
| 5.5.1 Surface Water Quality.....                                                  | 76        |
| 5.5.2 Ground Water Quality .....                                                  | 77        |
| 5.6 Noise Level .....                                                             | 79        |
| 5.7 Air Quality Parameters .....                                                  | 80        |
| 5.8 Regional Disasters .....                                                      | 81        |
| 5.9 Biological Environment.....                                                   | 83        |
| 5.9.1 General Consideration.....                                                  | 83        |

|                                                                                           |            |
|-------------------------------------------------------------------------------------------|------------|
| 5.9.2 Flora .....                                                                         | 84         |
| 5.9.3 Fauna .....                                                                         | 84         |
| 5.10 Socioeconomic Baseline Description .....                                             | 86         |
| 5.10.1 General .....                                                                      | 86         |
| 5.10.2 Administrative Areas.....                                                          | 86         |
| 5.10.3 Demographic Characteristics of the Project Area .....                              | 86         |
| 5.10.4 Utility Services of the Project Area .....                                         | 87         |
| <b>6. PROJECT LOCATION &amp; LAND USE.....</b>                                            | <b>90</b>  |
| 6.1 Project Location .....                                                                | 90         |
| 6.2 Present Use of the Land .....                                                         | 92         |
| 6.3 Distance from Environmentally Critical Area .....                                     | 92         |
| 6.4 Satellite View of the Project Location .....                                          | 94         |
| 6.5 Hydrological Map .....                                                                | 96         |
| 6.6 Geological Map.....                                                                   | 97         |
| 6.7 Topographical Map .....                                                               | 98         |
| <b>7. IDENTIFICATION, EVALUATION OF POTENTIAL IMPACTS &amp; MITIGATION MEASURES .....</b> | <b>100</b> |
| 7.1 Scoping of Impacts .....                                                              | 100        |
| 7.2 Evaluation of Predicated Adverse Impacts and Mitigation .....                         | 105        |
| 7.2.1 Impact due to Project Location.....                                                 | 105        |
| 7.2.2 Negative Impacts in the Context of Construction and their Mitigation.....           | 107        |
| 7.2.3 Impact at Due to Operation of the Project and their Mitigation.....                 | 110        |
| 7.3 Anticipated Positive Impacts of the Project.....                                      | 120        |
| 7.3.1 Job Opportunities.....                                                              | 121        |
| 7.3.2 Support of Local Businesses .....                                                   | 121        |
| 7.3.3 Infrastructure Development .....                                                    | 121        |
| 7.3.4 Revenue to Local Municipal Council.....                                             | 121        |
| 7.3.5 Gains to the Economy.....                                                           | 121        |
| <b>8. ENVIRONMENTAL MANAGEMENT PLAN .....</b>                                             | <b>123</b> |
| 8.1 General Consideration .....                                                           | 123        |
| 8.2 Environmental Management System .....                                                 | 123        |
| 8.3 Phase Specific Management Plan for the Project .....                                  | 123        |
| 8.4 Other Safety Plan .....                                                               | 130        |
| 8.4.1 Occupational Safety.....                                                            | 130        |
| 8.4.2 Emergency Responses.....                                                            | 130        |
| 8.4.3 Health and Environmental Hygiene.....                                               | 131        |
| <b>9. ENVIRONMENTAL MONITORING PLAN.....</b>                                              | <b>136</b> |
| 9.1 Monitoring Requirement.....                                                           | 136        |
| 9.2 Monitoring Indicators .....                                                           | 136        |
| 9.3 Other Monitoring Programs .....                                                       | 137        |
| 9.4 Monitoring Budget.....                                                                | 137        |
| 9.5 Environmental Monitoring Team .....                                                   | 138        |
| <b>10. PUBLIC CONSULTATION .....</b>                                                      | <b>140</b> |
| 10.1 General Consideration .....                                                          | 140        |



|                                                                    |            |
|--------------------------------------------------------------------|------------|
| 10.2 Objectives of the Consultation.....                           | 140        |
| 10.3 Methodology .....                                             | 141        |
| 10.4 Important Dates, Venues and Points.....                       | 142        |
| 10.5 Findings of the Meetings .....                                | 143        |
| 10.6 Information Disclosure Policy .....                           | 144        |
| <b>11. EMERGENCY RESPONSE &amp; DISASTER MANAGEMENT PLAN .....</b> | <b>149</b> |
| 11.1 Emergency Response and Disaster Management Plan .....         | 149        |
| 11.2 Six Steps in Emergency Response .....                         | 150        |
| 11.3 Reporting Incidents and Accidents .....                       | 151        |
| 11.4 Approaches to Emergency Response.....                         | 151        |
| 11.5 Disaster Management Plan .....                                | 152        |
| <b>12. FINDINGS &amp; RECOMMENDATIONS.....</b>                     | <b>155</b> |
| 12.1 Findings of the Study .....                                   | 155        |
| 12.2 Recommendations.....                                          | 156        |
| <b>13. CONCLUSION .....</b>                                        | <b>158</b> |
| 13.1 Overall Assessment of Environmental Impacts .....             | 158        |
| 13.2 Effectiveness of Proposed Mitigation Measures.....            | 158        |
| 13.3 Alignment with Regulatory and Sustainability Objectives.....  | 159        |
| 13.4 Final Recommendation .....                                    | 160        |
| <b>14. REFERENCES.....</b>                                         | <b>162</b> |
| References.....                                                    | 162        |
| Annexures .....                                                    | 164        |

## **LIST OF FIGURES**

|                                                                                                                                |     |
|--------------------------------------------------------------------------------------------------------------------------------|-----|
| Figure 2.1: Process of Getting Environmental Clearance Certificates .....                                                      | 36  |
| Figure 3.1: Location Map of the Project.....                                                                                   | 39  |
| Figure 3.2:Major Industries in Bangladesh.....                                                                                 | 40  |
| Figure 3.3: Integrated production process flow .....                                                                           | 44  |
| Figure 3.4: Water Balance Diagram of the Project.....                                                                          | 51  |
| Figure 5.1: Location Map of the Project.....                                                                                   | 63  |
| Figure 5.2: Physiography of Bangladesh.....                                                                                    | 66  |
| Figure 5.3: General Soil Map of Bangladesh.....                                                                                | 67  |
| Figure 5.4: Climate Map of Bangladesh.....                                                                                     | 69  |
| Figure 5.5: Average rainfall map of Bangladesh.....                                                                            | 72  |
| Figure 6.1: Location Map of the Kishan Accumulators Ltd.....                                                                   | 90  |
| Figure 6.2: Location of the Study Area Showing District and Upazila Distribution.....                                          | 91  |
| Figure 6.3: Picture depicts the present site condition of the Project.....                                                     | 92  |
| Figure 6.4: Distance from Ecologically Critical Area .....                                                                     | 93  |
| Figure 7.1: Wastewater Generation and Management at a Glance.....                                                              | 114 |
| Figure 7.2: Solid Waste Management Overview of the Project .....                                                               | 116 |
| Figure 9.1: Environmental Monitoring Team.....                                                                                 | 138 |
| Figure 10.1: Process Flow of Public Consultation Meeting arranged with the presence of factory authority and local people..... | 141 |
| Figure 11.1: Illustrates an Example of Emergency Management Approach to Plant Construction.....                                | 153 |

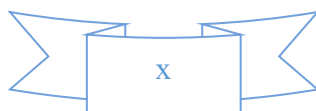
## **LIST OF TABLES**

|                                                                                                                   |     |
|-------------------------------------------------------------------------------------------------------------------|-----|
| Table 1.1: Project Proponent Details .....                                                                        | 2   |
| Table 1.2: The Environmental Impact Assessment Team .....                                                         | 7   |
| Table 1.3: ToR compliance matrix .....                                                                            | 9   |
| Table 2.1: Important Provisions of ECA - 1995 .....                                                               | 15  |
| Table 2.2: Standards for Drinking Water.....                                                                      | 31  |
| Table 2.3: Standards for Sewage Discharge .....                                                                   | 33  |
| Table 2.4: Standards for Sound.....                                                                               | 34  |
| Table 2.5: Ambient Air Quality Standards .....                                                                    | 35  |
| Table 3.1: Basic Information of the Project.....                                                                  | 41  |
| Table 3.2: Power and Fuel Requirement of the Project.....                                                         | 48  |
| Table 3.3: Calculation of Water Use of the Project.....                                                           | 49  |
| Table 5.1: Monthly Average Rainfall in the project area .....                                                     | 70  |
| Table 5.2: Surface Water Test Summary.....                                                                        | 76  |
| Table 5.3: Ground Water quality (limited parameters) of the Project .....                                         | 77  |
| Table 5.4: Noise level around the project site.....                                                               | 79  |
| Table 5.5: Air quality parameter around the project site. ....                                                    | 80  |
| Table 5.6: Zone Wise Earthquake Information in Bangladesh.....                                                    | 81  |
| Table 7.1: Checklist for identification of probable Environmental Impact of the project (Plant Location).....     | 102 |
| Table 7.2: Checklist for identification of probable Environmental Impact of the project (Plant Construction)..... | 103 |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|                                                                                                                         |     |
|-------------------------------------------------------------------------------------------------------------------------|-----|
| Table 7.3: Checklist for identification of probable Environmental Impact of the project (Operation of the Plant). ..... | 104 |
| Table 7.4: Wastewater Management at a Glance.....                                                                       | 113 |
| Table 9.1: Monitoring Parameters for Different Components.....                                                          | 136 |
| Table 9.2: Monitoring Budget for Different Parameters .....                                                             | 137 |

## **ABBREVIATION**



## **ABBREVIATION**

|      |                                           |
|------|-------------------------------------------|
| BBS  | Bangladesh Bureau of Statistics           |
| BCAS | Bangladesh Centre for Advanced Studies    |
| BMD  | Bangladesh Meteorological Department      |
| BWDB | Bangladesh Water Development Board        |
| CDMP | Comprehensive Disaster Management Program |
| DAE  | Department of Agricultural Extension      |
| DC   | Deputy Commissioner                       |
| DG   | Director General                          |
| DGHS | Directorate General of Health Services    |
| DOE  | Department of Environment                 |
| ECR  | Environment Conservation Rules 2023       |
| EIA  | Environmental Impact Assessment           |
| EMP  | Environmental Management Plan             |
| EQS  | Environmental Quality Standard            |
| GIS  | Geographic Information System             |
| GoB  | Government of Bangladesh                  |
| GPS  | Global Positioning System                 |
| IEC  | Important Environmental Component         |
| IEE  | Initial Environmental Examination         |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|        |                                                     |
|--------|-----------------------------------------------------|
| LGED   | Local Government Engineering Department             |
| MoEFCC | Ministry of Environment, Forest, and Climate Change |
| MNC    | Multinational Corporation                           |
| NEMAP  | National Environment Management Action Plan         |
| NGO    | Non-Government Organization                         |
| NWMP   | National Water Management Plan                      |
| PAP    | Project Affected Person                             |
| PCP    | Project Concept Paper                               |
| PDB    | Power Development Board                             |
| SRDI   | Soil Resource Development Institute                 |
| TOR    | Terms of Reference                                  |

## **GLOSSARY**

## **GLOSSARY**

**Adverse impact:** An impact that is considered undesirable.

**Ambient air:** Surrounding air.

**Aquatic:** Growing or living in or near water.

**Bangla:** Bengali language.

**Baseline (or existing) conditions:** The ‘baseline’ essentially comprises the factual understanding and interpretation of existing environmental, social and health conditions of where the business activity is proposed. Understanding the baseline shall also include those trends present within it, and especially how changes could occur regardless of the presence of the project, i.e., the ‘No development Option’.

**Bazar:** Market.

**Beel:** A ‘back swamp’ or depression can be either perennial or seasonal. Beneficial impacts: Impacts, which are considered to be desirable and useful.

**Biological diversity:** The variety of life forms, the different plants, animals and microorganisms, genes they contain and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecological diversity.

**Ecosystem:** A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environment interacting as an ecological unit.

**Emission:** The total amount of solid, liquid or gaseous pollutant emitted into the atmosphere from a given source within a given time, as indicated, for e.g., in grams per cubic meter of gas or by a relative measure, upon discharge from the source.

**Environmental effects:** The measurable changes, in the natural system of productivity and environmental quality, resulting from a development activity.

**Environmental impact assessment (EIA) / Environmental assessment:** The systematic, reproducible and interdisciplinary identification, prediction and evaluation, mitigation and

management of impacts from a proposed development and its reasonable alternatives, sometimes known as environmental assessment.

**Environmental Impact:** An estimate or judgment of the significance and value of environmental effects for natural, socio-economic and human receptors.

**Management Plan (EMP):** A Plan to undertake an array of follow-up activities which provide for the sound environmental management of a project/ intervention so that adverse environmental impacts are minimized and mitigated; beneficial environmental effects are maximized; and sustainable development is ensured.

**Environmental Management:** Managing the productive use of natural resources without reducing their productivity and quality.

**Erosion:** Process in which wind and water removes materials from their original place; for instance, soil washed away from an agricultural field.

**Evaluation:** The process of looking back at what has been really done or accomplished.

**Fauna:** A collective term denoting the animals occurring in a particular region or period.

**Field Reconnaissance:** A field activity that confirms the information gathered through secondary sources. This field study is essentially a rapid appraisal.

**Flora:** All of the plants found in a given area.

**Habitat:** The natural home or environment for a plant or animal.

**Household:** A household is identified as a dwelling unit where one or more persons live and eat together with common cooking arrangement. Persons living in the same dwelling unit having separate cooking arrangements constitute separate household. Important

**Environmental Component (IEC):** These are environmental components of biophysical or socio-economic importance to one or more interested parties. The use of important environmental components helps to focus the environmental assessment.

**Initial Environmental Assessment / Evaluation:** Preliminary analysis undertaken to ascertain whether there are sufficient likely significant adverse impacts to warrant a ‘full’ EIA. In some countries, use of initial assessment forms a meaning of “screening” proposed projects.

**Khal:** Small Channel, canal. Land use: Types include agriculture, horticulture, settlement, pisciculture and industries.

**Mauza:** A Bangla word for the smallest government administrative area corresponding to village revenue unit.

**Mitigation:** An action, which may prevent or minimize adverse impacts and enhance beneficial impacts.

**Negative Impact:** Negative change from the existing situation due to the project.

**Public involvement / Public consultation:** A range of techniques that can be used to inform, consult or interact with stakeholders affected / to be affected by a proposal.

**Reversible impact:** An environmental impact that recovers either through natural process or with human assistance (e.g., cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built).

**Taka:** Unit of Bangladeshi currency.

**Terrestrial:** Living on land.

**Thana:** Sub-district level of government administration, comprising several unions under district.

**Union:** Smallest unit of local self-government comprising several villages.

**Upazila:** Sub-district name. Upazila introduced in 1982.

**Zila:** Bengali word of district.

## **EXECUTIVE SUMMARY**

## **EXECUTIVE SUMMARY**

This document constitutes the **Environmental Impact Assessment (EIA)** of **Kishan Accumulators Ltd.** and has been developed by **EPL Group** in close collaboration with the factory management.

The report highlights the relevant national legislations, policies, and regulatory frameworks that the project must comply with in order to obtain Environmental Clearance from the Department of Environment (DoE), Bangladesh. The applicable rules and guidelines serve as a foundation to ensure that the project adheres to sustainable and environmentally responsible practices.

As part of the assessment, the consulting team has conducted an existing environmental examination of the project site and its surroundings. Baseline studies on key environmental components such as air, water, soil, noise, and ecology have been carried out to establish the present condition of the environment. Project activities have been carefully analyzed to identify their interactions with these environmental components, as well as the possible dependencies and sensitivities that may influence project performance and local environmental quality.

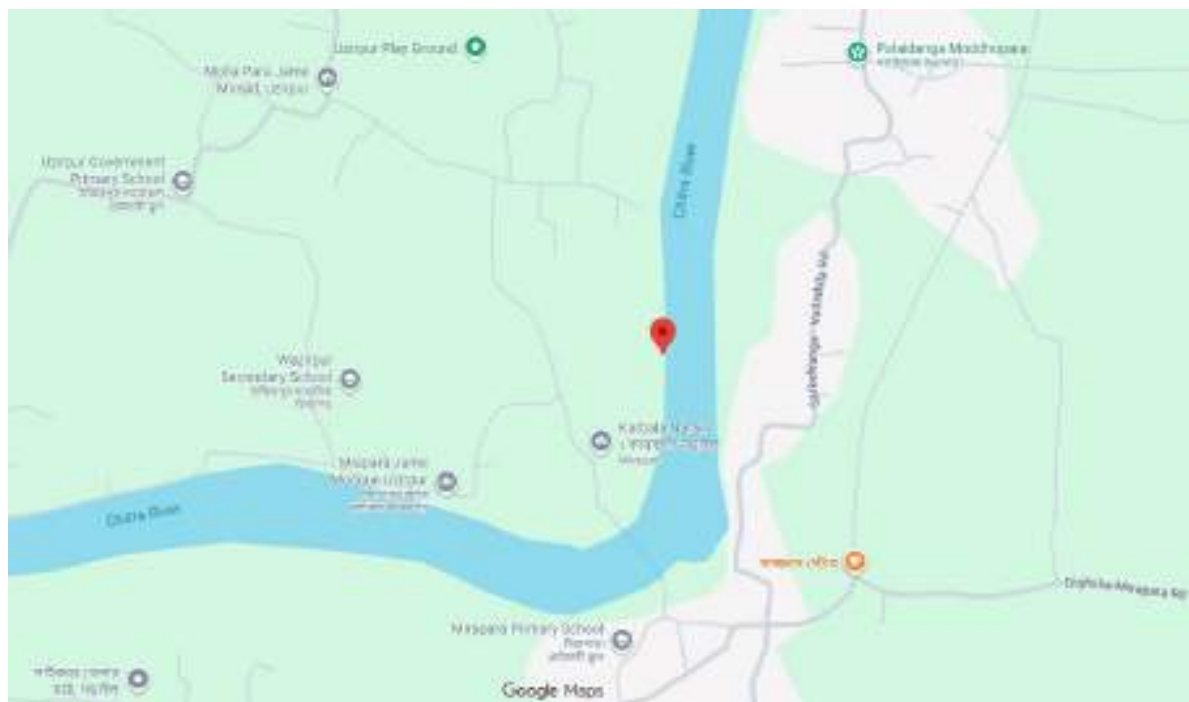
Based on this analysis, the EIA predicts the potential environmental impacts both beneficial and adverse arising from the construction and operation phases of the paper production unit. The magnitude and significance of these impacts have been evaluated by comparing them with the baseline conditions and considering the socio-economic context of the project area.

To address the potential negative impacts, the study proposes a set of mitigation measures designed to minimize, control, or eliminate adverse effects on the environment. In addition, opportunities for environmental enhancement have been identified to ensure that the project contributes positively to the local community and ecosystem.

Finally, a detailed **Environmental Management Plan (EMP)** has been formulated, incorporating monitoring requirements, institutional responsibilities, and compliance mechanisms. The EMP will act as a guiding framework for the proponent to implement effective environmental safeguards, ensure compliance with regulatory obligations, and promote sustainable development through the establishment of the new battery manufacturing project.

### ***Background of the Project***

The proposed project, Kishan Accumulators Ltd., is planned to be established at Uzirpur, Bokultola, Narail Sadar, Narail, at the geographic location of 23.127414° N latitude and 89.520820° E longitude. The project will manufacture Lead Acid Starter Batteries (LAS) with an estimated production capacity of 1,300 units per month to meet the growing demand for battery products in Bangladesh.



The total project area is approximately 111 decimal of land, which is currently vacant and suitable for industrial development. The estimated investment for the project is around BDT 45,529,000, reflecting the company's commitment to industrial expansion and economic contribution. Approximately 6,000 kg of raw materials will be required per month, including lead, lead oxide, sulfuric acid, plastic containers, separators, and battery covers for the manufacturing process. The project is expected to generate employment opportunities, support local economic activities, and contribute to the development of the battery manufacturing sector while maintaining environmental compliance and sustainable operational practices.

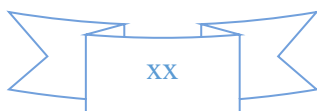
### ***EIA Study Methodology***

The Environmental Impact Assessment (EIA) study has been conducted following a systematic and scientific approach to evaluate the potential environmental impacts associated with the proposed project. The methodology adopted for the study includes the following steps:

- ✓ Assessment of the existing environmental conditions of the project site and its surrounding areas to establish baseline environmental data, which serves as a reference framework for evaluating potential impacts arising from the implementation of the project.
- ✓ Identification and evaluation of potential environmental impacts that may occur during the development and construction phase of the project activities.
- ✓ Identification, prediction, and assessment of environmental impacts that may arise during the operational phase of the project.
- ✓ Preparation of a comprehensive Environmental Management Plan (EMP), including appropriate mitigation measures to minimize adverse environmental impacts, enhance positive impacts, and establish environmental monitoring requirements for both construction and operational phases.
- ✓ Identification of environmental issues and concerns that may require further detailed investigation, analysis, or specialized studies for effective environmental management and decision-making.

### ***Existing Environmental Condition***

An existing environmental survey was conducted to assess the prevailing environmental conditions of the project area and its surrounding environment. As part of the baseline study, monitoring of water quality, air quality, soil quality, and noise levels was carried out at the project site, the detailed results of which are presented in Chapter 5 of this report. The monitored baseline environmental parameters, including air, noise, and water quality, were found to be within the permissible limits prescribed by the Department of Environment (DoE), Bangladesh. The findings indicate that the current environmental condition of the project area is environmentally acceptable for the proposed industrial activity. Based on the existing environmental condition and the proposed operational process, the project is not expected to impose any significant adverse impact on the surrounding environment, provided that



appropriate environmental management and mitigation measures are properly implemented during operation.

### ***Potential Positive impacts***

The project is expected to generate several positive impacts on the local and regional economy. These include the creation of both direct and indirect employment opportunities during construction and operation phases, thereby enhancing livelihoods in the surrounding community. The increased demand for goods and services will support local businesses such as suppliers, transport operators, and service providers, fostering secondary economic growth. In addition, the establishment of the new unit will contribute to local infrastructure development through improved roads, utilities, and associated facilities. Furthermore, the project will generate revenue for the Local Council in the form of taxes, fees, and other financial contributions, strengthening local governance and enabling reinvestment in community services.

### ***Potential negative environmental impacts and mitigation measures***

Major environmental component that may be affected by the project activity is water, acoustic environment, air, soil etc. Some of the major environmental impacts and proposed mitigation measure is shown below:

Table: Major environmental impacts and proposed mitigation measure

| Affected Environmental Component/ Concern | Anticipated Impact | Proposed/Implemented mitigation/Enhancement Measures                                                                                                                                                                                                                   |
|-------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water Environment                         | Water pollution    | <ul style="list-style-type: none"><li>➤ Take care of ETP, and Plumbing system of the project.</li><li>➤ Ensure proper sanitation facilities.</li><li>➤ Increase awareness and training.</li></ul>                                                                      |
| Acoustic Environment                      | Noise pollution    | <ul style="list-style-type: none"><li>➤ Noise shielding by barriers or buildings.</li><li>➤ Maintaining adequate buffer zones</li><li>➤ Green belt development.</li><li>➤ Strict use of PPEs inside noisy areas.</li><li>➤ Regular noise quality monitoring.</li></ul> |
| Air Quality                               | Air Pollution      | <ul style="list-style-type: none"><li>➤ Installation of ATP where required.</li><li>➤ Proper management of solid waste.</li><li>➤ Effective control of vehicular traffic.</li></ul>                                                                                    |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|                        |                               |                                                                                                                                                                                                                               |
|------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                               | ➤ Maintaining adequate stack height for boiler.                                                                                                                                                                               |
| Solid Waste Generation | Air, Water and Soil Pollution | ➤ Proper solid waste management system.<br>➤ Sufficient number of waste handling bins.<br>➤ Awareness and training.                                                                                                           |
| Traffic congestion     |                               | ➤ Sufficient parking facility should be provided.<br>➤ Everybody should abide by traffic rules.                                                                                                                               |
| Soil Contamination     |                               | ➤ Making ZLD system including ETP for avoiding water discharge.<br>➤ Proper solid waste management following the national Solid Waste Management Rules.<br>➤ Proper management of ETP sludge for avoiding Lead contamination. |

***Environmental Management and Monitoring Plan***

A comprehensive Environmental Management and Monitoring Plan has also been proposed in the report to ensure effective implementation of mitigation measures and long-term environmental safeguards. The present study concludes that the identified adverse environmental impacts are not significant and can be effectively managed through proper planning, modern pollution control technologies, and strict adherence to the recommended mitigation strategies.

Hence, considering the commitment of the project authority to undertake all necessary measures for conserving environmental quality at the proposed project site and its surrounding environment, it is recommended that the Department of Environment may issue the Site Clearance and Environmental Clearance Certificates for the proposed project.

# **CHAPTER 01**

## **INTRODUCTION**

## **1. INTRODUCTION**

This report presents the comprehensive Environmental Impact Assessment (EIA) for the proposed Lead Acid Starter Battery (LAS) Manufacturing Unit to be established by Kishan Accumulators Ltd. at Uzirpur, Bokultola, Narail Sadar, Narail. This initiative represents a significant step toward industrial development in the region through the establishment of a modern battery manufacturing facility. The project is designed to produce Lead Acid Starter Batteries with a production capacity of approximately 1,300 units per month, aiming to meet the growing national demand for reliable battery products and reduce dependency on imports. As required under the Environmental Conservation Rules (ECR), 2023, this EIA serves as an essential tool to ensure that the proposed project is developed in an environmentally sound, socially responsible, and sustainable manner, in alignment with national environmental protection goals and sustainable industrial development objectives.

### **1.1 Project Proponent and Contact Information**

For Kishan Accumulators Ltd.'s proposed Lead Acid Starter Battery (LAS) Manufacturing Unit, this comprehensive Environmental Impact Assessment (EIA) study has been carefully prepared to evaluate the environmental implications of the new industrial development. As an emerging industrial enterprise, Kishan Accumulators Ltd. aims to contribute to the growing demand for battery products in Bangladesh through the establishment of a modern and efficient manufacturing facility.

*Table 1.1: Project Proponent Details*

| <b>Detail</b>      | <b>Information</b>                       |
|--------------------|------------------------------------------|
| Company Name       | Kishan Accumulators Ltd.                 |
| Nature of Business | Manufacturing Factory                    |
| Project Type       | Lead Acid Starter Battery (LAS)          |
| Factory Location   | Uzirpur, Bokultola, Narail Sadar, Narail |
| Contact Person     | Amaresh Chandra Saha - CEO.              |
| Contact Phone      | +8801711539437                           |
| Contact Email      | kishanaccumulationsltd@gmail.com         |
| Legal Status       | Private Limited Company                  |

## **1.2 Purpose and Background of the Project**

**Kishan Accumulators Ltd.** is a proposed industrial undertaking planned to be established at Uzirpur, Bokultola, Narail Sadar, Narail, Bangladesh. The company aims to expand its industrial footprint by setting up a modern Lead Acid Starter Battery (LAS) manufacturing unit within the project area. For this purpose, the project authority has taken necessary regulatory and administrative preparations in accordance with local government requirements, including trade license-related procedures.

This initiative is designed to utilize the company's emerging industrial capacity to meet the increasing demand for automotive batteries in the domestic market, moving beyond basic production toward a more structured and technology-driven manufacturing process. The proposed facility will be equipped with advanced machinery and modern production technology to manufacture high-quality Lead Acid Starter Batteries for automotive and industrial applications.

The plant will produce approximately 1,300 units per month, supported by efficient utilization of raw materials such as lead, lead oxide, sulfuric acid, plastic containers, separators, and battery components. With a total land area of 111 decimals and an estimated investment of BDT 45,529,000, the project is expected to establish itself as a significant contributor in the local battery manufacturing sector.

This initiative is aligned with Bangladesh's broader vision of industrial growth, import substitution, and economic diversification. The project is expected to stimulate regional development, create employment opportunities, and strengthen backward and forward linkages within the local economy, thereby contributing to national industrial resilience and sustainable development objectives.

## **1.3 Statement of Need and Project Benefits**

The demand for Lead Acid Starter Batteries (LAS) in Bangladesh has been steadily increasing, driven by the expansion of the automotive sector, growth in transport services, rural electrification, and rising use of backup power systems. At present, a considerable share of this demand is met through imports, resulting in foreign currency outflow and increased dependency on external markets. This proposed project is therefore essential to strengthen domestic production capacity, ensure a stable and reliable supply of quality batteries, and reduce import dependency in the national battery sector.

The benefits of this project extend beyond simple economic contribution. It will generate direct and indirect employment opportunities for local people, thereby improving livelihoods and supporting skill development in modern manufacturing and industrial operations. In addition, the establishment of the plant will stimulate the local economy through the development of ancillary industries, transportation services, raw material supply chains, and maintenance support systems. Overall, the project is expected to create a positive socio-economic ripple effect in the Narail region while contributing to sustainable industrial growth at the national level.

#### **1.4 Legal Framework and Regulatory Compliance**

The Environmental Conservation Rules (ECR), 2023 of the People's Republic of Bangladesh mandate the preparation and approval of this Environmental Impact Assessment (EIA) study for the proposed Lead Acid Starter Battery (LAS) manufacturing project. As per Schedule-1 of the ECR 2023, battery manufacturing activities involving lead and related chemical processes are classified under the Red Category, indicating a high potential for environmental impacts and requiring strict regulatory control.

Accordingly, such projects must undergo a comprehensive and detailed EIA process prior to implementation, along with obtaining prior approval from the Department of Environment (DoE). This includes assessment of potential impacts, development of appropriate mitigation measures, and compliance with ambient environmental standards for air, water, soil, and noise, as well as adherence to permissible discharge and emission limits set by the regulatory authority.

Under this regulatory framework, any Red Category industrial operation is required to submit an EIA report along with an Environmental Management Plan (EMP) and other necessary supporting documents to obtain an Environmental Clearance Certificate (ECC). Based on the adequacy and acceptability of the submitted information, the Department of Environment issues an initial Site Clearance followed by the final Environmental Clearance Certificate for project implementation.

In compliance with these legal and regulatory requirements, the present EIA study has been conducted as part of the formal process for environmental approval of the proposed project, ensuring that all potential environmental implications are properly identified, evaluated, and addressed in accordance with national environmental legislation.

This report has been scrupulously developed following the specific **Terms of Reference (ToR)** officially issued by the DoE (**Record No: 22.02.4065.307.072.001.25.1, Date: 26/02/2026**). It adheres to the stringent guidelines outlined in **Schedule-11 and Rule-15 of the ECR 2023**. The project proponent, **Kishan Accumulators Ltd.**, hereby affirms its unwavering commitment to adhering to all national environmental regulations and standards throughout every phase of the project's lifecycle from construction and operation to eventual decommissioning.

## **1.5 Objectives of the EIA Study**

The Environmental Impact Assessment (EIA) for the proposed battery manufacturing project by **Kishan Accumulators Ltd.** is a systematic and objective process designed to fulfil regulatory requirements and ensure sustainable project development. To comprehensively identify, predict, evaluate, and mitigate the potential significant biophysical, social, and economic impacts both beneficial and adverse of the proposed project during its construction and operational phases. The ultimate aim is to ensure the project is environmentally sound, socially acceptable, and compliant with all national regulations, thereby facilitating sustainable development. The core objective of this Environmental Impact Assessment (EIA) is to ensure the proposed battery production unit is developed in an environmentally sustainable and socially responsible manner. The key goals are to:

- **Identify Impacts:** Systematically determine all potential positive and negative environmental and social impacts of the project's construction and operation.
- **Propose Mitigation:** Develop a practical Environmental Management Plan (EMP) with effective measures to avoid, minimize, and manage adverse impacts.
- **Ensure Compliance:** Guarantee the project fully adheres to national regulations, including the Environmental Conservation Rules (ECR) 2023 and the specific Terms of Reference (ToR) issued by the Department of Environment (DoE).
- **Engage Stakeholders:** Conduct meaningful public consultation to address community concerns and incorporate feedback into the project planning.
- **Inform Decision-Making:** Provide a clear, scientific basis for the DoE to make an informed decision on granting environmental clearance.

## **1.6 Scope of Work**

This Environmental Impact Assessment (EIA) will be conducted in full compliance with the Department of Environment's (DoE) approved Terms of Reference (ToR). The scope encompasses the following key activities:

**1. Baseline Data Collection:** Establish existing environmental conditions by collecting and analyzing:

- **Air Quality:** Monitoring of SPM, PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub> at **8 locations**.
- **Water Quality:** Sampling surface water bodies at **8 locations**, including points upstream and downstream of the proposed discharge.
- **Noise Levels:** Monitoring at **8 locations** within the study area.
- **Ecology:** Survey of flora and fauna, focusing on rare or endangered species.
- **Socioeconomics:** Profile of local communities, livelihoods, and vulnerable groups.

**2. Impact Assessment:** Identify and evaluate potential impacts from construction and operation on air quality, water resources, noise, waste generation, ecology, and socio-economic conditions.

**3. Mitigation & Management Planning:** Develop a detailed **Environmental Management Plan (EMP)** containing:

- Technical specifications for pollution control systems (ETP, ATP etc.)
- Waste management and recycling strategies.
- A Disaster Management Plan (DMP) and Occupational Health & Safety (OHS) plan.

**4. Stakeholder Engagement:** Conduct public consultations including Focus Group Discussions (FGDs) to gather and incorporate community feedback into the project design and EMP.

**5. Reporting:** Compile all data, analysis, and plans into a comprehensive EIA report for submission to the DoE, ensuring it provides a clear basis for informed decision-making.

## 1.7 EIA Methodology

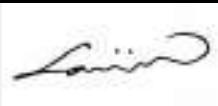
The EIA methodology employed for this study is a systematic, multi-stage, and scientifically grounded process designed to identify, predict, evaluate, and mitigate the potential biophysical, social, and economic impacts of the proposed project. The process encompasses:

- **Scoping:** Defining the key issues and boundaries of the study based on the DoE's ToR.
- **Baseline Data Collection:** Establishing the existing environmental and socio-economic conditions through extensive field surveys, sampling, and laboratory analysis.
- **Impact Prediction & Assessment:** Utilizing industry-standard models and expert judgment to forecast potential positive and negative impacts.
- **Mitigation & Management Planning:** Developing a detailed Environmental Management Plan (EMP) and Monitoring Plan to avoid, minimize, and mitigate adverse impacts.
- **Public Consultation:** Engaging with stakeholders to incorporate their concerns and values into the decision-making process.

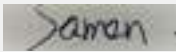
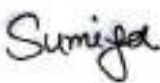
## 1.8 The EIA Team

To ensure the highest level of professionalism and technical rigor, the study has been conducted by a multidisciplinary team of accredited experts from Water and Environmental Engineering. The team's composition is detailed below, demonstrating a blend of academic excellence and extensive practical experience tailored to the project's specific needs.

*Table 1.2: The Environmental Impact Assessment Team*

| Name                                | Qualification                                                                                                             | Key Responsibility Area | Experience | Signature                                                                             |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------|------------|---------------------------------------------------------------------------------------|
| <b>Engr. Husain Md. Sajib, MIEB</b> | B.Sc. in Civil Engineering (SUB).<br>M. Engg. in Civil and Environmental Engineering (BUET).<br>M. Econ. in Environmental | <b>Team Leader</b>      | 8 years    |  |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

| Name                         | Qualification                                                                                                                        | Key Responsibility Area                                                                             | Experience | Signature                                                                             |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------|
|                              | Economics (DU)<br>Lead Auditor, EMS (ISO 14001:2015)                                                                                 |                                                                                                     |            |                                                                                       |
| <b>Md. Abdul Momen, MIEB</b> | MSc. in Environmental Engineering (BUET)<br>MSc. in Environmental Science and Management (JU).<br>Lead Auditor, EMS (ISO 14001:2015) | Environmental Laws, Regulations and Other Legal Bindings Review, Data collection and report writing | 7 Years    |    |
| <b>Abdul Goni Mia</b>        | Senior Chemist, EPL Group<br>B.Sc. (Hon's) and M.Sc. in Chemistry (NU)                                                               | Baseline Study, Disaster Management Plan                                                            | 13 Years   |   |
| <b>Md. Shahidul Hassan</b>   | M.Sc. in Environmental Science and Management (JU)                                                                                   | Impact Analysis and Relevant literature review                                                      | 6 Years    |  |
| <b>Yasir Arafat</b>          | B.Sc. in Civil Engineering.<br>M.Sc. in Water Resource Management (IWMF, BUET).                                                      | GIS Mapping and Survey                                                                              | 2 Years    |  |
| <b>Sumiya Tull Ferdous</b>   | BSS in Sociology (RU)                                                                                                                | Public Consultation, Social Impact Assessment                                                       | 2 Years    |  |

## **1.9 Structure of the EIA Report**

This report is structured to provide a logical flow of information, beginning with a description of the existing environment, followed by a detailed project description, impact assessment, mitigation plans, and concluding with recommendations. The report includes the following key chapters: Policy and Legal Considerations, Project Description, Analysis of Alternatives, Baseline Environmental Conditions, Impact Identification and Assessment, Environmental Management Plan, Environmental Monitoring Plan, Public Consultation, Risk and Disaster Management Plan, Occupational Health & Safety (OHS) plan, Conclusions, and annexures.

## **1.10 ToR Compliance Matrix**

The following table presents evidence of compliance with the ToR requirements. The study and report have been prepared in accordance with the chapter structure outlined in the Terms of Reference (ToR) submitted to the Department of Environment (DoE). The report also addresses all relevant issues and requirements specified in the approval letter.

*Table 1.3: ToR compliance matrix*

| <b>DoE REQUIREMENTS (From Approval Letter)</b>                                                                       |                                      |                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ToR Point</b>                                                                                                     | <b>Addressed in Report (Chapter)</b> | <b>Remarks</b>                                                                                                                                                                 |
| Production Process, Pollution Source and Management                                                                  | Detail discussed in the Chapter 3    | The Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) are presented as two separate chapters in this report: Chapter 7 and Chapter 8, respectively. |
| Detail Environmental and Social Baseline information                                                                 | Detail discussed in the Chapter 5    | -                                                                                                                                                                              |
| Anticipated Environmental and Social Impacts due to the Project shall be identified and assessed for their magnitude | Detail discussed in the Chapter 7    | -                                                                                                                                                                              |

|                                     |                                           |                                                                                                                                |
|-------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Occupational Health and Safety Plan | Detail discussed in the Chapter 8 (8.4.1) | The Occupational Health and Safety Plan is discussed in detail under Chapter 8 (Environmental Management Plan), Section 8.4.1. |
|-------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|

### **1.11 Limitations**

Despite its best efforts to be accurate and thorough, this EIA report has certain inherent limitations. Natural temporal variations may be found in the baseline data, which represents environmental conditions for a particular monitoring period. There is some degree of uncertainty surrounding future operational parameters and external factors like climate variables, even if predictive modelling of consequences is based on the best available data and recognized procedures. Based on the facts available at the time of writing and the project design, this report offers an evaluation.

Services performed by the consultant are conducted in a manner consistent with that level of care and skill generally exercised by members of the engineering and consulting profession. The report may not exhaustively cover an investigation of all possible circumstances that may exist. However, an effort is made to discover all meaningful areas under the stipulated time available.

In evaluating subject site, consultant relies in good faith on information provided by client's management or employees. The Consultant assume that the information provided is factual, accurate and accepts no responsibility for any deficiency, misstatement or inaccuracies contained in this report as a result of omission or misrepresentation of any person interviewed or contacted. However, the consultant notifies the contradictions and errors in the data, where it seems appropriate.

It should be recognized that the information given in the report is time specific and with the passage of time the relevancy of data and analysis may suffer. Specific circumstances and condition of site can change due to which conclusion and opinions may also change.

## **1.12 Acknowledgement**

The EIA report has been prepared basically with the support from **Kishan Accumulators Ltd.** authority and from various government agencies including Bangladesh Meteorological Department (BMD), Soil Resource Development Institute (SRDI), Bangladesh Bureau of Statistics (BBS), Bangladesh Water Development Board (BWDB), Department of Environment (DoE) and Department of Agriculture Extension (DAE), Disaster Management Bureau (DMB), Bangladesh, BBS etc.

**CHAPTER 02**

**POLICY AND LEGAL  
CONSIDERATIONS**

## **2. POLICY AND LEGAL CONSIDERATIONS**

In Bangladesh, development projects are governed directly or indirectly by some type of legal and/or institutional requirements. Assessment of policy, strategy and regulatory issues are extremely important for any project proponent or developer before they physically execute a Program or Plan. The proponent has to be well aware of these requirements and comply with the provisions as applicable and necessary. The following sections review the relevant National Legislative, Regulatory and Policy Requirements.

### **2.1 Environmental Compliance, Bangladesh**

Bangladesh is one of the least developed countries with a low resource base, a burgeoning population with a very low land-man ratio, often threatened by both natural & anthropogenic stresses. Like all other nations of the world Bangladesh also acted to the global call for the protection and conservation of natural environment & ecology. Industrial development significantly contributes towards economic growth of a country. It brings along with it a host of environmental problem too. It is increasingly being recognized in Bangladesh as in other part of the world that for development to be meaningful & sustainable over a longer period environmental concern must be integrated into all development policies.

The Ministry of Environment, Forest and Climate Change is the nodal ministry that supervises the implementation of environmental and forestry programs in Bangladesh. The Department of Environment (DoE) carries out policy analysis, planning and evaluation, program coordination, and monitoring and evaluation of the environmental programs. The Forest Department in the ministry deals with the forestry programs.

In Bangladesh, the environmental aspects of any project are mainly governed by the Environmental Conservation Act, 1995, the Environmental Conservation Rules, 2023 and the Forest Act, 1927 (if forestland has been converted). The requirement for undertaking environmental studies has been specified under the ECA, 1995 and the ECR, 2023.

Section 12 of ECA, 1995 stipulates that "No industrial unit or project shall be established or undertaken without obtaining environmental clearance from the Director General, Department of Environment (DG, DoE) in the manner prescribed by the rules".

## **2.2 Relevant Major National Environmental Acts, Policies and Rules**

Including ECA, 1995 and the ECR, 2023, depending on applicability, the entrepreneur has to adhere to and may require taking approvals of other previous and existing policies, ordinances, acts and rules.

### **2.2.1 The National Conservation Strategy**

National Conservation Strategy (GoB/IUCN, 1992) was drafted in late 1991 and submitted to the Government in early 1992. For sustainable development in industrial sector, the report offered various recommendations; some of those are as follows:

- ✓ Industries based on nonrenewable resources should be made to adopt technology which conserves raw materials, and existing industries should be given incentives to install technical fixes to reduce wastage rate.
- ✓ All industries, especially those based on imported raw materials, should be subjected to EIA and adoption of pollution prevention/control technologies should be enforced.
- ✓ No hazardous or toxic materials/wastes should be imported for use as raw material.
- ✓ Import of appropriate and environmentally sound technology should be ensured.
- ✓ Complete dependence on imported technology & machinery for industrial development should gradually be reduced so that industrial development is sustainable with local skills and resources.

### **2.2.2 National Environmental Policy (NEP), 2018**

In 2018 the National Environmental Policy (NEP) was drawn up for second time with the aim of providing protection and sustainable management of the environment. The objectives of the Policy include:

- ✓ Maintaining ecological balance and overall development through protection and improvement of the environment;
- ✓ Identifying and regulating polluting and environmentally degrading activities;
- ✓ Ensuring environmentally sound development;
- ✓ Ensuring sustainable and environmentally sound use of all natural resources;
- ✓ Active association with all international environmental initiatives.

### **2.2.3 The National Environmental Management Plan (NEMAP), 1995**

The National Environmental Management Plan (NEMAP) was developed as the framework of programs and interventions aimed at implementing NEP. Under this Plan, various program outlines were drawn up and activities incorporated. The main aims of the Plan were:

- ✓ Better management of scarce resources;
- ✓ Checking the rate of environmental degradation;
- ✓ Improving the natural and manmade environment;
- ✓ Conserving habitats and biodiversity;
- ✓ Promoting sustainable development; and
- ✓ Improving quality indicators of human life.

### **2.2.4 The Environmental Conservation Act, 1995 (Including Amendments 2010)**

The Bangladesh Environmental Conservation Act of 1995, an umbrella legislation enacted to provide for conservation of the environment, improvement of environmental standards and control and mitigation of environmental pollution. The DoE was created under the Act. The provisions of the Act authorize the Director General (DG) of Department of Environment to undertake any activity he deems fit and necessary to conserve and enhance the quality of environment and to control, prevent and mitigate pollution. The main provisions of the Act have been listed in table 2.1.

*Table 2.1: Important Provisions of ECA - 1995*

| Sections  | Provisions                                                                                                                                                                                                                                                                       |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 3 | A Department of Environment, headed by a Director General (DG), should be established by the government for carrying out the purposes of this Act.                                                                                                                               |
| Section 4 | The powers and functions of the DG will include taking necessary measures for conservation and protection of environment and issuing directions to concerned persons, to be carried out within a specified time limit, including that of closure after sending a written notice. |

| Sections     | Provisions                                                                                                                                                                                                                                                     |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 4(A) | The DG or any other authorized person may seek assistance from law-enforcing agencies in case of non-compliance with directions of closure. In such cases, the electricity, gas, telephone and water services for the non-compliant party can be discontinued. |
| Section 5    | The government can declare an area ecologically critical and issue a notice specifying the activities or processes that cannot be initiated or continued in it.                                                                                                |
| Section 6    | This section specifies the restrictions regarding (a) vehicles emitting smoke injurious to environment and (b) manufacture, sale etc. of articles injurious to environment.                                                                                    |
| Section 7    | The DG may seek compensation and/or corrective measures from the concerned person whose act/emission has caused direct/indirect injury to the ecosystem, failing which a civil suit and/or criminal case can be filed in a competent court.                    |
| Section 8    | This section allows a person affected or likely to be affected by environmental pollution or degradation to apply to the DG for remedy.                                                                                                                        |
| Section 9    | The person responsible and the person in charge of the place of occurrence of accidental pollution shall take measures to control or mitigate it, expenses for which are payable to the DG.                                                                    |
| Section 10   | Any person generally or specially authorized by the DG shall have the right to enter any building.                                                                                                                                                             |
| Section 11   | A person authorized by the DG may, in the manner prescribed by rules, collect from any factory, premises or other place any sample of air, water, soil or other substance for analysis.                                                                        |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

| Sections   | Provisions                                                                                                                                                                                         |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section 12 | An Environmental Clearance Certificate must be obtained from the DG for the establishment and undertaking of an industrial project.                                                                |
| Section 13 | The government may formulate and publish environmental guidelines for conservation and improvement of environment and control and mitigation of pollution.                                         |
| Section 14 | This section allows a person aggrieved by a notice, order or direction issued under this Act to appeal to the appellate authority constituted by the government, within 30 days from its issuance. |
| Section 15 | This section specifies the penalty to be paid for various offences.                                                                                                                                |
| Section 16 | When a company violates any provision of this Act or fails to perform its duties in accordance with a notice issued under this Act or the Rules, it will amount to a violation.                    |
| Section 17 | This section introduces the grounds for taking cognizance of an offence and claim for compensation by a court.                                                                                     |
| Section 18 | An action taken by the government or the DG, which caused or is likely to cause injury to any person, cannot be legally contested, if taken in good faith.                                         |
| Section 19 | The government may delegate its powers to the DG, who may delegate his to any other officer of the department.                                                                                     |
| Section 20 | The government is vested with the power to make various rules for carrying out the purposes of this Act.                                                                                           |

### **2.2.5 The Environmental Conservation Rules (ECR), 2023**

The Environment Conservation Rules, 2023 are the set of rules promulgated under the Environment Conservation Act, 1995. ECR, 23 provide additional guidance for specific components of the Act. The rules mainly consist of:

- ✓ The national Environmental Quality Standards (EQS) for surface water, groundwater, drinking water, industrial effluents;
- ✓ Categorization of industries, development projects and other activities on the basis of pollution activities of the existing or proposed industries/development projects/activities.
- ✓ Procedure for obtaining environmental clearance;
- ✓ Requirement for undertaking IEE and EIA as well as formulating EMP according to categories of industries/development projects/activities;
- ✓ Procedure for damage-claim by persons affected or likely to be affected due to polluting activities or activities causing hindrance to normal civic life.

The Rules incorporate "inclusion lists" of projects requiring varying degrees of environmental investigation.

**Green:** Industries/development projects/activities are considered relatively pollution-free and therefore do not require any study about environmental pollution regarding the project. So no Site Clearance needed. Only Environmental Clearance Certificate (ECC) needed for Project establishment.

**Yellow:** Industries/development projects/activities are considered medium pollution and therefore the project has medium health impact and scope taking impact reducing measures. So requires Site Clearance Certificate and Environmental Clearance Certificate (ECC) for Project establishment.

**Orange:** Industries/development projects/activities which fall in ORANGE category are those which may cause significant adverse environmental impacts and are therefore required to submit an EIA report for reducing impact management in environment friendly way. So requires Site Clearance Certificate and Environmental Clearance Certificate (ECC) for Project establishment.

**Red:** Industries/development projects/activities which fall in RED category are those which may cause significant adverse environmental impacts and are therefore required to submit an EIA report. It should be noted that they might obtain an environmental site clearance on the basis of an IEE report and ToR, and subsequently submit an EIA report for obtaining environmental clearance along with other necessary papers.

Certain criteria and conditions have also been established by the Department of Environment (DoE) for siting an industrial plant or project. These are as follows:

- ✓ Location of the industry should be in an area that is/will be designated as an industrial zone, under the town and country planning regulations.
- ✓ While selecting sites for red and orange categories, a few considerations are to be kept in mind environmentally/ otherwise sensitive areas: nearest human settlement highway/railway boundary and high tide line (coastal regions) or natural/modified flood plain boundary.
- ✓ Forest land and prime agricultural land should be avoided as far as practicable.
- ✓ The plant should adequately provide for storage of solid wastes, treatment of wastewater, use of treated wastewater (if feasible) and a green belt around the perimeter.
- ✓ Highly polluting industrial plants should not be located in the vicinity of a recharge area /aquifer, catchment area of public water supply reservoir, habitat of an endangered species, areas prone to floods/earthquakes and areas of frequent inversions.
- ✓ Other factors also need to be considered like induced growth around the industrial site, views of the likely project-affected people, and effects on availability of existing infrastructural facilities to the local population, and assimilative capacity of the receiving body of water.
- ✓ It is advisable to shortlist a few potential sites keeping in mind the above criteria, and then select a site with the minimal environmental impacts.

**Environmental standards** in operation in Bangladesh is also Promulgated under the Environment Conservation Rules 2023. There are standards prescribed for varying water sources, industrial effluent and emission discharges, vehicular Emission etc.

The Bangladesh standards intend to impose restrictions on the volume and concentrations of wastewater/solid waste/gaseous emission etc. discharged into the environment. In addition a number of surrogate pollution parameters like Biochemical Oxygen Demand, or Chemical Oxygen Demand; Total Suspended Solids, etc. are specified in terms of concentration and/or total allowable quality discharged in case of waste water/solid waste. Additionally, specific parameters depending on the manufacturing process are specified such as phenol, cyanide, copper, zinc, chromium etc. Air emission quality standards refer mostly to concentration of mass emission of various types of particulates, sulfur dioxide, and oxides of nitrogen and in some cases volatile organic compounds and other substances.

The Bangladesh standards in general are less stringent compared to the developed countries. This is in view to promote and encourage industrialization in the country. The Bangladesh standards are not for any specific period of time. There is no provision for partial compliance too.

#### ***2.2.6 The Environment Court Act, 2010***

The Environment Court Act, 2010 of Bangladesh was enacted to strengthen environmental governance by replacing the earlier 2000 Act. It provides for the establishment of special Environment Courts in different districts, presided over by District or Additional District Judges, to deal exclusively with offences under the Environment Conservation Act, 1995 and related rules. Cases can be filed only by the Director General of the Department of Environment (DoE) or an authorized officer, while citizens may lodge complaints through the DoE. The courts have the authority to impose fines, imprisonment, compensation, or order closure/relocation of polluting industries. Appeals against verdicts lie with the Environment Appellate Court, headed by a High Court Judge. This Act plays a vital role in ensuring accountability for polluters and promoting environmental justice in Bangladesh.

#### ***2.2.7 Noise Pollution (Control) Rules, 2006***

The Rules attempted to come up with detailed standards on noise pollution and the degree of acceptable noise across the country. The rules have clustered five types of areas, i.e., silent areas, residential areas, mixed areas, commercial areas, and industrial areas. Then, with a few exceptions, the allowable noise levels were set, which were applicable both during the day and at night.

The Noise Pollution (Control) Rules 2006 says that the acceptable sound limit in the silent areas is 50dB for the daytime and 40dB for night; in residential areas 55dB for day and 45dB for night; in the mixed areas 60dB for day and 50dB for night; in commercial areas 70dB for day and 60dB for night; and in the industrial areas 75dB for day and 70dB for night.

In industrial areas, where the highest noise levels are permitted, the limit is 75 decibels at day and 70 decibels at night. In the explanation of the rules, it has been mentioned that hours between 6 am and 9 pm is considered as daytime while the remaining hours are considered as night-time. The guidelines say exceeding the maximum noise level in certain areas is a punishable offence.

### ***2.2.8 Bangladesh Biodiversity Act, 2017***

This Act, consisting of nine Chapters, regulates the Biodiversity conservation and sustainable use of its resources, biota and the fair and equitable share of the benefits derived from their use of and other matters. The Act is divided into the following sectors: Biodiversity and related activities undertaken and transfer restrictions, approved and rejected applications; Functions of the National and Technical Committees on Biological Diversity; Biodiversity management teams, associations and sub-committees, etc.; Biota fair share distribution; Biodiversity strategy and action plan, traditional activities causing adverse effects on biodiversity, etc.; Fund, accounting and audit and Annual Report; Crime, investigation, trial and punishment; and Miscellaneous.

### ***2.2.9 Solid Waste Management Rules, 2021***

The Regulations define the responsibilities of businesses involved in solid waste management and impose collection, recycling, and disposal obligations according to Extended Producer Responsibility (EPR) on manufacturers of non-biodegradable products such as glass, plastic, and bottles. The Regulations also include provisions for the treatment of solid waste such as composting and energy recovery.

The main provisions of the Regulations are as follows:

- ✓ When recovering resources from waste, the principles of management that consider the waste hierarchy, such as the 3Rs, segregation, and reduction, must be followed at all stages from waste generation to final disposal.
- ✓ Responsibilities of waste generators, consumers, and users
  - Dispose of waste in accordance with the regulations of authorities including local government.
  - Dispose of waste separately.
  - Do not dump, store, or burn waste outdoors.
- ✓ Responsibilities of manufacturers and importers of products
  - Collect non-biodegradable products such as glass, plastic, polyethylene, multi-layered packaging, bottles, and cans from consumers and recycle or dispose of them if appropriate.
  - Determine work plans and implementation procedures for recycling and disposal.
  - Ensure that EPR is properly implemented.
  - Submit an annual report to the Department of Environment (DOE) on the amount of plastic recycled.
  - Raise public awareness of proper waste management.

The Regulations also include provisions for the treatment of solid waste such as composting and energy recovery.

### **2.2.10 Air Pollution (Control) Rules, 2022**

Air pollution (Control) rules formulated with the objective of preventing, controlling and reducing air pollution in order to protect the environment and public health.

Key features of the Regulations are as follows:

- ✓ The Rules stipulate environmental air quality standards (general standards), emission standards for vehicles, emission standards applicable to industries or projects, and odor.

- ✓ After the promulgation of the Rules, the Department of Environment (DoE) shall prepare a National Air Quality Management Plan that includes an organizational working framework and efficient management of indoor air quality. When preparing the National Air Quality Management Plan, the standards and methods specified in the rules shall be followed.
- ✓ The DoE shall prepare and publish a list of industries, projects, and activities that are harmful to the environment and human health. For the industries and activities included in the list, the DoE shall establish emission standards and conditions for management as appropriate.
- ✓ In order to control air pollution from motor vehicles, the regulatory authority for motor vehicles shall comply with the standards and control methods specified in the Rules and follow the work procedures recommended in the National Air Quality Management Plan.
- ✓ The DoE may inspect the emissions of motor vehicles and restrict the movement of old motor vehicles that give off emissions exceeding the standards. The DoE may also regulate and prohibit certain engines in order to enforce the standards and control methods specified in the Rules.
- ✓ Local government organizations, construction management authorities, and other relevant organizations shall comply with the standards and control methods specified in the Rules and follow the work procedures recommended in the National Air Quality Management Plan.
- ✓ The Rules also provide for the prevention of air pollution from hazardous waste, excessive emissions of air pollutants, air quality monitoring and warning, data management, establishment of a national executive committee for air pollution control, measures to prevent damage to ecosystems caused by air pollution, awards for contributions to air pollution control, and penalties for violations.

### **2.3 Other Relevant National Acts, Policies and Rules**

Any industry in the country is also required to comply with the industrial and export/import policy of the country. The industry is also required to comply with the Factories and Establishment Act and to undertake the license from concerned licensing authority.

In addition to the above National rules and regulations the project authority in its operational phase must comply with other national acts, policies and rules, some of those are as follows:

### **2.3.1 The Boilers Act, 1923**

This requires that, no owner of boiler shall use the boiler or permit it to be used, unless it has been registered in accordance with the provisions of this act. The Act mentions, among other things, that, the authorizing certificate ceases to be in force when any accident occurs to the boiler, when any structural alternation is made.

The punishment is Taka ten thousand and may be extendable to taka two thousand per day for the period of violation. The boiler user cannot use the boiler does not rest without the certificate, but also at a higher pressure than allowed. The boiler owner is to inform the inspector within twenty-four hours in case of any accident.

The penal code 1860 (Chapter XIV of offences affective the public health, safety, convenience, decency and morals).

#### **Article 277: Failing Water or public spring or Reservoir-**

Whoever voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render it less fit for the purpose for which it is ordinarily used, shall be punished with imprisonment of either description for a term which it is ordinary used, shall be punished with imprisonment of either description for a term which may extend to three months, or with fine which may extend to five hundred taka or with both.

#### **Article 284: Negligent Conduct with Respect to Poisonous Substance-**

Whoever does, with any poisonous substance, any act in a manner so rash or negligent as to endanger human life, or to be likely to cause hurt injury to any person, or knowingly or negligently omits to take such order with any poisonous substance in his possession as is sufficient to guard against probable danger to human life from such poisonous substance, shall be punished with imprisonment of either description for term which may extend to six months, or with fine, which may extend to one thousand taka, or with both.

#### **Article 285: Negligent Conduct with Respect to Fire or Combustible Matter-**

Whoever does, with fire or any combustible matter, any act so rashly or negligently as to endanger human life, or to be likely to cause hurt or injury to any other person, or knowingly or negligently omits to take such order with any fire or any combustible matter in his possession

as is sufficient to guard against probable danger to human life from such fire or combustible matter, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to one thousand taka, or with both.

**Article 286:** Negligent Conduct with Respect to Explosive Substance-

Whoever does, with fire or any explosive, any act so rashly or negligently as to endanger human life, or to be likely to cause hurt or injury to any other person, or knowingly or negligently omits to take such order with any explosive substance in his possession as is sufficient to guard against any probable danger to human life from that substance, shall be punished with imprisonment of either description for a term which may extend to one thousand taka, or with both.

**2.3.2 The Factory Act, 1965**

This is an act to repeal and with certain amendments, re-enact the Factories Act, 1934. This Act requires section 12(I) that “every factory shall be kept clean and free from effluvia arising from any drain privy or other nuisance and in particular accumulation of dirt and refuse shall be remove daily”. Section 13(I) specify that, “effective arrangement shall be made in every factory for the disposal of wastes and effluent due to the manufacturing process carried ion therein”.

Further section 14(I) mentions that, effective and suitable provision shall be made in every factory for securing and maintaining every work-room-

- a) Adequate ventilation by the circulation of fresh air, and
- b) Such temperature as will secure to worker therein reasonable conditions of comfort and prevent injury to health, and in particular-
  - i) The walls and roofs shall be of such materials and so designed that such temperature shall not be exceeded but kept as low as practicable;
  - ii) Where the nature of the work carried on in the factory involves, or is likely to involve, the production of excessively high temperature, such adequate measures as are practicable, shall be taken to protect the workers therefore by separating the process which produces such temperature from the work-room by insulting the hot parts or by other effective means.

**Section 15.1** of the Act stipulates,

- i) In every factory in which, by reason of the manufacturing process carried on, there is given off any dust or fume or other impurity of such a nature and to such an extent as is likely to be injurious or offensives to the workers employed therein, effective measures shall be taken to prevent its accumulation in any workroom and its inhalation by workers, and if any exhaust appliance is necessary for this purpose, it shall be applied as near as possible to the point of origin of the dust, fume or other impurity, and such point shall be enclosed so far as possible.
- ii) In any factory no stationary internal combustion engine shall be operated unless the exhaust is conducted into open air, and no internal combustion engine shall be operated in any room unless effective measures have been taken to prevent such accumulation of fumes there from as are likely to be injurious to the workers employed in the workroom.

Further, **section 17** asks for workspace requirement.

- 1) No work room in any factory shall be overcrowded to an extent injurious to the health of the workers employed there in.
- 2) Without prejudice to the generally of the provision of sub-section (1) there shall be provided for every worker employed in a work –room.
  - a) At least three hundred fifty cubic feet to space in the case of a factory in existence on the date of the commencement of this Act; and
  - b) At least five hundred cubic feet of space in the case of a factory built after the commencement of this Act.

In every factory-

Sufficient latrines and urinals of prescribed types shall be always provided conveniently situated and accessible to workers while they are in the factory. In every factory the following shall be securely fenced by the safeguards of substantial construction which shall be kept in position while the parts of machinery required to be fenced are in motion or in use, namely-

- a) Every moving part of a prime mover, and every fly wheel connected to a prime mover;
- b) The head face and tailrace of every water wheel and water turbine;
- c) Any part of a stock bar which projects beyond the head stock of a lathe; and
- d) Unless they are in such position or of such construction as to be as safe to every person employed in the factory as they would be if they were securely fenced-
  - i. Every part of an electric generator. a motor or rotary converter;

- ii. Every part of transmission machinery; and
- iii. Every dangerous part of any machinery.

Where in any factory any manufacturing process produces dust, gas, fume or vapor of such character and to such extent as to be likely to explode on ignition, all practicable measures shall be taken to prevent any such explosion by-

- a) Effective enclosure or the plant or machinery used in the process;
- b) Removal or prevention of the accumulation of such dust, gas, fume or vapor;
- c) Exclusion or effective enclosure of all possible sources of ignition.

### ***2.3.3 The Forest Policy, 1994***

The National Forest Policy of 1994 is the amended and revised version of the National Forest Policy of 1977 in the light of the National Forestry Master Plan. The major target of the policy is to conserve the existing forest areas and bring about 20% of the country's land area under the forestation Program and increase the reserve forest land by 10% by the year 2015 through coordinated efforts of GO-NGOs and active participation of the people.

Amendments of the existing laws (acts, rules and regulations) relating to the forestry sector and creation of new laws for sectoral activities have been recognized as important conditions for achieving the policy goals and objectives. The Forestry Policy also recognizes the importance of fulfilling the, responsibilities and commitments under International Conventions, Treaties and Protocols (ICTPs).

### ***2.3.4 Industrial Policy, 1999***

The national industrial policy, 1999 aims to ensure a high rate of investments by the public and private sectors, a strong productive sector, direct foreign investment, development of labor-intensive industries, introduction of new appropriate technology, women's participation, development of small and cottage industries, entrepreneurship development, high growth of support, infrastructure development and environmentally sound industrial development.

WTO guidelines have been proposed to be followed in the industrial policy. Following the guidelines, may result in conflicts with intellectual property rights. Guidelines for mitigating such possible conflicts are absent in the policy document. No specific guidelines are given for sustainable extraction and utilization of raw materials for different industries. One of the 17

objectives of the policy (Section 2.12; Chapter II) is "To ensure a process of industrialization which is environmentally sound and consistent with the resource endowment of the country". However, none of the 24 strategies of the policy relate to the environment.

### ***2.3.5 The Building Construction Act, 1952***

An act to provide for the prevention of haphazard construction of buildings and excavation of tanks which are likely to interfere with the planning of certain areas in Bangladesh. Whereas it is expedient to provide for the prevention of haphazard construction of buildings and excavation of tanks and cutting of hills which are likely to interfere with the planning of certain areas in Bangladesh.

It is hereby enacted as follows: -

- ✓ It extends to the whole of Bangladesh.
- ✓ It shall come into force, -
  - In the areas to which Notification No. 2306 L.S.-G, dated the 26th July, 1951, relates, on and from the date on which the East Bengal Building Construction Ordinance, 1951, as enacted and continued in operation by the East Bengal Expiring Laws Act, 1951, ceases to operate; and
  - In other areas, on and from such dates as the Government may, by notification in the Official Gazette, direct.

The Government may, by notification in the Official Gazette, withdraw the operation of this Act from any area.

### ***2.3.6 Bangladesh Building Construction Rules, 2008***

These rules superseded the previous Building Construction (BC) rules of 1984. These rules seek to control development plot-by-plot and case-by-case. It controls development by imposing conditions on setbacks, site coverage, construction of garages, access to plot, provision of lift, land use of that particular plot and height of building. Restricting the height of a building in BC Rules 1996 helps to control the density of an area and manage the growth of the city in some way.

The Dhaka Metropolitan Building Construction Rules 2008 superseded the earlier set of rules issued in 1996 for the Dhaka Metropolitan Area and provided more authority to RAJUK in the following way:

- ✓ Clear-cut responsibility to monitor the development of the city,
- ✓ Spread out the responsibilities to various actors,
- ✓ Spelled out responsibilities of building designers, structural engineers, site supervisors and their penalties etc.

One of the most significant improvements is the introduction of Floor Area Ratio (FAR). To manage the growth of the city it provides rules of building coverage area, allowable floor space and relation among building height - road width and plot size.

Effectiveness of the new BCR rules will depend on how successfully implementation of these rules can be affected by RAJUK in a transparent way and keeping themselves away from corruption.

### ***2.3.7 Bangladesh Wildlife Preservation Act (1973; Amended in 1974)***

The Bangladesh Wildlife (Preservation) Act of 1973 provides for the preservation, conservation and management of wildlife in Bangladesh. The earlier laws on wildlife preservation, namely, the Elephant Preservation Act 1879, the Wild Bird and Animals Protection Act 1912, and the Rhinoceros Preservation Act 1932 have been repeated and their provisions have been suitably incorporated in this law.

This Act encompasses a range of different activities including hunting and fishing although the provisions of greatest significance relate to the establishment of National Parks, Wildlife Sanctuaries and Game Reserves by the Ministry of Environment, Forest and Climate Change (MoEFCC). Such designations have enormous significance for the types of developments that may take place.

This legislation does not provide scope for creation of a strong organization, which can adopt appropriate measures to protect wildlife. The importance of wildlife could have been highlighted in the legislation, which it does not do. Punitive provisions are not readily usable. The types of endangered and ecologically valuable animals/birds could have been highlighted in the legislation. It should have asked for active participation and specific action from local

administration to protect wildlife. It also does not prescribe seasons when certain animal/birds cannot be hunted or captured.

An executive order issued in June 1998, in relation to the Bangladesh Wildlife Preservation Order of 1973 has imposed a ban for the next five years on hunting of any form of wildlife.

### ***2.3.8 The Acquisition and Requisition of Immovable Property Ordinance, 1982***

This Ordinance has replaced the Land Acquisition Act of 1894 and the East Bengal (Emergency) Requisition of Property Act of 1948. The Ordinance governs acquisition and requisition by the government of immovable property for any public purpose or in the public interest. It may be noted that contrary to the previous Acts (i.e. Act XIII of 1948), this Ordinance deals only with immovable property.

The Ordinance has well-defined procedures regarding payment of compensation for an acquired piece of land. If, for example, the land is used for rice growing, then an amount equivalent to approximately 1.5 times the market value of a given variety of rice (e.g., paddy) that is currently being (or could be) produced annually is fixed as a yearly lease value. In case of outright purchase (carried out on a 99-year lease), the compensation-value of acquired land varies widely according to the locality, soil fertility, and access to transportation and related infrastructure factors. The current compensation and resettlement provisions are however inadequate both in terms of timing of payments and quantum. The procedures involved are cumbersome and time consuming and often causes hindrance to the smooth execution of the project. Legal provisions covering adequate compensation to the project affected persons, particularly disadvantaged groups such as women & squatters and such other vulnerable groups are yet to be framed.

### ***2.3.9 The Protection and Conservation of Fish Rules, 1985***

These are a set of rules in line with the overall objectives of the Fish Act. Section 5 of the Rules requires that "No person shall destroy or make any attempt to destroy any fish by explosives, gun, bow and arrow in inland waters or within coastal waters". Section 6 of the Rules states that, - "No person shall destroy or make any attempt to destroy any fish by poisoning of water or the depletion of fisheries by pollution, by trade effluents or otherwise in inland waters".

### **2.3.10 National Water Policy, 1999**

The National Water Policy of 1999 was passed to ensure efficient and equitable management of water resources, proper harnessing and development of surface and ground water, availability of water to all concerned and institutional capacity building for water resource management. It has also addressed issues like river basin management, water rights and allocation, public and private investment, water supply and sanitation and water need for agriculture, industry, fisheries, wildlife, navigation, recreation, environment, preservation of wetlands, etc.

### **2.3.11 Standards for Air, Water and Sound**

*Table 2.2: Standards for Drinking Water*

| Sl. | Parameter                                         | Unit       | Standards |
|-----|---------------------------------------------------|------------|-----------|
| 1.  | Fecal Coliform                                    | CFU/100 ml | 0         |
| 2.  | Total Coliform                                    | "          | 0         |
| 3.  | Free Residual Chlorine                            | mg/l       | 0.2       |
| 4.  | Nitrate                                           | "          | 45        |
| 5.  | As                                                | "          | 0.05      |
| 6.  | Turbidity                                         | NTU        | 5         |
| 7.  | Al                                                | mg/l       | 0.2       |
| 8.  | NH <sub>3</sub>                                   | "          | 1.5       |
| 9.  | Ba                                                | "          | 0.7       |
| 10. | C <sub>6</sub> H <sub>6</sub>                     | "          | 0.01      |
| 11. | B                                                 | "          | 1.0       |
| 12. | Cd                                                | "          | 0.003     |
| 13. | Ca                                                | "          | 75        |
| 14. | Chloride                                          | "          | 250*      |
| 15. | CCl <sub>4</sub>                                  | "          | 0.005     |
| 16. | 1,1-C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> | "          | 0.03      |
| 17. | 1,2-C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> | "          | 0.03      |
| 18. | C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub>     | "          | 0.04      |
| 19. | C <sub>2</sub> H <sub>3</sub> Cl <sub>4</sub>     | "          | 0.02      |
| 20. | Pentachlorophenol                                 | "          | 0.009     |
| 21. | 2,4,6 Trichlorophenol                             | "          | 0.2       |
| 22. | CHCl <sub>3</sub>                                 | "          | 0.09      |
| 23. | Total Cr                                          | "          | 0.05      |
| 24. | Color                                             | Hazen      | 15        |
| 25. | Cu                                                | mg/l       | 1.5       |
| 26. | CN                                                | mg/l       | 0.05      |
| 27. | Fluoride                                          | mg/l       | 1.0       |
| 28. | Hardness as CaCO <sub>3</sub>                     | mg/l       | 500       |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|     |                               |                   |           |
|-----|-------------------------------|-------------------|-----------|
| 29. | Fe                            | "                 | 0.3-1.0   |
| 30. | Total Kjeldahl Nitrogen       | "                 | 1.0       |
| 31. | Pb                            | "                 | 0.01      |
| 32. | Mg                            | "                 | 30-35     |
| 33. | Mn                            | "                 | 0.4       |
| 34. | Hg                            | "                 | 0.001     |
| 35. | Ni                            | "                 | 0.05      |
| 36. | No <sub>2</sub> -             | "                 | 1.0       |
| 37. | Odor                          |                   | Odor Less |
| 38. | Oil & Grease                  | mg/l              | 0.01      |
| 39. | pH                            |                   | 6.5-8.5   |
| 40. | Phenols                       | mg/l              | 0.002     |
| 41. | Potassium                     | "                 | 12        |
| 42. | Total Alpha Radiation         | Bq/l              | 0.1       |
| 43. | Total Beta Radiation          | Bq/l              | 0.1       |
| 44. | Se                            | mg/l              | 0.01      |
| 45. | Ag                            | "                 | 0.02      |
| 46. | Na                            | "                 | 200       |
| 47. | Suspended Solid               | "                 | 10        |
| 48. | Sulfide as H <sub>2</sub> S   | "                 | 0.05      |
| 49. | SO <sub>4</sub> <sup>2-</sup> | "                 | 250       |
| 50. | TDS                           | "                 | 1000      |
| 51. | Temperature                   | Degree Centigrade | 20-30     |
| 52. | Sn                            | mg/l              | 2.0       |
| 53. | Zn                            | "                 | 5.0       |
| 54. | Aldrin and Dieldrin           | "                 | 0.03      |
| 55. | Anionic Detergents            | "                 | 0.2       |

**Source:** *Environmental Conservation Rules, 2023*

*Table 2.3: Standards for Sewage Discharge*

| Parameters                   | Unit               | Standard |
|------------------------------|--------------------|----------|
| <b>BOD</b>                   | mg/l               | 30       |
| <b>COD</b>                   | mg/l               | 125      |
| <b>pH</b>                    | -                  | 6-9      |
| <b>Nitrate</b>               | „                  | 50       |
| <b>Phosphate</b>             | „                  | 15       |
| <b>Suspended solids (SS)</b> | „                  | 100      |
| <b>Temperature</b>           | Degrees centigrade | 30       |
| <b>Coli form</b>             | Number per 100 ml  | 1000     |

***Source:** Schedule 3, Environmental Conservation Rules, 2023*

Notes:

- This limit shall be applicable to discharges into surface and inland waters bodies.
- Sewage shall be chlorinated before final discharge.

*Table 2.4: Standards for Sound*

| Sl. No. | Category for sound                                                                                         | Standards determined (dB unit) |       |
|---------|------------------------------------------------------------------------------------------------------------|--------------------------------|-------|
|         |                                                                                                            | Day                            | Night |
| a.      | Silent Zone (Sensitive areas such as parks, school, hospitals and mosques)                                 | 50                             | 40    |
| b.      | Residential areas                                                                                          | 55                             | 45    |
| c.      | Mixed areas (mainly residential area, and also simultaneously used for commercial and industrial purposes) | 60                             | 50    |
| d.      | Commercial areas                                                                                           | 70                             | 60    |
| e.      | Industrial areas                                                                                           | 75                             | 70    |

**Source:** *The Noise Pollution (Control) Rules, 2025*

Notes:

1. The time from 6 a.m. to 9 p.m. is counted as daytime.
2. The time from 9 p.m. to 6 a.m. is counted as night time.

*Table 2.5: Ambient Air Quality Standards*

| <b>Air Pollutant</b>    | <b>Avg. Time</b> | <b>Parameter/Standard<br/>(Microgram/cubic meter)</b> |
|-------------------------|------------------|-------------------------------------------------------|
| <b>CO</b>               | 8 h              | 5                                                     |
|                         | 1 h              | 20                                                    |
| <b>Pb</b>               | Yearly           | .25                                                   |
|                         | 24 h             | .50                                                   |
| <b>NO<sub>2</sub></b>   | Yearly           | 40                                                    |
|                         | 24 h             | 80                                                    |
| <b>PM<sub>10</sub></b>  | Yearly           | 50                                                    |
|                         | 24 h             | 150                                                   |
| <b>PM<sub>2.5</sub></b> | Yearly           | 35                                                    |
|                         | 24 h             | 65                                                    |
| <b>SO<sub>2</sub></b>   | 1 h              | 250                                                   |
|                         | 24 h             | 80                                                    |
| <b>NH<sub>3</sub></b>   | Yearly           | 100                                                   |
|                         | 24 h             | 400                                                   |

**Source:** Schedule 1, Air Pollution (Control) Rules, 2022

## **2.4 Environmental Clearance Procedure**

In Bangladesh, an Environmental Clearance Certificate (ECC) is required for new or expanding industries, as per the Environment Conservation Rules (ECR), 2023. The project proponent submits an application, along with the required documents and fees (as specified in Schedule 13 of ECR 2023), to the concerned Local Office of the Department of Environment (DoE). The DoE reviews the application, conducts site inspections, and evaluates the submitted EIA report. For certain projects, public consultation is carried out to consider community feedback. Based on this evaluation, the Director General of DoE may issue the ECC with conditions to ensure environmental safeguards. The proponent must then implement the Environmental Management Plan and report regularly on compliance and monitoring. The general procedures for getting ECC are shown in figure 2.

**Steps Involved in Environmental Clearance**

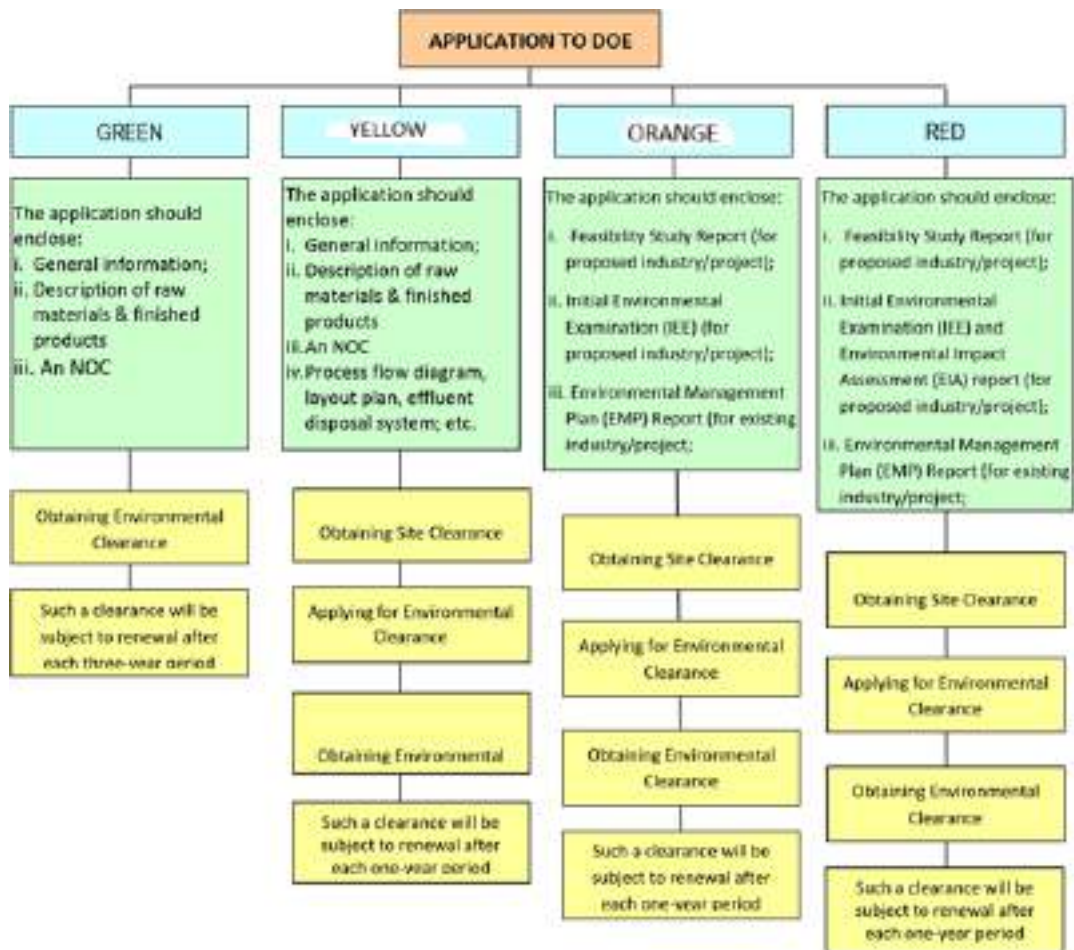


Figure 2.1: Process of Getting Environmental Clearance Certificates

## **CHAPTER 03**

### **DESCRIPTION OF THE PROJECT**

### **3. DESCRIPTION OF THE PROJECT**

#### **3.1 Project Definition**

Kishan Accumulators Ltd. is a proposed Lead Acid Starter Battery (LAS) manufacturing industry to be established at Uzirpur, Bokultola, Narail Sadar, Narail, Bangladesh. The project site is located approximately within the Narail district region and is planned to support the growing demand for automotive and industrial batteries in the country.

The proposed manufacturing facility will utilize modern production technology and machinery for the manufacturing of Lead Acid Starter Batteries (LAS). The production process will include lead grid casting, oxide preparation, plate pasting, curing, assembly, charging, testing, and final packaging operations. The facility will manufacture high-quality batteries suitable for automobiles, generators, backup power systems, and other industrial applications.

The planned production capacity of the proposed project is approximately 1300 battery units per month. Major raw materials required for the project include lead, lead oxide, sulfuric acid, plastic containers, separators, battery covers, and related accessories. The project has been designed considering environmental protection, occupational safety, and efficient resource utilization through installation of pollution control systems such as ETP and ATP, along with implementation of modern environmental management practices.

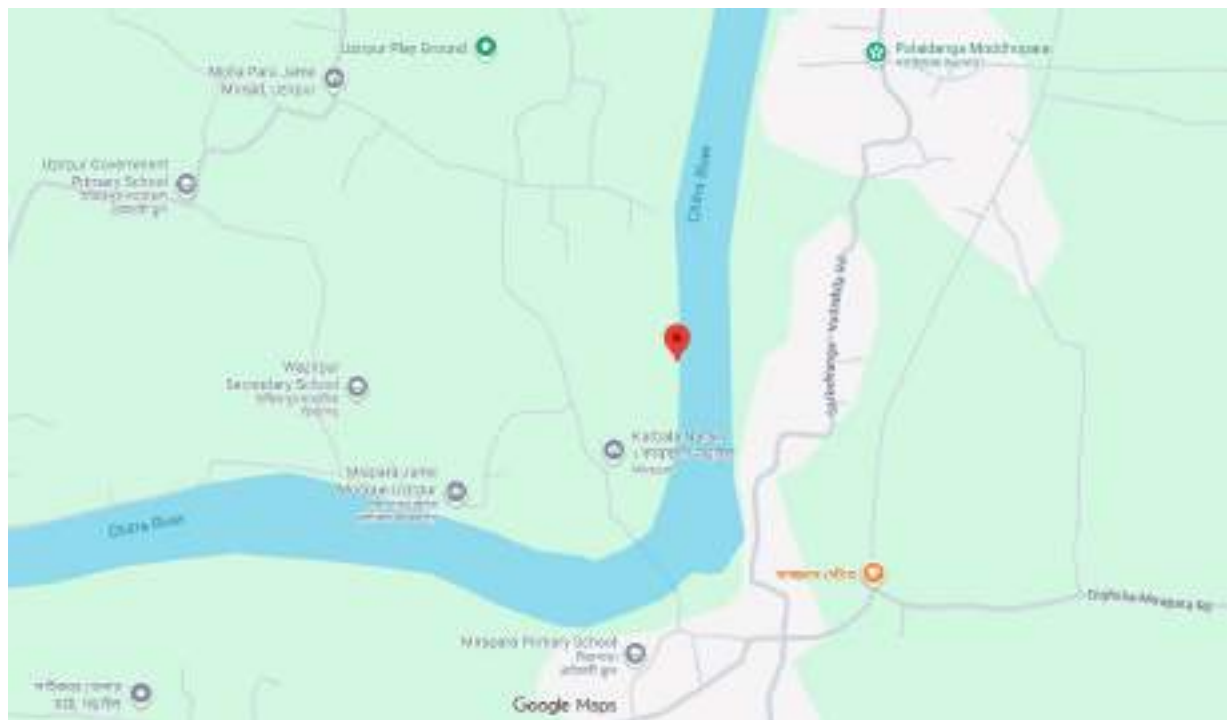
#### **3.2 Study Area**

The project site of Kishan Accumulators Ltd. is located at Uzirpur, Bokultola under Narail Sadar Upazila of Narail District, Bangladesh. The geographical coordinates of the project site are approximately 23.127414° North Latitude and 89.520820° East Longitude. The total land area of the proposed project is about 111 decimals, which has been allocated for factory buildings, utility facilities, internal roads, drainage systems, open spaces, and greenbelt development.

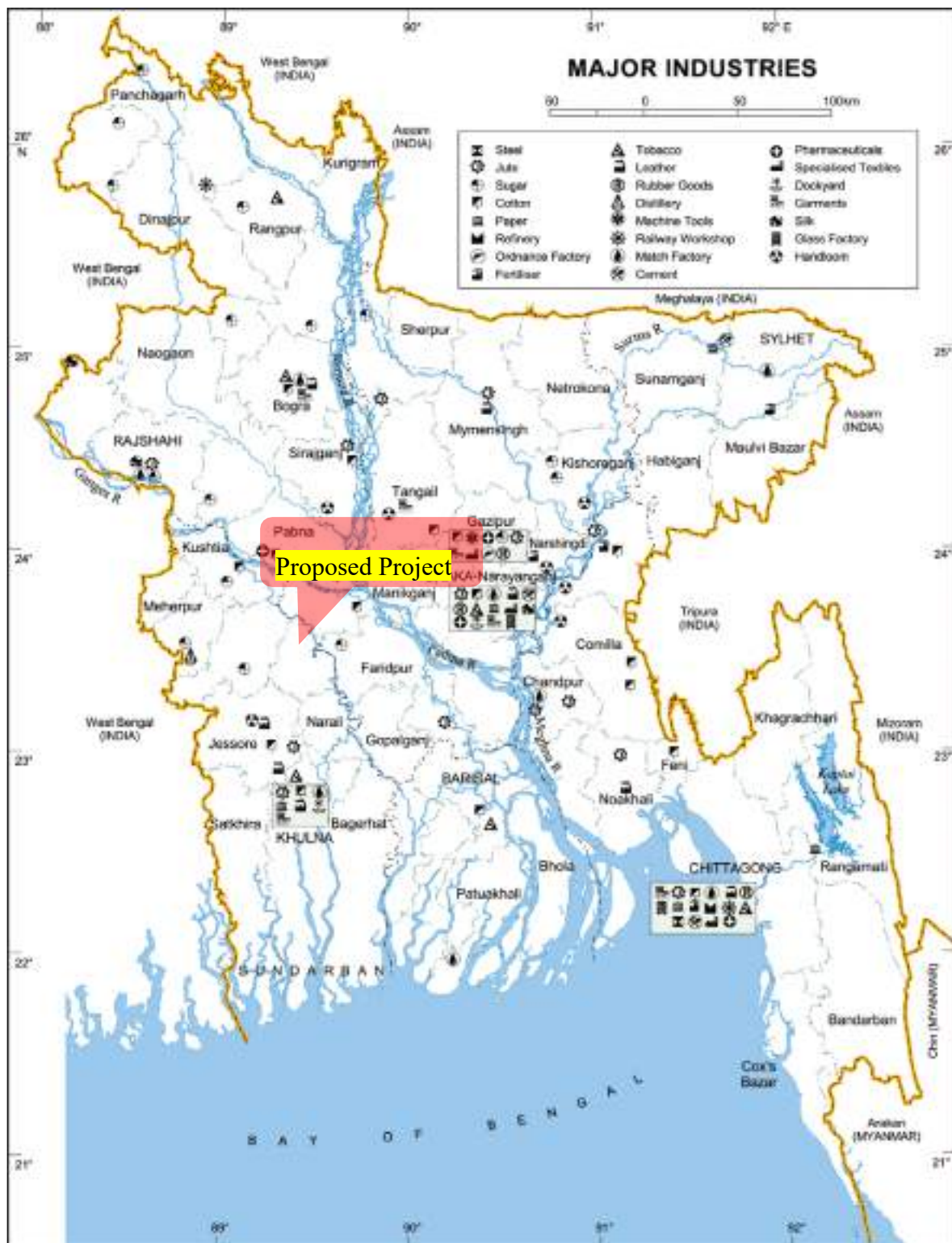
The proposed project site is presently vacant land and does not involve displacement of major settlements or significant land use conflict. Adequate open spaces will be maintained within the premises for plantation and buffer zone development to improve environmental quality and reduce potential impacts from noise, dust, and emissions. The planned greenbelt development reflects the project authority's commitment toward environmentally sustainable industrial operation.

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

The project site has good accessibility through existing local and regional road networks, facilitating transportation of raw materials and finished products. The selected location is considered suitable for industrial development due to availability of transportation facilities, utility access, and compatibility with surrounding land use characteristics. The site selection has also considered environmental and regulatory aspects for obtaining Site Clearance, Environmental Impact Assessment (EIA) approval, and Environmental Clearance Certificate (ECC) from the Department of Environment (DoE), Bangladesh.



*Figure 3.1: Location Map of the Project*



*Figure 3.2: Major Industries in Bangladesh*

### 3.3 Basic Information of the Project

The proposed project of Kishan Accumulators Ltd. is currently under the process of obtaining necessary approvals from the Department of Environment (DoE), Bangladesh. Upon receiving Environmental Impact Assessment (EIA) approval, Site Clearance, and Environmental Clearance Certificate (ECC) from the DoE, construction and subsequent operation of the project will be initiated.

The basic information of the proposed project is presented in Table 3.1.

*Table 3.1: Basic Information of the Project*

| Name of the Project                | Details                              |                                                                                       |
|------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------|
| General Information of the Project | Name of the Project                  | <i>Kishan Accumulators Ltd.</i>                                                       |
|                                    | Project Address                      | <b>Uzirpur, Bokultola, Narail Sadar, Narail</b>                                       |
|                                    | Geographic Coordinate (GPS Location) | <b>23.127414° N, 89.520820° E</b>                                                     |
|                                    | Project Proponent & Designation      | <i>Amaresh Chandra Saha - CEO.</i>                                                    |
|                                    | Cell                                 | <b>+8801711539437</b>                                                                 |
|                                    | Email                                | <b>kishanaccumulationsltd@gmail.com</b>                                               |
|                                    | Raw Materials                        | Lead, Lead Oxide, Sulfuric Acid, Plastic Containers, Separators, Battery Covers, etc. |
|                                    | Final Product                        | Lead Acid Starter Battery (LAS)                                                       |
|                                    | Project Operation                    | Battery Manufacturing                                                                 |

|                                          |                                               |                          |
|------------------------------------------|-----------------------------------------------|--------------------------|
|                                          | Production Capacity                           | 1300 Units / Month       |
|                                          | Source of Raw Materials                       | Local Market (Initially) |
|                                          | Raw Materials Required                        | 6000 kg/month            |
|                                          | Total Land                                    | 111 Decimal              |
|                                          | Estimated Investment (TK)                     | 45,529,000               |
|                                          | Present Land Use                              | Null                     |
|                                          | Present Land Use Picture                      | Section-8                |
|                                          | Manpower                                      | 26 Persons               |
| <b>Utility Details</b>                   | Domestic and Utilities Consumption            | About 24000 L/day        |
|                                          | Industrial WW Generation                      | About 2900 L/day         |
|                                          | Total Water Consumption                       | About 26900 L/day        |
|                                          | Power Source                                  | WZPDCL                   |
|                                          | Power Consumption                             | 800 kW (Load)            |
| <b>Pollution Management - Wastewater</b> | Max Domestic Wastewater and Management Plan   | Septic Tank and Soak Pit |
|                                          | Max Industrial Wastewater and Management Plan | 0.5 m3/hr. Chemical ETP  |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|                               |               |                                                                                    |
|-------------------------------|---------------|------------------------------------------------------------------------------------|
| <b>Proposed Land Premises</b> | North         | Local Road and Bare land                                                           |
|                               | South         | Chitra River                                                                       |
|                               | East          | Bare land                                                                          |
|                               | West          | Bare land                                                                          |
| <b>Annexure Details</b>       | Annexure-I    | Approved ToR, Production Process Flow, List of Machineries & Project Layout Plan   |
|                               | Annexure- II  | Baseline Air, Water and Noise Test Results                                         |
|                               | Annexure- III | Newspaper Advertisement, Public Consultation Meeting Minutes, Attendees of the FGD |
|                               | Annexure- IV  | ETP Drawing & Design                                                               |
|                               | Annexure- V   | Detail APCS Design                                                                 |

### 3.4 Production Process Flow

This production flow chart outlines the comprehensive manufacturing sequence for lead-acid batteries at Kishan Accumulators Ltd. An integrated production process flow is given below:

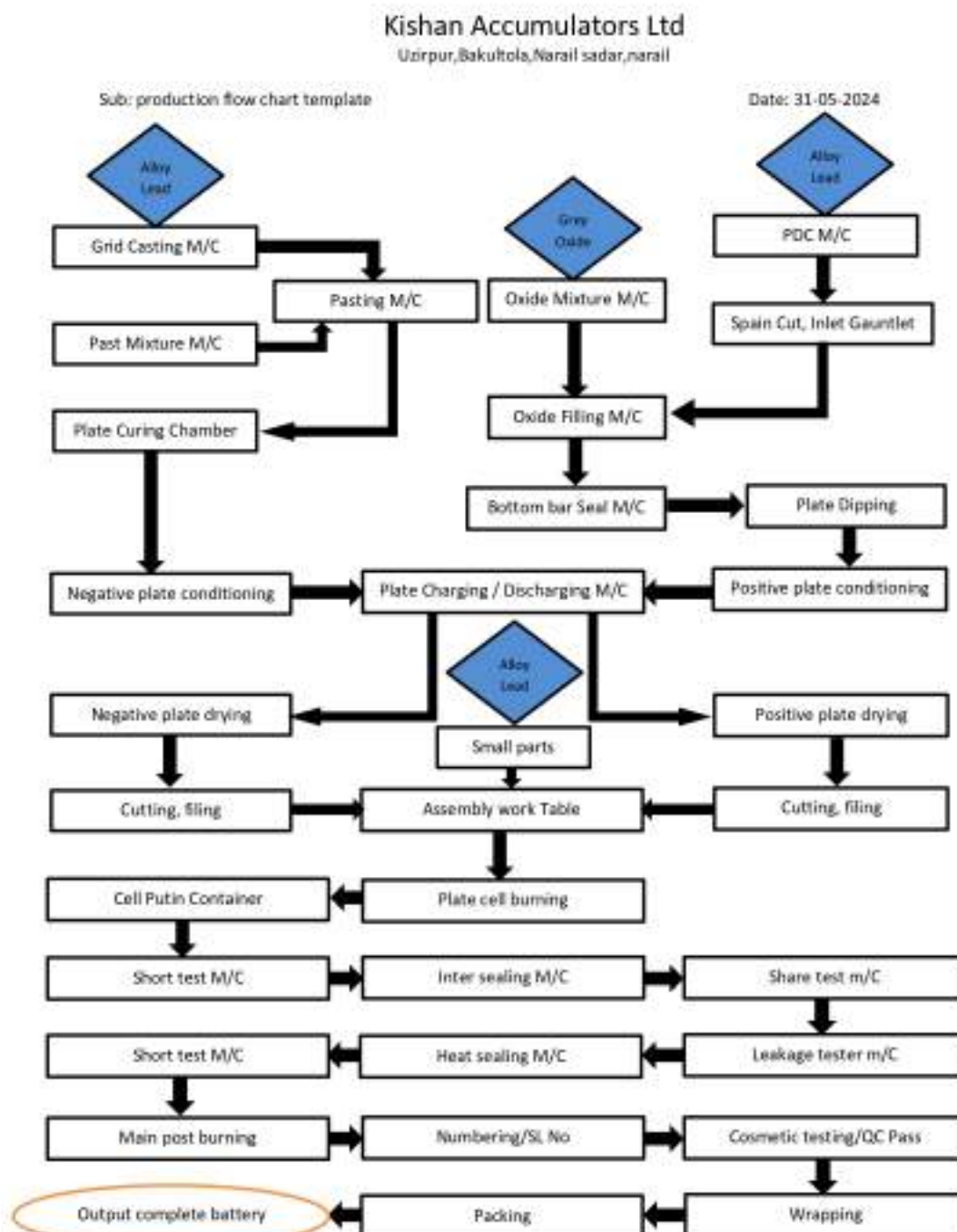


Figure 3.3: Integrated production process flow

### 3.5 Manufacturing Process Description

This production flow chart outlines the comprehensive manufacturing sequence for lead-acid batteries at Kishan Accumulators Ltd. The process integrates the preparation of negative and positive plates through casting, pasting, and curing stages before moving into final cell assembly. It concludes with a rigorous series of structural sealing, electrical testing, and quality control measures to ensure a complete battery output. The battery manufacturing process at Kishan Accumulators Ltd. involves three primary material streams that converge into a final assembly and testing phase.

#### 1. Component Preparation

The process begins with the preparation of three main components:

- **Negative Plates:** Alloy Lead is processed through a **Grid Casting M/C**, then combined with material from a **Past Mixture M/C** at the **Pasting M/C**. These are then sent to the **Plate Curing Chamber**.
- **Positive Plates:** Grey Oxide and Alloy Lead are processed through **Oxide Mixture** and **PDC machines**, eventually moving through **Oxide Filling** and **Bottom bar Seal** stages.
- **Small Parts:** A separate stream of Alloy Lead is used to produce various small internal parts.

#### 2. Conditioning and Assembly

Once the plates are cured and prepared, they undergo specialized treatment:

- **Conditioning:** Both positive and negative plates undergo **conditioning**, followed by a **Plate Charging/Discharging** cycle.
- **Finishing:** Plates are dried, cut, and filed to exact specifications.
- **Assembly:** All components meet at the **Assembly Work Table**, where **Plate cell burning** occurs before the cells are placed into the container.

#### 3. Testing and Final Output

The final stage focuses on structural integrity and quality control:

- **Sealing & Testing:** The unit undergoes **Short tests, inter sealing, and Heat sealing.** It is then checked by a **Share test m/c and Leakage tester.**
- **QC & Packaging:** After **Main post burning** and serial numbering, the battery must pass **Cosmetic testing/QC.**
- **Completion:** The final products are wrapped and packed for distribution as **Output complete batteries.**

### 3.6 List of Machineries

A battery factory utilizes a wide range of specialized machinery to ensure efficient and high-quality battery production. The process starts with electrode preparation machines, including slurry mixers, coating machines, drying ovens, and calendaring equipment to produce anode and cathode sheets. These are followed by cell assembly machines such as cutting machines, stacking or winding machines, tab welding units, and sealing systems. Next, electrolyte filling and sealing machines inject electrolyte and securely seal the battery cells. The batteries then go through formation and aging equipment, where they are charged and discharged under controlled conditions to activate their chemistry. Quality control is ensured using testing and inspection machines like OCV testers, leak detectors, and capacity testers. Finally, packing and labeling machines prepare the finished batteries for shipment. Machineries used for set up this project is depicted in Annexure-I.

- Details Machineries list given in Annexure-I

### 3.7 List of Raw Materials

The major raw materials required for the project include:

- Lead
- Lead Oxide
- Sulfuric Acid
- Plastic Containers
- Battery Separators
- Battery Covers

- Small Battery Components and Connectors

Initially, raw materials will be procured from local suppliers and markets.

### **3.8 Land Use and Site Development**

The total project area is approximately 111 decimals. At present, the land is vacant and does not involve displacement of settlement or major land use conflict. The project site development activities will include land preparation, internal road construction, drainage facilities, factory building construction, utility installation, and greenbelt development. According to the Master Plan, the major construction works will comprise the construction of a three-story building for office and laboratory purposes, along with six single-story steel-framed buildings to be used as production sheds. In addition, several minor utility buildings and ancillary facilities will be constructed to support the overall operation of the project.

Adequate open space and plantation area will be maintained within the project premises to improve environmental quality and reduce noise and dust impacts. The project site peripheral is given below:

| <b><u>Direction</u></b> | <b><u>Adjacent Features / Land Premises</u></b> |
|-------------------------|-------------------------------------------------|
| <b>North</b>            | Local Road and Bare Land                        |
| <b>South</b>            | Chitra River                                    |
| <b>East</b>             | Bare Land                                       |
| <b>West</b>             | Bare Land                                       |

### **3.8 Resource Consumption**

#### **3.8.1 Power and Fuel Consumption of the Project**

The project will require approximately 800 kW (approved load) of electricity, which will be supplied by WZPDCL for operating production machinery, utility systems, lighting, and other ancillary facilities. To ensure uninterrupted operation during power outages, an 800 kVA diesel-powered generator will be installed as a standby power source. In addition, a 1.5 kW solar panel system will be installed to support renewable energy utilization and reduce dependence on conventional power sources. The combination of grid electricity, solar energy, and backup generation will ensure a reliable and continuous power supply for battery manufacturing operations and associated environmental control systems. The estimated power and fuel requirements are outlined below:

*Table 3.2: Power and Fuel Requirement of the Project*

| <b><i>Component</i></b>                     | <b><i>Source</i></b> | <b><i>Unit/Capacity</i></b> |
|---------------------------------------------|----------------------|-----------------------------|
| <b>Electricity</b>                          | WZPDCL               | 800 Kw (Approved Load)      |
| <b>Standby Generator<br/>(Diesel Based)</b> |                      | 800 KVA                     |
| <b>Solar Panel</b>                          |                      | 1.5 kW                      |

### **3.8.2 Water Consumption of the Project**

The detail estimated water consumption of the project is stated below.

*Table 3.3: Calculation of Water Use of the Project*

| <b>Name of Section</b>                                                          | <b>Water Volume per Section/Day (2.0 Shift)</b> | <b>Total Water Volume; m<sup>3</sup> (Per day)</b> | <b>Total Water Consumption</b> |
|---------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|--------------------------------|
| Pasting Section                                                                 | 200 ltr                                         | 0.20                                               | <b>2.9 m<sup>3</sup></b>       |
| Curing Section                                                                  | 500 ltr                                         | 0.50                                               |                                |
| IB section                                                                      | 500 Ltr                                         | 0.50                                               |                                |
| Formation Section                                                               | 500 ltr                                         | 0.50                                               |                                |
| Washing-Drying Section                                                          | 500ltr                                          | 0.50                                               |                                |
| VRLA Charging                                                                   | 200 ltr                                         | 0.20                                               |                                |
| Solar Charging                                                                  | 500ltr                                          | 0.50                                               |                                |
| Domestic Purpose (Sewage, cleaning, drinking (RO), canteen, construction, Etc.) | 2000 ltr                                        | 2.00                                               | <b>24 m<sup>3</sup></b>        |
| Fire Fighting purpose                                                           | 20000 ltr                                       | 20.0                                               |                                |
| Utilities purpose                                                               | 1000 ltr                                        | 1.0                                                |                                |
| Others                                                                          | 1000 ltr                                        | 1.0                                                |                                |
| <b>Grand Total</b>                                                              |                                                 |                                                    | <b>26.9 m<sup>3</sup></b>      |

### **3.8.3 Wastewater Generation and Management of the Project**

#### **Industrial Wastewater Generation and Management**

The proposed Lead Acid Starter Battery (LAS) manufacturing facility will generate approximately 2.90 m<sup>3</sup>/day of industrial wastewater from various production sections. Wastewater will primarily originate from the Pasting, Curing, Initial Battery (IB), Formation, Washing-Drying, VRLA Charging, and Solar Charging sections. These activities involve equipment washing, plate processing, battery formation, charging operations, and floor cleaning. Similar wastewater sources are commonly reported in battery manufacturing industries, particularly from pasting, curing, formation, and washing operations.

Among the different sections, the Curing, IB, Formation, Washing-Drying, and Solar Charging units each contribute approximately 0.50 m<sup>3</sup>/day, while the Pasting and VRLA Charging sections generate 0.20 m<sup>3</sup>/day each. The total industrial wastewater generation of the project is estimated at 2.90 m<sup>3</sup>/day, which will be collected and treated through the proposed Effluent Treatment Plant (ETP) prior to reuse or disposal in compliance with environmental regulations.

The estimated industrial wastewater generation from the proposed Lead Acid Starter Battery (LAS) manufacturing facility is 2.90 m<sup>3</sup>/day. However, to accommodate future expansion, flow fluctuations, peak wastewater generation, and operational safety factors, the proposed Chemical ETP has been designed with a treatment capacity of 5.0 m<sup>3</sup>/day. The ETP will operate for 10 hours per day, resulting in a design treatment flow rate of 0.50 m<sup>3</sup>/hour.

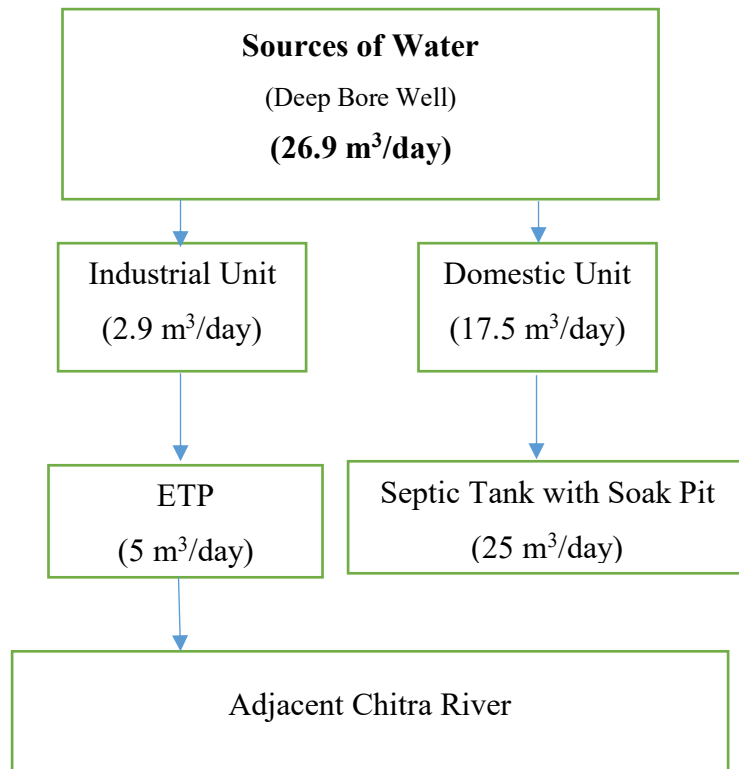
#### **Domestic Water Use and Wastewater Management**

The proposed battery manufacturing facility will require approximately 24.0 m<sup>3</sup>/day of water for domestic and utility purposes. The major water demand will be for firefighting purposes (20.0 m<sup>3</sup>/day), followed by domestic uses such as sanitation, cleaning, drinking water (RO), canteen facilities, and construction activities (2.0 m<sup>3</sup>/day). In addition, 1.0 m<sup>3</sup>/day will be required for utility purposes and 1.0 m<sup>3</sup>/day for other miscellaneous activities.

Domestic wastewater generated from sanitary facilities and other non-industrial activities will be managed through a Septic Tank and Soak Pit System. The septic tank will provide primary treatment by settling solids and reducing organic matter, while the soak pit will facilitate the infiltration of treated effluent into the surrounding soil. This system is suitable for handling

domestic sewage generated by the facility and will ensure environmentally sound wastewater management.

**Water Balance Diagram of the Project**



*Figure 3.4: Water Balance Diagram of the Project*

### **3.9 Environmental Management Infrastructure**

#### ***3.9.1 Wastewater Generation and Management of the Project***

As discussed in Section 3.8.3, the proposed project will generate both industrial and domestic wastewater during its operation. Industrial wastewater generated from production processes and associated cleaning activities will be collected and treated through the proposed Effluent Treatment Plant (ETP) prior to reuse or disposal in accordance with applicable environmental regulations. Domestic wastewater generated from sanitary and other non-industrial activities will be managed through a septic tank and soak pit system. The proposed wastewater management facilities have been designed to ensure effective treatment and environmentally sound disposal of all wastewater generated from the project. **Detail ETP design and drawing is attached in the Annexure - IV**

#### ***3.9.2 Air Pollution Sources and Management Infrastructure***

##### **Air Pollution Sources**

The lead-acid battery manufacturing process involves several production sections that may generate air pollutants during operation.

**Grid Casting Section:** Lead ingots are melted in furnaces and cast into battery grids. During the lead melting and casting process, lead fumes and smoke may be generated and released into the workplace environment if not properly controlled.

**Battery Assembly Section:** During battery assembly, lead components are joined using lead welding processes. This operation may generate lead fumes. In addition, handling and assembly of battery plates may result in the release of small quantities of lead dust due to abrasion and material loss.

**Lead Powder Filling Section:** Lead dust may be generated during the filling of lead powder into battery tubulars and other lead-handling operations. Without adequate dust collection systems, these fine particles may become airborne.

**Plate Formation and Charging Section:** During battery formation and charging, sulfuric acid-containing electrolyte is used. The electrochemical charging process may generate acid mist or acid fog, which can be released into the surrounding air.

Therefore, the primary air pollutants associated with the proposed lead-acid battery manufacturing facility are lead fumes (lead smoke), lead dust, and acid mist (acid fog). Appropriate air pollution control measures will be incorporated into the facility design to minimize emissions and ensure compliance with applicable environmental standards.

### **Air Treatment Plant (ATP)**

The air pollutants generated from the manufacturing processes of Kishan Accumulators Ltd. will be controlled through a dedicated Air Treatment Plant (ATP) designed to capture and treat lead fumes, lead dust, and acid mist before their release into the atmosphere. The ATP will incorporate a combination of wet scrubbing and dry scrubbing technologies to ensure compliance with applicable environmental standards and occupational health requirements.

**Wet Scrubber System:** Wet scrubbers will be installed to control acid mist and lead fumes generated from the grid casting and plate formation/charging sections. In this system, contaminated air passes through a scrubbing chamber where it comes into contact with a liquid medium, effectively removing particulate matter, lead-containing fumes, and acidic contaminants from the exhaust stream before discharge.

**Dry Scrubber System:** Dry scrubbers will be used to control lead dust generated from the battery assembly and lead powder handling sections. These systems operate by passing contaminated air through filtration and dry reagent-based treatment units that capture fine lead particles and other airborne contaminants. The collected dust will be safely handled and managed as hazardous waste in accordance with environmental regulations.

To effectively manage air emissions from different production areas, two (2) wet scrubbers will be installed for the plate formation and charging section, one (1) wet scrubber will be installed for the grid casting section, and two (2) dry scrubbers will be installed for the battery assembly and lead powder filling sections. The proposed ATP system will significantly reduce emissions of lead fumes, lead dust, and acid mist, thereby protecting worker health and minimizing impacts on the surrounding environment. **Detail Drawing of APCS is attached in Annexure - V**

### **3.10 Resource Recovery Infrastructure (RO Plant)**

The project authority has planned to implement a wastewater recycling system to promote sustainable water resource management and reduce freshwater consumption. Following the issuance of the Environmental Clearance Certificate (ECC) and successful operation of the proposed Effluent Treatment Plant (ETP), an RO (Reverse Osmosis) plant will be installed to facilitate the recovery and reuse of treated industrial wastewater. The recycled water will be utilized for suitable industrial purposes within the facility, thereby minimizing wastewater discharge and enhancing overall water-use efficiency. This initiative reflects the project's commitment to environmentally responsible and resource-efficient operations.

## **CHAPTER 04**

### **ANALYSIS OF ALTERNATIVES**

## **4. STUDY OF ALTERNATIVE OPTIONS**

### **4.1 Introduction**

The Analysis of Alternatives is a key component of this Environmental Impact Assessment (EIA), carried out to systematically evaluate different options for establishing the proposed Lead Acid Starter Battery (LAS) Manufacturing Unit. This assessment ensures that the selected project configuration—including site selection, production technology, layout design, and operational approach—represents the most environmentally sound, economically feasible, and socially acceptable option for achieving the intended objective of strengthening domestic battery production capacity.

In accordance with the Environmental Conservation Rules (ECR), 2023, this chapter provides a transparent and structured justification of the decision-making process. It demonstrates that the proposed project design has been selected after careful consideration of alternative options, taking into account their potential environmental impacts, technical feasibility, and socio-economic implications. This ensures that the final project approach minimizes adverse environmental effects while maximizing economic benefits and resource efficiency.

The analysis is structured to evaluate four primary dimensions of choice:

1. The fundamental necessity of the project itself (the "No Project" alternative).
2. The suitability of alternative geographical locations for siting the facility.
3. The environmental implications of different production technologies.
4. The overarching merits and justifications for the proposed project option as the preferred alternative.

### **4.2 Evaluation of the "No Project" Alternative**

The “No Project” alternative serves as an important baseline scenario against which the potential impacts of the proposed Lead Acid Starter Battery (LAS) manufacturing project are evaluated. Under this scenario, the proposed project would not be implemented, and the existing land at Uzirpur, Bokultola, Narail Sadar, Narail would remain under its current vacant condition without any industrial development or battery manufacturing activities.

In this case, all potential environmental impacts associated with project construction and operation would be fully avoided. These include possible emissions to air, generation of

industrial effluents, noise pollution, solid and hazardous waste production, and increased vehicular movement during both construction and operational phases. From a purely local environmental perspective, this option appears favorable due to the absence of new industrial stress on the surrounding environment.

However, a broader analysis indicates that the “No Project” alternative would result in significant socio-economic and developmental opportunity losses. The growing national demand for lead acid starter batteries—driven by the automotive sector, transport services, and backup power requirements—would continue to rely heavily on imported products. This would contribute to foreign currency outflow, increased import dependency, and reduced industrial self-sufficiency in the battery sector.

Furthermore, the proposed project is expected to generate employment opportunities, enhance technical skill development, and stimulate local economic activities through supporting services such as transportation, maintenance, and raw material supply chains. Therefore, while the “No Project” alternative avoids immediate environmental impacts, it is considered less desirable as it fails to contribute to national industrial growth, economic diversification, and sustainable development objectives.

### **4.3 Assessment of Alternative Locations**

The selection of an appropriate project site is a critical determinant of a project’s environmental impacts, operational efficiency, and social acceptability. In the case of the proposed Lead Acid Starter Battery (LAS) Manufacturing Unit, several alternative locations were carefully assessed before finalizing the proposed site at Uzirpur, Bokultola, Narail Sadar, Narail.

One major alternative considered was the development of the project in a Greenfield site within an established government-designated industrial zone. Although such zones are generally designed to accommodate industrial activities with planned infrastructure, this option was not selected due to several environmental and socio-economic limitations. It would require acquisition of new land, which could potentially lead to land-use conversion and increased pressure on agricultural or surrounding natural areas. In addition, a Greenfield development would demand full-scale infrastructure development, including access roads, electricity supply, water sourcing, and waste management systems, thereby significantly increasing both capital cost and environmental burden associated with construction activities. The need for separate

permitting processes and utility connections would also introduce additional time delays and administrative complexities.

Another alternative considered was locating the facility in proximity to major urban centers or transport hubs to reduce logistics costs and improve supply chain efficiency. However, this option was not preferred due to higher environmental sensitivity and population density in such areas. Establishing a battery manufacturing facility near densely populated urban zones would increase potential exposure risks associated with industrial emissions, hazardous materials, and operational accidents. Moreover, land availability constraints and significantly higher land acquisition costs further reduced the feasibility of this option.

In contrast, the selected site in Narail offers a more balanced approach by utilizing available land with minimal social displacement, while supporting the broader national objective of industrial decentralization and regional economic development. The chosen location is therefore considered the most suitable in terms of environmental compatibility, economic feasibility, and long-term sustainability of the project.

#### **4.4 Detailed Justification for the Proposed Project Option**

The proposed option—to co-locate the new Lead Acid Starter Battery (LAS) Manufacturing Unit within the project site at Uzirpur, Bokultola, Narail Sadar, Narail—is strongly justified as the most sustainable and rational choice based on environmental, technical, and socio-economic considerations.

Foremost, the project promotes efficient land utilization by developing the facility on already identified and available industrial land (111 decimal), thereby avoiding the need for additional land acquisition. This approach helps prevent potential impacts such as conversion of agricultural land, displacement of communities, and associated social conflicts. It also ensures that the project is established within an already suitable industrial setting, minimizing land-use change impacts.

A key advantage of the selected site is its infrastructural readiness and development efficiency. The availability of access roads, proximity to utility connections, and ease of establishing necessary support facilities significantly reduce the need for extensive new

infrastructure development. This not only lowers construction costs but also minimizes the overall environmental footprint associated with new utility installation and land disturbance.

Another important benefit of the proposed location is the opportunity for improved operational efficiency and industrial clustering. The site selection allows for streamlined logistics in the procurement of raw materials such as lead, lead oxide, sulfuric acid, and battery components, as well as distribution of finished products. This contributes to reduced transportation requirements and associated emissions.

From an environmental management perspective, the proposed project will benefit from the implementation of a structured Environmental Management System (EMS) during its operation, ensuring compliance with national standards and regulatory requirements. The planned adoption of modern battery manufacturing technologies will further help in minimizing emissions, waste generation, and occupational health risks.

Finally, the selected site is socially appropriate as it supports local employment generation and skill development in an area already suitable for industrial activity. The project is expected to create direct and indirect job opportunities, thereby contributing to local economic development while maintaining harmony with surrounding land use patterns.

#### **4.5 Conclusion**

In conclusion, the rigorous and systematic analysis presented in this chapter demonstrates that the proposed project option—entailing the establishment of a Lead Acid Starter Battery (LAS) manufacturing unit within the identified industrial site at Uzirpur, Bokultola, Narail Sadar, Narail—represents the most environmentally sound, economically viable, and socially beneficial alternative.

The selected option ensures optimal utilization of available industrial land (111 decimal), thereby avoiding unnecessary land acquisition and associated environmental and social impacts such as loss of agricultural land or community displacement. It also takes advantage of the site's suitability for industrial development, reducing the need for extensive new infrastructure and thereby minimizing construction-related environmental disturbances and costs.

Furthermore, the project is designed to incorporate modern battery manufacturing technology, enabling efficient production while minimizing emissions, waste generation, and occupational

health risks. The proposed capacity of 1,300 units per month, supported by systematic raw material utilization, strengthens the project's contribution to import substitution and national industrial growth.

From a socio-economic perspective, the project is expected to generate meaningful direct and indirect employment opportunities, enhance local technical skills, and stimulate supporting industries and services in the region. It also aligns with national objectives of sustainable industrialization and economic diversification.

Therefore, this option is considered the most balanced and sustainable alternative, offering maximum overall benefits while minimizing potential environmental impacts. It is accordingly recommended as the preferred option for implementation.

**CHAPTER 05**

**BASELINE ENVIRONMENT STUDY**

## **5. BASELINE ENVIRONMENT STUDY**

### **5.1 General Consideration**

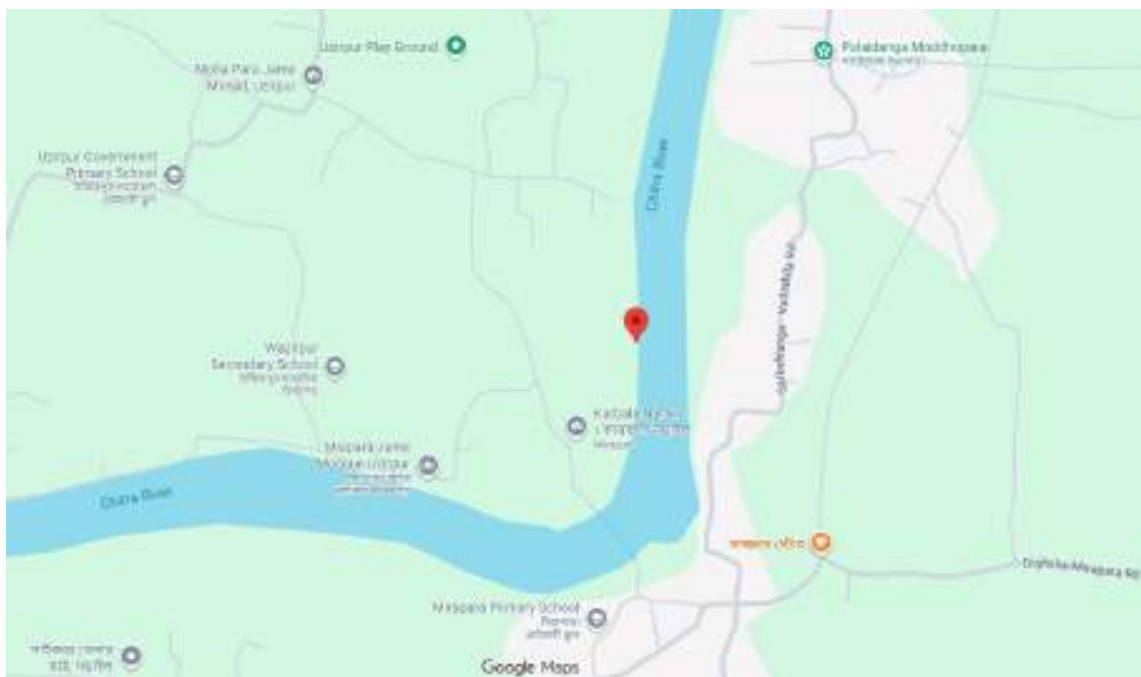
Baseline condition of environment states the present status of different components of environment. The main objective of examining the present environment is to provide an environmental baseline against which potential impacts from the operation and any future construction needed for the industry. A second important function of establishing a baseline for parameters such as air and water quality is to ensure that any problems arising from existing sources are not erroneously attributed to the industry under study. In the present study the different environmental components examined for setting baseline conditions of the industry area, are physicochemical, biological and socio economical. In physico-chemical component, parameters included are land, water quality, air quality, climate, and noise.

### **5.2 Study Area**

**Kishan Accumulators Ltd.** is a proposed industrial project planned to be established at Uzirpur, Bokultola, Narail Sadar, Narail, Bangladesh. The project site is located in a suitable industrial setting with good accessibility to local road networks, facilitating smooth transportation of raw materials and finished products. The geographic coordinates of the project location are 23.127414° N latitude and 89.520820° E longitude, placing it within a developing industrial and semi-urban landscape.

The total land area of the proposed project is approximately 111 decimals, which has been allocated exclusively for the establishment of the Lead Acid Starter Battery (LAS) manufacturing unit. The site is currently vacant (no existing industrial or agricultural use), which makes it environmentally and socially suitable for new industrial development without requiring displacement or land-use conversion from sensitive categories.

The proposed layout will accommodate production facilities, raw material storage, finished goods warehouse, administrative buildings, and internal circulation spaces. Adequate provisions will also be made for safety zones, utility installations, and environmental protection facilities such as effluent treatment and waste handling areas, in accordance with regulatory requirements.



*Figure 5.1: Location Map of the Project*

The selection of this site reflects careful consideration of environmental compatibility, land availability, and infrastructure accessibility. The location is considered appropriate for industrial use and supports the establishment of a modern battery manufacturing facility while ensuring compliance with environmental regulations and sustainable development principles.

### 5.3 Physical Environment

### 5.3.1 Project Site

The proposed site of Kishan Accumulators Ltd. is located at Uzirpur, Bokultola, Narail Sadar, Narail, Bangladesh, at geographic coordinates 23.127414° N and 89.520820° E. The site is approximately 111 decimals in area and is currently vacant, making it suitable for the establishment of a new industrial facility without requiring relocation of existing settlements or conversion of productive agricultural land.

The location is accessible through nearby local road networks, ensuring efficient connectivity for the transportation of raw materials such as lead, lead oxide, sulfuric acid, and other battery components, as well as distribution of finished products. The site is situated in a developing industrial environment, which supports compatible land use for battery manufacturing

activities. The site also meets regulatory requirements for Site and Environmental Clearance, making it an appropriate choice for industrial expansion.

### **5.3.2 Landform and Soil Classification**

The current project area has been marked in in the Physiography map, General Soil Map of Bangladesh in Figure 5.2 and Figure 5.3. Most of the area of Bangladesh is a vast, low- lying alluvial plain, sloping gently to the south and southeast.

#### **Landform:**

Narail District, located in southwestern Bangladesh, is part of the lower Ganges deltaic floodplain system. The region is characterized by low-lying, flat topography with very gentle slopes and localized depressions. The landscape is influenced by an extensive network of rivers, canals, and wetlands, including the Chitra, Nabaganga, and Madhumati river systems, which play a significant role in shaping local drainage conditions, seasonal flooding patterns, and alluvial sediment deposition. The district predominantly consists of fertile alluvial floodplains with scattered natural levees and slightly elevated land patches along river corridors.

#### **Soil Classification:**

The soils of Narail District are mainly of recent and young alluvial origin, formed through continuous sediment deposition from riverine systems of the Ganges delta. The major soil types include:

- ✓ Floodplain soils: These are primarily silty clay to clayey in texture, highly fertile but prone to seasonal waterlogging and poor natural drainage conditions, particularly during the monsoon period.
- ✓ Meander belt soils: Consisting mainly of sandy loam to loam textures, these soils are relatively better drained and moderately fertile, typically found along active or abandoned river channels and raised natural levees.
- ✓ Recent alluvial deposits: Soft, fine-grained sediments dominated by silt and clay fractions, commonly found in low-lying areas and wetlands, suitable for agriculture when supported by proper drainage and flood management measures.

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

Overall, the soils of Narail District are highly fertile but exhibit considerable variation in drainage characteristics depending on local geomorphology. The flat terrain and alluvial soil composition make the region generally suitable for industrial development, provided that appropriate site preparation, foundation engineering, and drainage management measures are implemented to ensure long-term structural stability and environmental compatibility for the proposed Lead Acid Starter Battery (LAS) manufacturing project.

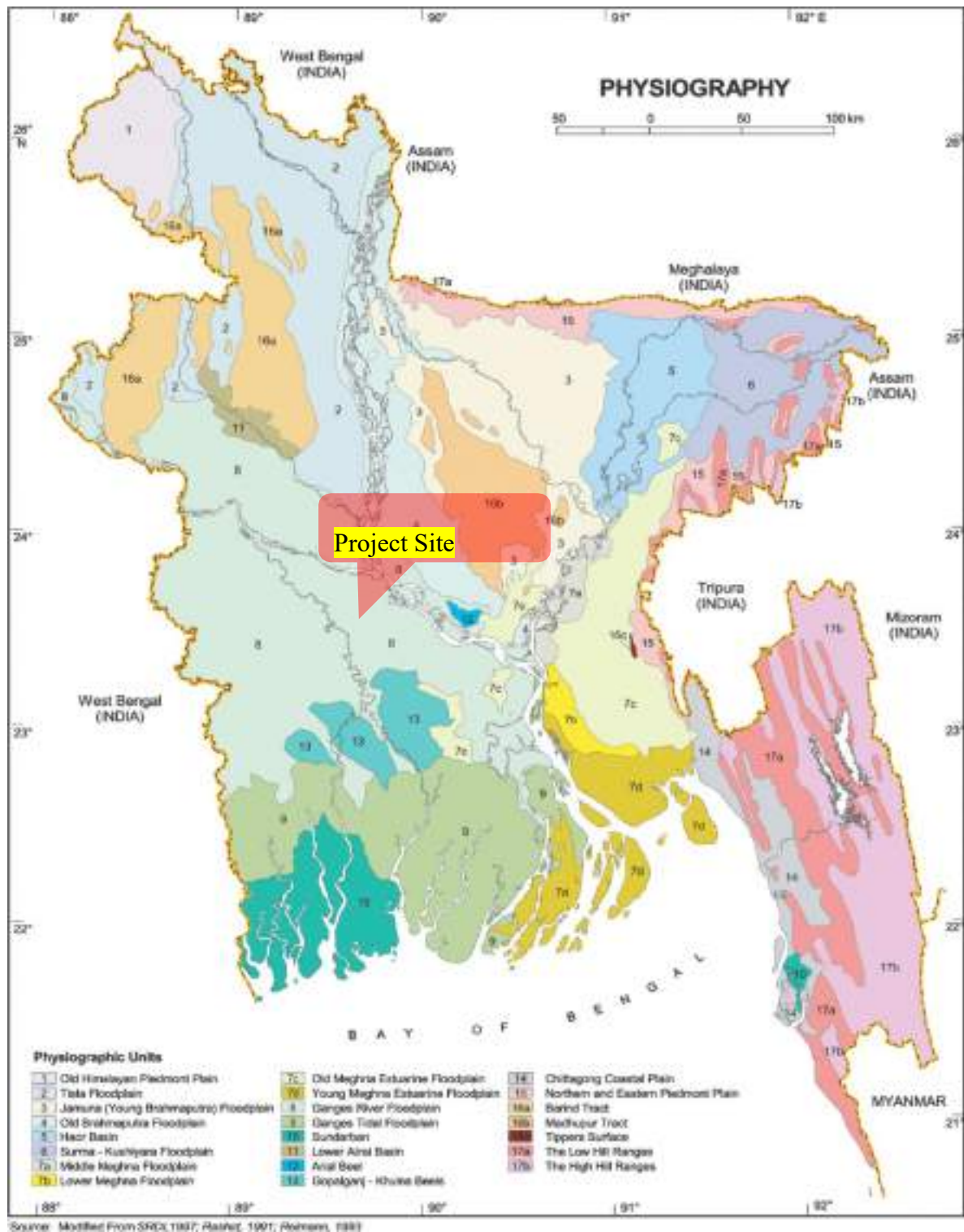


Figure 5.2: Physiography of Bangladesh

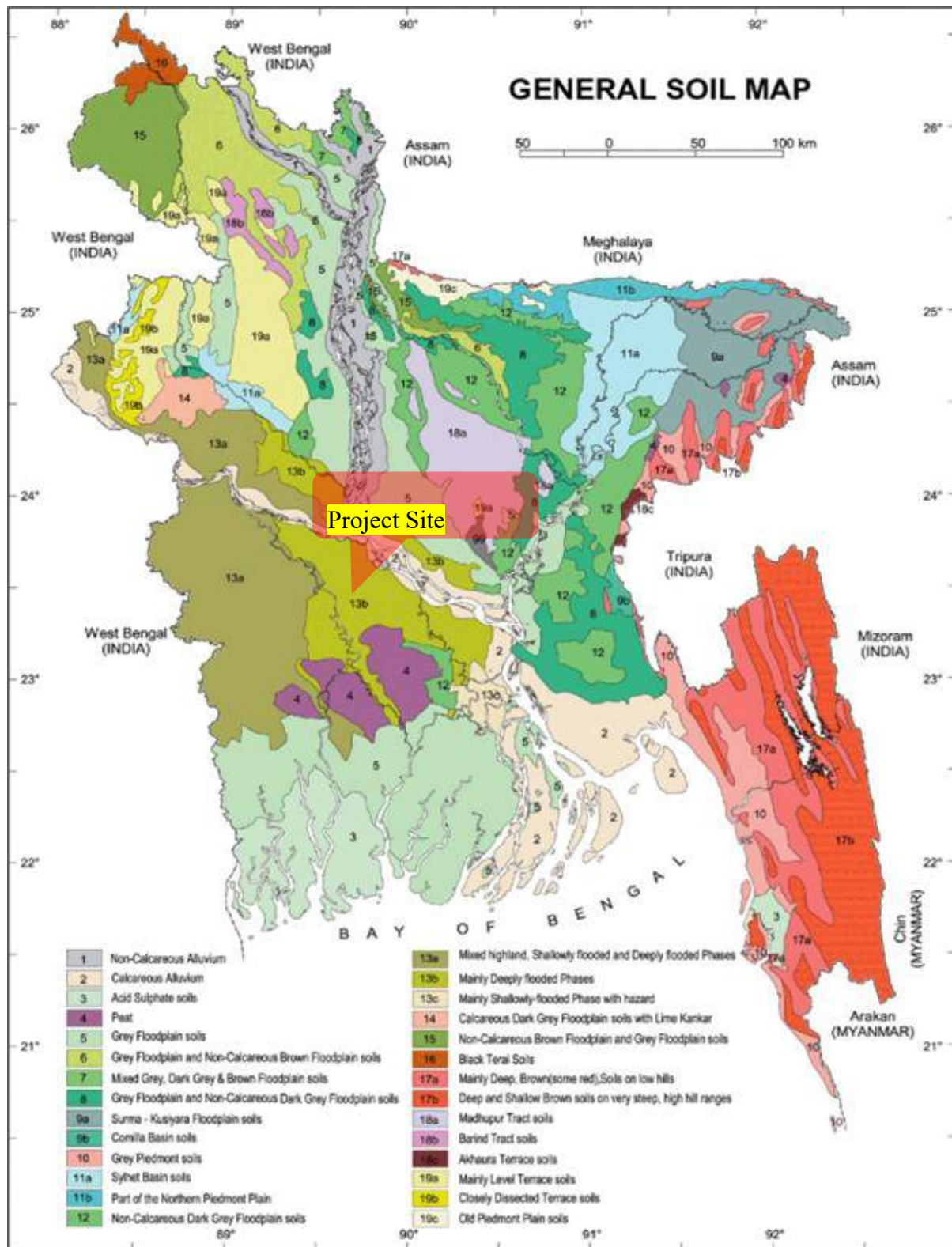


Figure 5.3: General Soil Map of Bangladesh

## **5.4 Climatic Condition**

The climate of Narail District, where the proposed Lead Acid Starter Battery (LAS) manufacturing project is located, is characterized as a tropical monsoon climate with distinct seasonal variations in temperature, rainfall, and humidity. The district experiences three primary seasons: hot pre-monsoon summer, wet monsoon, and mild dry winter, consistent with the broader climatic pattern of the Ganges delta region of Bangladesh.

- Summer / Pre-monsoon (March to May):

This period is generally hot and humid, with average temperatures ranging from 25°C to 36°C. Intermittent thunderstorms and localized rainfall events are common due to convective activity.

- Monsoon (June to October):

The monsoon season contributes the majority of annual rainfall, averaging approximately 1,800–2,200 mm in the southwestern region of Bangladesh. High humidity and frequent heavy rainfall events are typical, often leading to temporary waterlogging in low-lying areas (BMD, 2020; MoEFCC, 2023).

- Winter (November to February):

Winter is mild and relatively dry, with temperatures ranging between 12°C and 25°C, providing stable environmental conditions suitable for construction and industrial operations.

The region is influenced by southwesterly monsoon winds during the wet season and northeasterly winds during the dry season. Occasionally, residual effects of cyclonic storms originating from the Bay of Bengal affect rainfall patterns, wind speed, and localized flooding in parts of southwestern Bangladesh (BMD, 2020).

Overall, the climate of Narail District is favorable for industrial development; however, considerations such as high rainfall intensity, drainage capacity, humidity control, and flood risk management are essential for the sustainable operation of the proposed LAS battery manufacturing project.

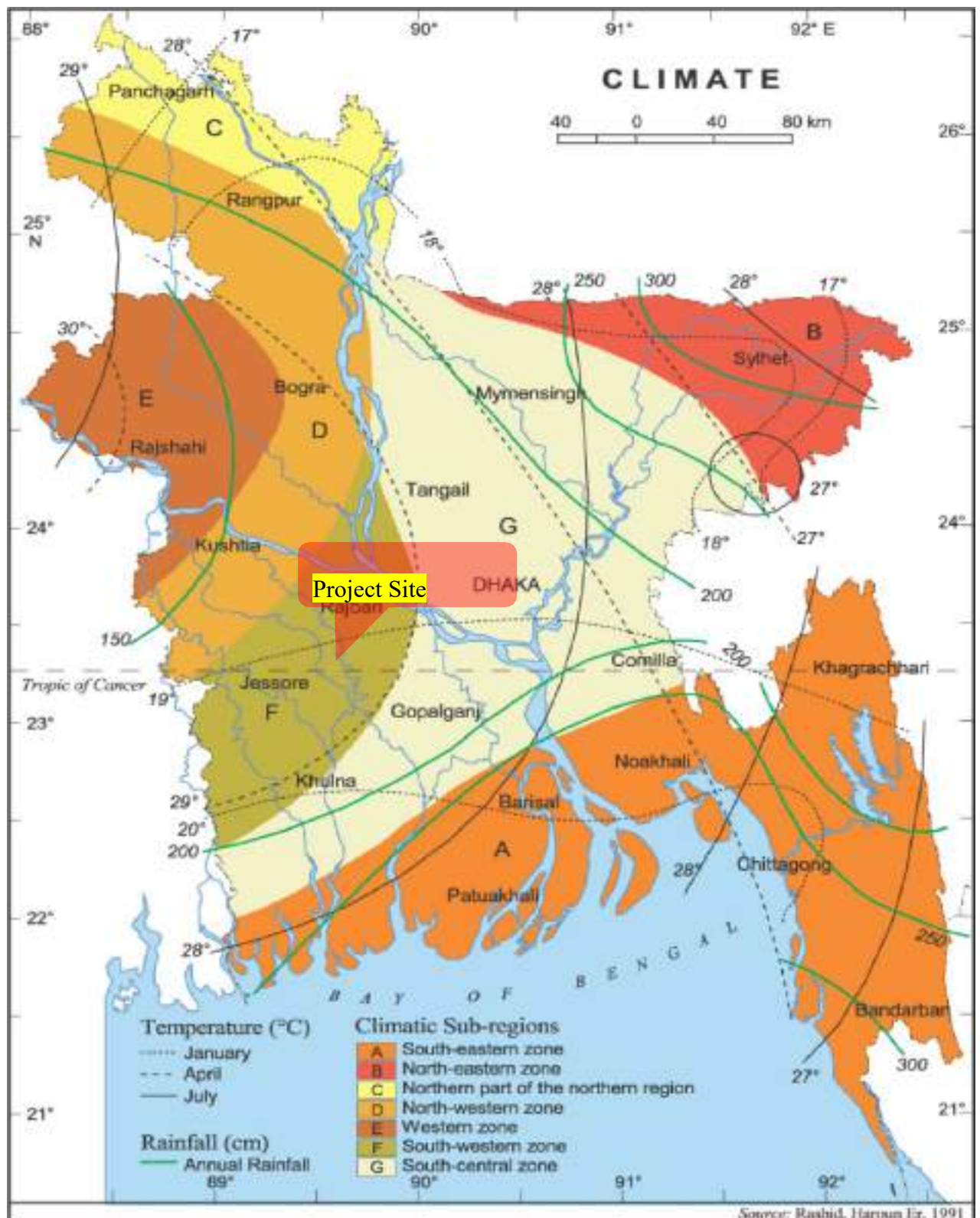


Figure 5.4: Climate Map of Bangladesh

#### **5.4.1 Rainfall**

Narail District, located in the south-western part of Bangladesh, also experiences a tropical monsoon climate with distinct wet and dry seasons. The district receives an average annual rainfall of approximately **1,800–2,200 mm**, with some year-to-year variation depending on monsoon intensity. Most of the rainfall occurs during the monsoon period from **June to September**, with **July and August** being the peak rainfall months.

This rainfall pattern strongly influences local agriculture, surface water availability, and drainage conditions. However, during heavy monsoon rainfall events, parts of Narail may experience temporary waterlogging due to low-lying terrain and inadequate drainage capacity in some areas.

For the industrial development of Kishan Accumulators Ltd., proper stormwater drainage design, site elevation planning, and flood management measures are essential to ensure climate-resilient infrastructure and uninterrupted operation during the rainy season.

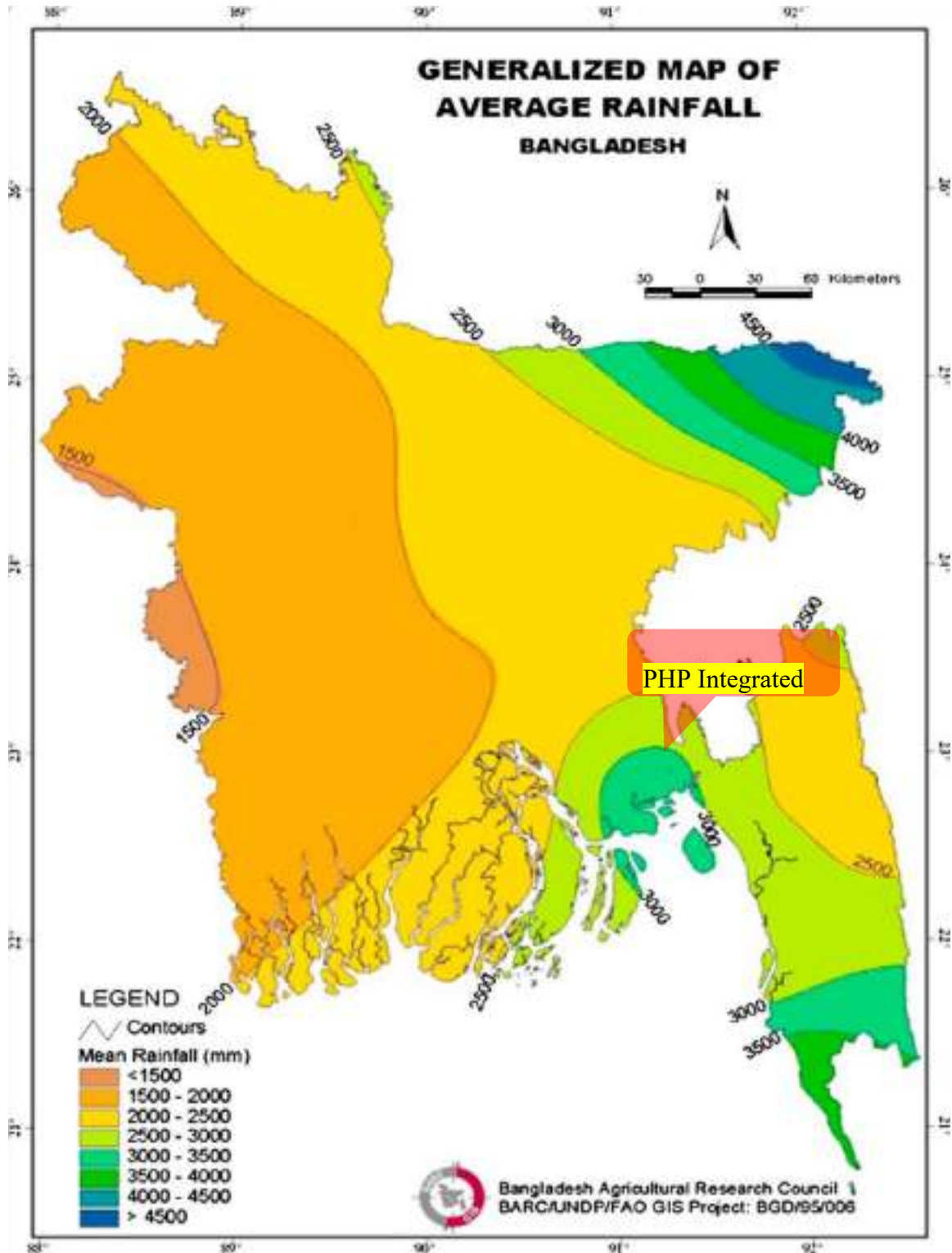
*Table 5.1: Monthly Average Rainfall in the project area*

| Month    | Avg. Rainfall (mm) |
|----------|--------------------|
| January  | 3                  |
| February | 20                 |
| March    | 42                 |
| April    | 112                |
| May      | 236                |
| June     | 327                |
| July     | 451                |
| August   | 391                |

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|                       |             |
|-----------------------|-------------|
| September             | 270         |
| October               | 181         |
| November              | 22          |
| December              | 4           |
| <b>Total Rainfall</b> | <b>2059</b> |

*Source: BMD dataset (1991-2020)*

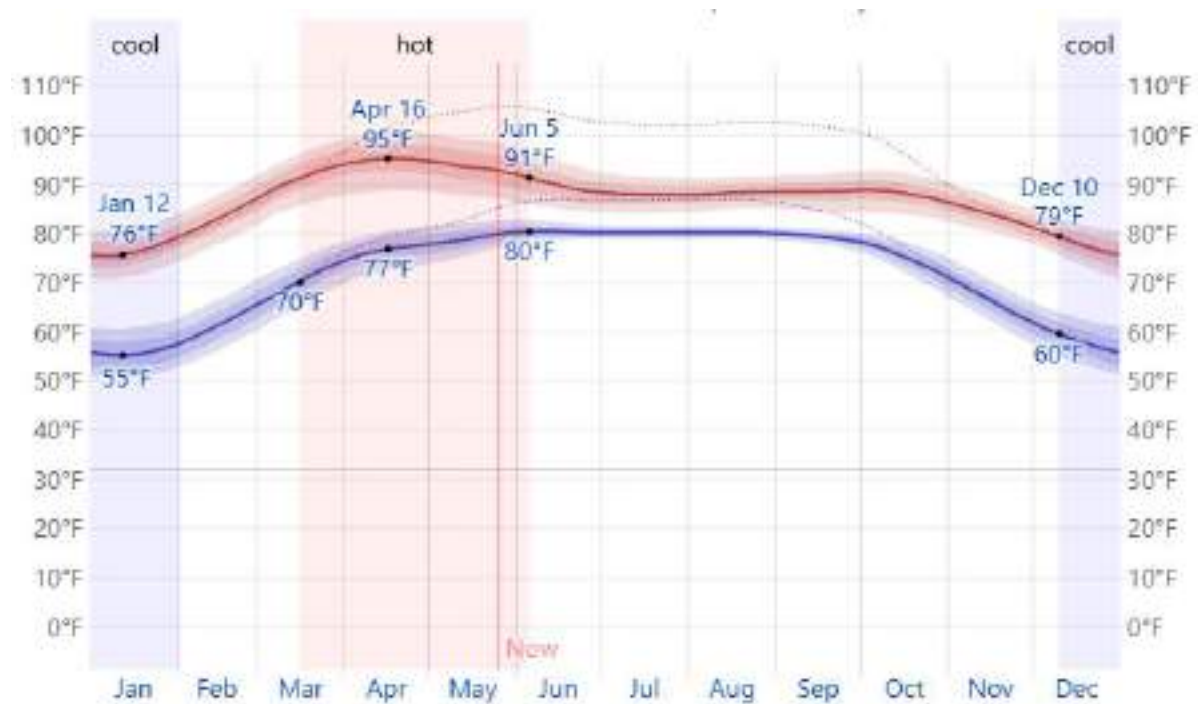


*Figure 5.5: Average rainfall map of Bangladesh*

### **5.4.2 Average Temperature**

The hot season lasts for 2.7 months, from March 16 to June 5, with an average daily high temperature above 91°F. The hottest month of the year in Narail is May, with an average high of 93°F and low of 79°F.

The cool season lasts for 1.7 months, from December 10 to February 1, with an average daily high temperature below 79°F. The coldest month of the year in Narail is January, with an average low of 56°F and high of 77°F.

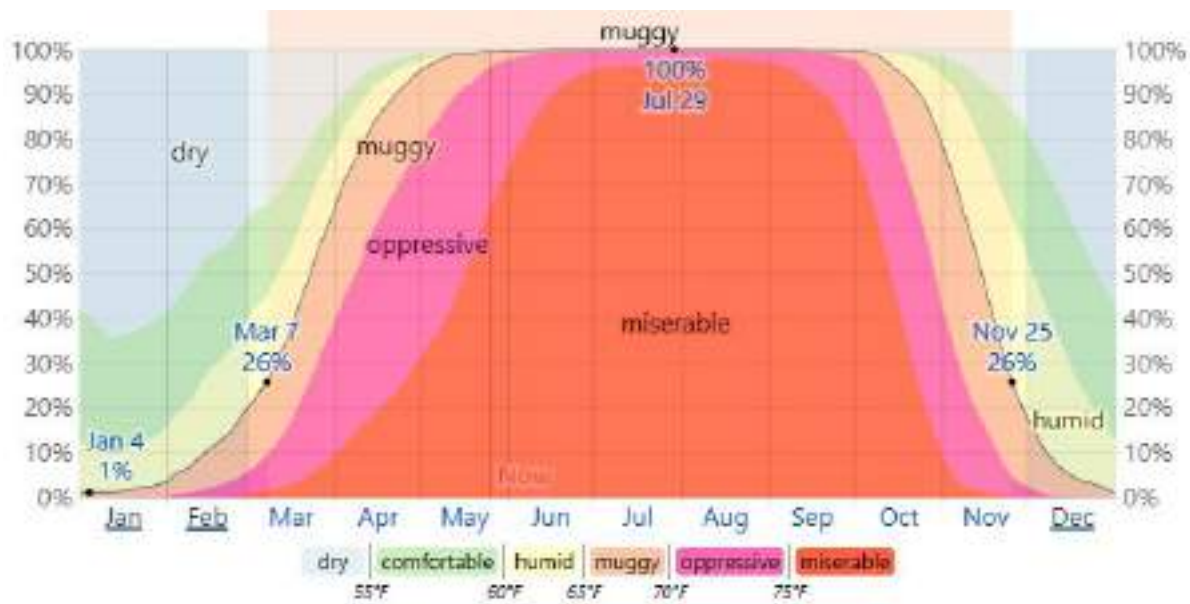


*Figure 5.6: Average Temperature of the Project Area*

### **5.4.3 Humidity**

We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

Narail experiences extreme seasonal variation in the perceived humidity. The muggier period of the year lasts for 8.6 months, from March 7 to November 25, during which time the comfort level is muggy, oppressive, or miserable at least 26% of the time. The month with the fewest muggy days in Narail is January, with 0.5 days that are muggy or worse. The month with the fewest muggy days in Narail is January, with 0.5 days that are muggy or worse.



*Figure 5.7: Humidity Scenario of the Project Area*

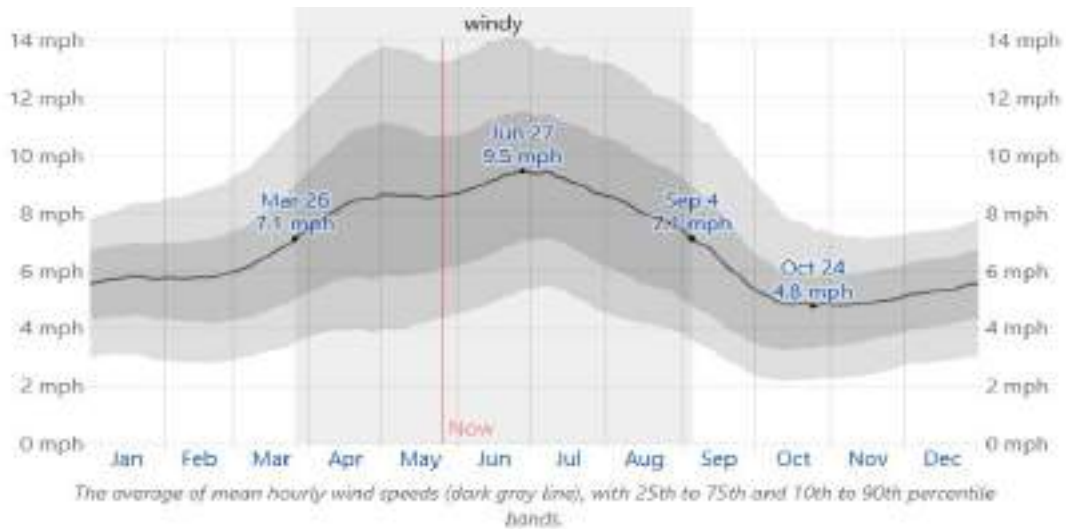
#### **5.4.4 Wind Speed and Direction**

This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages. The average hourly wind speed in Narail experiences significant seasonal variation over the course of the year.

The windier part of the year lasts for 5.3 months, from March 26 to September 4, with average wind speeds of more than 7.1 miles per hour. The windiest month of the year in Narail is June, with an average hourly wind speed of 9.2 miles per hour.

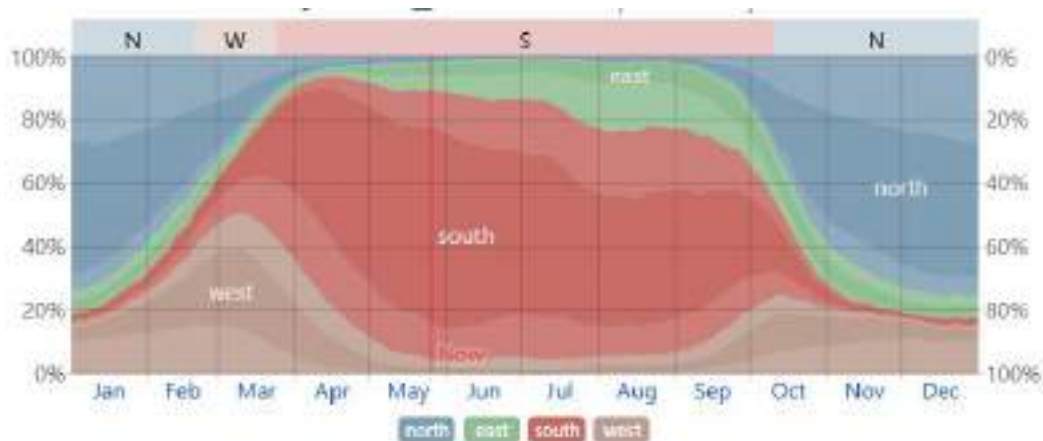
*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

The calmer time of year lasts for 6.7 months, from September 4 to March 26. The calmest month of the year in Narail is October, with an average hourly wind speed of 4.9 miles per hour.



*Figure 5.8: Wind Speed in the Project Area*

The wind is most often from the west for 1.2 months, from February 19 to March 24, with a peak percentage of 51% on March 11. The wind is most often from the south for 6.5 months, from March 24 to October 10, with a peak percentage of 85% on May 28. The wind is most often from the north for 4.3 months, from October 10 to February 19, with a peak percentage of 74% on January 1.



*Figure 5.9: Wind Direction of the Project Area*

## 5.5 Hydrology

### 5.5.1 Surface Water Quality

Like other parts of Bangladesh, the project area in Narail District also receives a substantial amount of rainfall. Narail is characterized by the presence of rivers, canals, and low-lying water bodies that support local agriculture and fisheries.

To establish baseline conditions, the quality of surface water was analyzed. In accordance with the Terms of Reference (ToR) and the Environment Conservation Rules (ECR), 2023, surface water samples were collected from the Chitra River and other selected locations and analyzed in the laboratory. Samples were collected from the upstream (about 100m), downstream (about 100m), and discharge drain points. A total of eight (7) surface water samples were collected and analyzed. The detailed results of this monitoring are provided in Annexure-II.

*Table 5.2: Surface Water Test Summary*

| Sl. No. | Parameters | Unit | Concentrations in Present |            |                   | DoE (Bangladesh) Standard for Inland Surface Water. |
|---------|------------|------|---------------------------|------------|-------------------|-----------------------------------------------------|
|         |            |      | Upstream                  | Downstream | Nearby Pond Water |                                                     |
| 01      | pH         | -    | 7.8                       | 7.9        | 8.6               | 6.0 – 9.0                                           |
| 02      | TDS        | mg/L | 437                       | 437        | 562               | 1000                                                |
| 03      | SS         | mg/L | 11                        | 11         | 27                | 25                                                  |
| 04      | DO         | mg/L | 4.9                       | 4.9        | 5.6               | ≥5                                                  |
| 05      | BOD        | mg/L | 3.1                       | 3.1        | 4.7               | ≤6                                                  |
| 06      | Pb         | mg/L | 0.005                     | 0.005      | 0.03              | 0.1                                                 |
| 07      | COD        | mg/L | 24                        | 24         | 35                | 50                                                  |

**Comment:** Appropriate analytical methods have been used for the determination of the above-mentioned parameters of surface water. The physico-chemical parameters of the water were below the standard level of surface water quality set by the DoE, Govt. of Bangladesh.

*Sources: Monitoring Report (Annexure-II)*

### **5.5.2 Ground Water Quality**

As in other parts of the country, the project area of Kishan Accumulators Ltd. also receives a sufficient amount of rainfall, supporting natural groundwater recharge. Groundwater is widely available in the region and is commonly used through deep tube wells for drinking and domestic purposes.

The project will utilize groundwater through deep tube wells while adopting water conservation measures to reduce overall consumption. Proper sanitation facilities, including septic tank systems, will be installed to manage domestic wastewater. The surrounding environmental conditions are generally favorable for groundwater recharge; therefore, significant long-term decline in the local groundwater table is not anticipated, and there are no reported complaints regarding groundwater scarcity in the area.

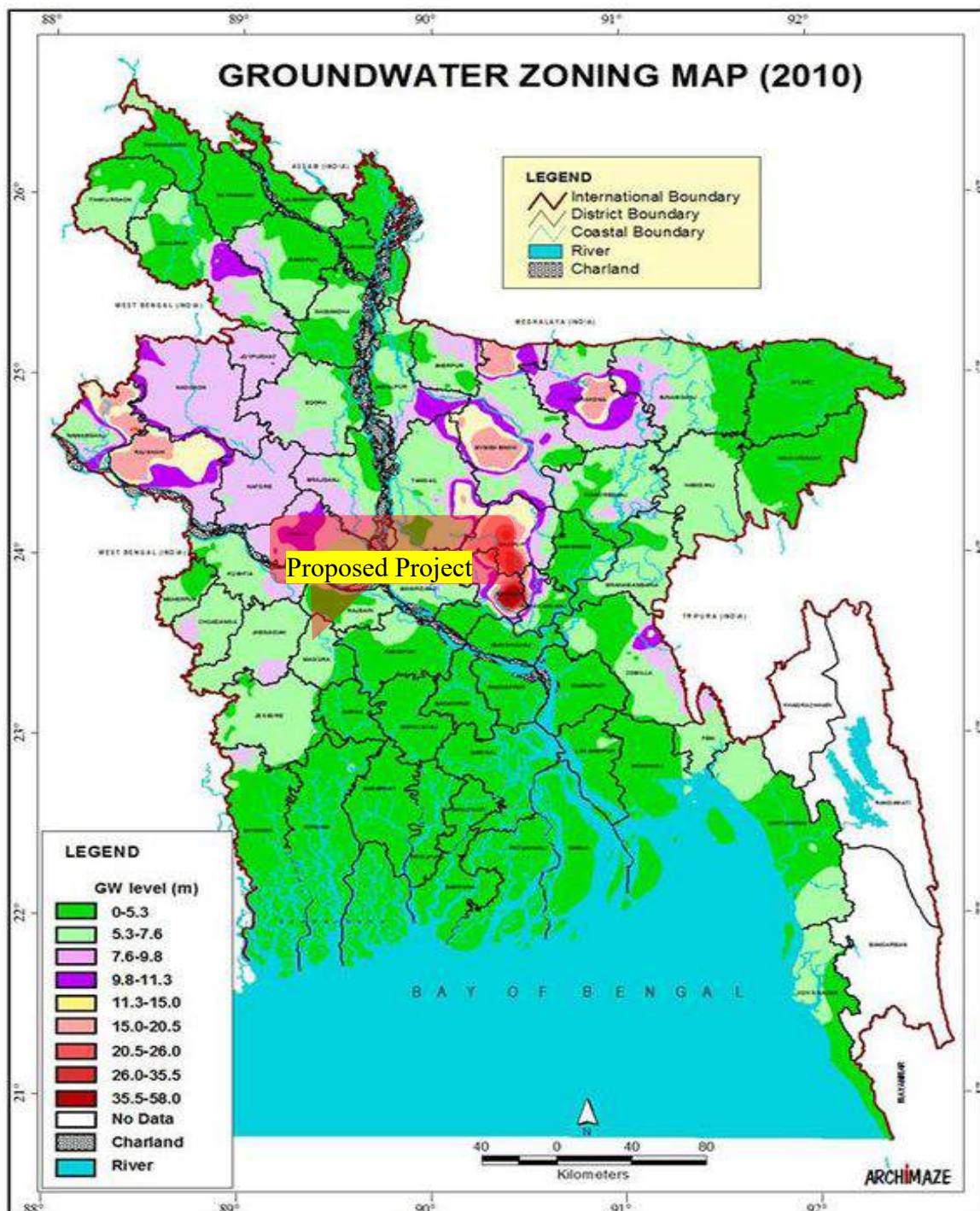
To assess groundwater quality, samples will be collected from on-site groundwater sources and analyzed in a certified laboratory to ensure suitability for industrial and domestic use, as well as to establish baseline water quality conditions for future monitoring and environmental management. The ground water quality analysis report has been tabulated in Table.

*Table 5.3: Ground Water quality (limited parameters) of the Project*

| Sl. No. | Parameters | Unit | Concentrations Present          |                            |                                           | Bangladesh Standard |
|---------|------------|------|---------------------------------|----------------------------|-------------------------------------------|---------------------|
|         |            |      | GW-01<br>Project Deep Tube-Well | GW-02<br>Project Tube-Well | GW-03<br>Project Outside Area (Tube-Well) |                     |
| 01      | pH         | -    | 7.4                             | 7.5                        | 7.3                                       | 6.5-8.5             |
| 02      | TDS        | mg/L | 231                             | 235                        | 230                                       | 1000                |
| 03      | Iron       | mg/L | 0.42                            | 0.42                       | 0.43                                      | 0.3-1.0             |
| 04      | Alkalinity | mg/L | 149                             | 150                        | 148                                       | --                  |
| 05      | Hardness   | mg/l | 38                              | 39                         | 37                                        | (200-500) mg/l      |
| 06      | Chloride   | mg/L | 29                              | 29                         | 29                                        | 250                 |
| 07      | Lead       | mg/L | 0.002                           | 0.002                      | 0.001                                     | 0.01                |
| 08      | Arsenic    | mg/L | 0.004                           | 0.004                      | 0.004                                     | 0.05                |

**Comment:** Comments: The laboratory analyses have been used for the determination of above-mentioned Parameters (pH, TDS, Iron, Alkalinity, Hardness, Chloride, Lead, Arsenic) and buffered calibrated pH meter has been used for determining its value. The ground water quality of the supplied water from Kishan Accumulators Ltd. was good and the values of parameters were within the limit of water quality standard (DOE/EPA). This water might be used as drinking purposes.

*Sources: Monitoring Report (Annexure-II)*



*Figure 5.10: Groundwater Zoning Map of Bangladesh*

## 5.6 Noise Level

The ambient noise environment consists of the total noise generated in the area at various distance around the sampling locations. The noise level varies depending on the type of activities carried out in the surrounding area. The baseline noise environment was studied at the project site and existing project premises. The locations considered for the noise monitoring are tabulated below along with the DoE limits following ToR. Total 4 locations covered during noise monitoring study. Detail report attached with Annexure-II.

Table 5.4: Noise level around the project site.

| Sample ID                               | Location Name and GPS Coordinates                        | Concentration Present (dB) |                  |                  |            |                  |                  | Category    |            |
|-----------------------------------------|----------------------------------------------------------|----------------------------|------------------|------------------|------------|------------------|------------------|-------------|------------|
|                                         |                                                          | Day Time                   |                  |                  | Night Time |                  |                  |             |            |
|                                         |                                                          | Leq                        | L <sub>max</sub> | L <sub>min</sub> | Leq        | L <sub>max</sub> | L <sub>min</sub> |             |            |
| NL - 01                                 | East side of the Project<br>N: 23.125780 & E: 89.520388  | 45.77                      | 51.5             | 39.5             | 34.58      | 41.7             | 31.9             | Silent Area |            |
| NL - 02                                 | West side of the Project<br>N: 23.127640 & E: 89.520703  |                            | 56.5             | 35.4             |            | 45.7             | 30.2             | Silent Area |            |
| NL - 03                                 | North side of the Project<br>N: 23.127375 & E: 89.520630 |                            | 51.7             | 38.6             |            | 37.2             | 31.3             | Silent Area |            |
| NL - 04                                 | South side of the Project<br>N: 23.127720 & E: 89.520434 |                            | 45.1             | 32.5             |            | 36.8             | 30.2             | Silent Area |            |
| Bangladesh Standard                     |                                                          |                            |                  |                  |            |                  |                  | Day Time    | Night Time |
| Industrial Area                         |                                                          |                            |                  |                  |            |                  |                  | 75          | 70         |
| Commercial Area                         |                                                          |                            |                  |                  |            |                  |                  | 70          | 60         |
| Mixed Area                              |                                                          |                            |                  |                  |            |                  |                  | 60          | 50         |
| Residential Area                        |                                                          |                            |                  |                  |            |                  |                  | 55          | 45         |
| Silent Area                             |                                                          |                            |                  |                  |            |                  |                  | 50          | 40         |
| World Bank/IFC Standard                 |                                                          |                            |                  |                  |            |                  |                  | Day Time    | Night Time |
| Industrial Area                         |                                                          |                            |                  |                  |            |                  |                  | 70          | 70         |
| Residential; Institutional; Educational |                                                          |                            |                  |                  |            |                  |                  | 55          | 45         |

Sources: Monitoring Report (Annexure-II)

## 5.7 Air Quality Parameters

To establish the baseline air quality of the study area, monitoring was conducted at a total of eight locations following ToR. The detailed results of this monitoring are provided in Annexure-II.

Table 5.5: Air quality parameter around the project site.

| Sl. No.                                   | Sampling Location & ID                                          | Concentration present different parameter in ambient air |                        |                         |                         |                           |                        |                           |                   |                |
|-------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------|------------------------|-------------------------|-------------------------|---------------------------|------------------------|---------------------------|-------------------|----------------|
|                                           |                                                                 | SPM                                                      | SO <sub>2</sub>        | NO <sub>2</sub>         | CO                      | O <sub>3</sub>            | Pb                     | NH <sub>3</sub>           | CO <sub>2</sub>   | O <sub>2</sub> |
| 01                                        | East side of the Project                                        | 46                                                       | 4.1                    | 6.5                     | 0.24                    | 1.2                       | BDL                    | 0.55                      | 217               | 3.1            |
| 02                                        | West side of the Project                                        | 41                                                       | 4.0                    | 6.4                     | 0.25                    | 1.3                       | BDL                    | 0.52                      | 214               | 3.1            |
| 03                                        | North side of the Project<br>In front of Project Main Gate Area | 59                                                       | 4.2                    | 6.8                     | 0.25                    | 1.2                       | BDL                    | 0.53                      | 213               | 3.2            |
| 04                                        | South side of the Project                                       | 51                                                       | 4.3                    | 6.9                     | 0.22                    | 1.1                       | BDL                    | 0.50                      | 204               | 3.0            |
| Unit                                      |                                                                 | µg/m <sup>3</sup>                                        | µg/m <sup>3</sup>      | µg/m <sup>3</sup>       | PPM                     | µg/m <sup>3</sup>         | µg/m <sup>3</sup>      | µg/m <sup>3</sup>         | µg/m <sup>3</sup> | %              |
| Duration (Hour)                           |                                                                 | 24                                                       | 24                     | 24                      | 8                       | 8                         | 24                     | 24                        | 8                 | 8              |
| Method of Analysis                        |                                                                 | Gravimetric                                              | West-Gaeke             | Jacob and Hochheiser    | Electro-Chemical Sensor | Spectrophotometric Method | AAS                    | Spectrophotometric Method |                   |                |
| Bangladesh (DoE) Standard for Ambient Air |                                                                 | 200                                                      | 80                     | 80                      | 5                       | 100                       | 10                     | 400                       | 10,000            | NYS            |
| IFC/ WB Standard                          |                                                                 | 230 (24H) <sup>a</sup>                                   | 125 (24H) <sup>a</sup> | 40 (24H) <sup>a,b</sup> | 7000 (24H) <sup>b</sup> | 160 (8H) <sup>a</sup>     | 0.5 (24H) <sup>a</sup> | NF                        | NF                | NF             |

**Abbreviation:** 1. Suspended Particulate Matter (SPM), 2. Oxides of Nitrogen (NO<sub>x</sub>), 3. Sulphur Di-Oxide (SO<sub>2</sub>), 4. Carbone Mono-Oxide (CO), 5. Ozone (O<sub>3</sub>), 6. Lead (Pb), 7. Ammonia (NH<sub>3</sub>), 8. Carbon di-oxide (CO<sub>2</sub>), 9. Oxygen (O<sub>2</sub>), 10. World Bank (WB) & 11. International Finance Corporation (IFC). 12. Department of Environment (DoE), and 13. Below Detection Limit (BDL).

Sources: Monitoring Report (Annexure-II)

## 5.8 Regional Disasters

### Seismicity:

Bangladesh is possibly one of the country's most vulnerable to potential earthquake threat and damage. Earthquake vulnerability of any place largely depends on its geology and topography, population density, building density and quality, and finally the coping strategy of its people and it shows clear spatial variations. Geographically Bangladesh is located close to the boundary of two active plates: The Indian plate in the west and the Eurasian plate in the east and north. As a result, the country is always under a potential threat of earthquake of any magnitude at any time, which might cause catastrophic devastation in less than a minute. On the basis of distribution of earthquake epicenters and morphotectonic behavior of different tectonic blocks Bangladesh has been divided into four generalized seismic zones.

*Table 5.6: Zone Wise Earthquake Information in Bangladesh*

| Zone       | Coefficient | Remark                     |
|------------|-------------|----------------------------|
| Zone - I   | 0.12        | Low seismic intensity      |
| Zone - II  | 0.20        | Moderate seismic intensity |
| Zone – III | 0.28        | Severe                     |
| Zone - IV  | 0.36        | Very severe                |

The north-eastern region of Bangladesh is considered as Zone - IV with the value of basic seismic coefficient  $z=0.36$ . This zone has high seismic risk. The district Rangpur, Tangail etc. are situated in Zone - III. The basic seismic coefficient of this zone is  $z=0.28$ . The central part of Bangladesh is considered as Zone - II. The capital of Bangladesh, Dhaka is in this zone. The basic seismic co-efficient of this zone is  $z=0.20$ . The southwestern part of Bangladesh is considered as Zone - I. This zone is comparatively safe zone. The basic seismic co-efficient of this zone is  $z = 0.12$ . **Narail district** is situated in the seismic Zone - I, which has a basic seismic coefficient,  $z = 0.12$ .



Figure 5.11: Seismic Zone of Bangladesh

## **5.9 Biological Environment**

### **5.9.1 General Consideration**

Forests, pasture lands, rivers, surface water and other water bodies, etc. are the most important natural ecosystems. They are the foundation on which conservation of biological diversity depends. Biological diversity, which refers to genetic variation as well as to the diversity of human populations and ecosystems, is a resource that belongs not only to regions and to nations but also to all of humankind. Although it is a renewable resource, it can be irreversibly destroyed. Future uses of this resource (medicine, plant breeding. etc.) cannot be foreseen at present, although they will certainly be extensive in scope, and they even are crucial to the survival of humankind. It is extremely rare to encounter completely natural areas nowadays. On the other hand, both extensive and local use of natural flora and fauna can be regarded as normal occurrences in natural ecosystems. Although the transition from hunting and gathering to settle agriculture in established agro-ecological zones is complete almost everywhere, traditional forms of resource use continue to play an important role in the lives of rural populations. Current pressure due to increase production and extend the area of land under cultivation is leading to more intensive use of remaining predominantly natural areas. This results in environmental stress and rapid loss of biological diversity, as well as permanent conversion of land to agricultural use. Opening up natural areas in order to exploit their resources with modern technology frequently leads to additional forms of resource use. For example, forests opened up to commercial forestry are more exposed to uncontrolled over exploitation, as well as being subjected to ecological stress by migrants who practice agriculture. There had been extensive field survey in the project area during the study to assess and also quantify to a certain extent the flora and fauna richness. The area is quite rich in flora and fauna. However, many of those are quite common for different other areas in Bangladesh. The already existing industries in the study area not just brought, some of the utility services, but have also provided with a different look of infrastructure setting in the area. This is still not something, which can be called aesthetically unacceptable or directly detrimental to the floral growth of the area. However, the industrial activities along with their discharges may prove quite detrimental to both flora and fauna in the area eventually, provided no appropriate corrective measures are taken.

### **5.9.2 Flora**

In Narail District, agricultural land use is predominantly characterized by cultivation of local and high-yielding varieties (HYV) of rice, jute, vegetables, spices, pulses, and oilseeds. Agriculture remains the primary livelihood source for the majority of the rural population in the district.

Although there is no large-scale organized forest area, the landscape is largely covered by homestead vegetation and agroforestry systems. These homestead forests consist of a wide variety of fruit-bearing, timber, and shade-providing trees that contribute significantly to local biodiversity, household income, and ecological balance. Common fruit trees include mango (*Mangifera indica*), jackfruit (*Artocarpus heterophyllus*), banana (*Musa spp.*), guava (*Psidium guajava*), litchi (*Litchi chinensis*), papaya (*Carica papaya*), tamarind (*Tamarindus indica*), and date palm (*Phoenix sylvestris*).

Timber and multipurpose trees such as mahogany (*Swietenia macrophylla*), rain tree (*Albizia saman*), eucalyptus (*Eucalyptus spp.*), neem (*Azadirachta indica*), banyan (*Ficus benghalensis*), and bamboo species are widely found and used for household construction, fuelwood, and furniture making. Coconut (*Cocos nucifera*) and betel nut (*Areca catechu*) are also commonly cultivated and serve as important sources of household income in many areas.

In addition, wetland and marshy areas support various aquatic vegetation and grasses used for mat-making, thatching, and handicrafts, contributing to traditional livelihoods in rural communities.

Overall, the vegetation pattern in Narail District reflects a mix of agricultural land use, homestead forestry, and wetland-based ecosystems, which together support both ecological functions and rural economic activities. The baseline ecological characteristics of the area are important considerations for the environmental assessment of Kishan Accumulators Ltd., particularly in relation to greenbelt development and biodiversity conservation planning. (*Source: Agriculture Census, 2019*)

### **5.9.3 Fauna**

Narail District supports a moderate diversity of fauna, including mammals, birds, fish, reptiles, and amphibians, which are commonly associated with rural homestead ecosystems, agricultural

lands, and wetland environments. The faunal diversity of the area is influenced by its agro-ecological landscape, river systems, and seasonal wetlands.

**Mammals:** Common mammals found in the district include domesticated animals such as cattle (*Bos taurus*), goats (*Capra hircus*), buffalo, and poultry, which are widely associated with rural households. Wild and semi-wild mammals include house shrew (*Suncus murinus*), rats (*Rattus* spp., *Mus* spp.), mongoose (*Herpestes* spp.), squirrel species, and jackal (*Canis aureus*), which are typically found in rural settlements, croplands, and homestead vegetation areas.

**Birds:** The district is home to a wide variety of common and migratory bird species. Resident birds include crow (*Corvus splendens*), myna (*Acridotheres tristis*), kingfisher (*Alcedo atthis*), sparrow (*Passer domesticus*), drongo (*Dicrurus* spp.), cuckoo (*Cuculus* spp.), and various herons and egrets. Wetland areas support waterfowl and aquatic birds such as ducks, cormorants, bitterns, and other seasonal migratory species, particularly during the winter season.

**Fish:** Narail District contains a rich diversity of freshwater fish species due to its rivers, canals, and floodplain wetlands. Common indigenous fish include rohu (*Labeo rohita*), catla (*Catla catla*), mrigel (*Cirrhinus mrigala*), catfish species (*Mystus* spp.), shing (*Heteropneustes fossilis*), koi (*Anabas testudineus*), boal (*Wallago attu*), channa species (*Channa striata*), and pabda (*Ompok pabda*). Small indigenous fish species are also widely available in seasonal water bodies. In addition, exotic species such as tilapia (*Oreochromis niloticus*), silver carp (*Hypophthalmichthys molitrix*), and grass carp (*Ctenopharyngodon idella*) are cultivated in ponds for commercial aquaculture.

**Reptiles and Amphibians:** Reptilian fauna includes snakes (both non-venomous and venomous species such as cobra – *Naja naja*), lizards, and turtles commonly found in wetlands and agricultural fields. Amphibians such as frogs (*Hoplobatrachus* spp.) and toads (*Bufo melanostictus*) are also present, particularly in moist habitats and near water bodies.

Overall, the faunal composition of Narail District reflects a typical agro-ecological and wetland-based ecosystem, where biodiversity is closely linked with agricultural practices and seasonal hydrological conditions. The baseline ecological conditions are important for assessing potential impacts of industrial development activities such as those associated with Kishan Accumulators Ltd., particularly in relation to habitat disturbance, emissions control, and greenbelt planning. (Source: Agriculture Census, 2019)

## **5.10 Socioeconomic Baseline Description**

### **5.10.1 General**

As part of the Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd., a socioeconomic baseline study was conducted in the surrounding areas of the project site located in Narail District. The study was based on field surveys, stakeholder consultations, and Key Informant Interviews (KIIs) with local residents, community representatives, and relevant government officials.

In addition, secondary data sources such as the Bangladesh Bureau of Statistics (BBS), Banglapedia, published reports, and other relevant literature were reviewed to support the assessment. Socioeconomic information was also collected from local administrative offices under Narail Sadar Upazila Parishad to ensure accuracy and relevance to the project area context.

### **5.10.2 Administrative Areas**

The proposed project is located at Uzirpur, Bokultola under Narail Sadar Upazila of Narail District, Bangladesh. Narail District is administratively divided into 3 (three) upazilas, namely Narail Sadar, Lohagara, and Kalia. Among these, Narail Sadar serves as the central administrative and economic hub of the district.

The upazilas of Narail District share similar geographical, cultural, and socioeconomic characteristics, with agriculture, small trade, and service-based activities being the primary livelihood sources. The project area falls under the jurisdiction of Narail Sadar Upazila, which provides administrative support and local governance coverage for the proposed industrial development.

### **5.10.3 Demographic Characteristics of the Project Area**

**Population and Demographics:** Population and Demographics: According to the 2022 Population and Housing Census of Bangladesh, Narail District has a total population of 788,671 people. This ranks Narail as one of the less populous districts in the country and the least populous within the Khulna Division. The population density is approximately 815 people per square kilometer across a total land area of roughly 968 square kilometers, reflecting a moderately dense, predominantly rural administrative region. The gender distribution within

the district shows a sex ratio of 94.71 males per 1,000 females, indicating a higher proportion of females in the population. The district's population is heavily distributed across rural localities, with 614,029 people residing in rural areas and 174,642 people living in urban centers, with Narail Sadar functioning as the primary administrative and urban hub.

**Religion, Literacy, and Economy:** Narail is a predominantly Muslim district, with Muslims making up 84.19% (663,961) of the population, while Hindus constitute a significant minority at 15.78% (124,465). Other religious groups, including Buddhists and Christians, represent a marginal fraction of the remaining population. The district boasts a notable literacy rate, with 74.66% of the population aged seven and above being literate (76.19% for males and 73.22% for females), which aligns closely with the national average and reflects steady regional educational development.

The economy of Narail is fundamentally grounded in agriculture and agro-based trade. The fertile deltaic landscape, supported by major river systems like the Chitra and Nabaganga, drives the widespread cultivation of paddy, jute, pulse crops, and seasonal fruits. Beyond traditional farming, inland freshwater fisheries, natural wetlands (beels), and seasonal agro-processing trades—such as chemical-free dry fish production—serve as critical economic lifelines. Trade, cottage industries, transport operations, and incoming local remittances further diversify income streams and sustain the local market infrastructure.

#### ***5.10.4 Utility Services of the Project Area***

##### **Water Supply**

For the proposed industrial facility of Kishan Accumulators Ltd., water is a key operational utility. The primary source of water will be groundwater abstraction through deep tube wells, which is commonly used in the Narail region for industrial, domestic, and agricultural purposes. In addition, the project will promote water reuse practices, particularly through treatment and recycling of process wastewater where feasible.

A dedicated water management system will be developed to ensure adequate water quality and supply for different operational needs, including production processes, cleaning, and domestic use. Water conservation measures will also be implemented to reduce overall consumption.

##### **Infrastructure**

The project will include an integrated internal water distribution system consisting of pumps, storage tanks, pipelines, and treatment units to ensure efficient water supply across different

sections of the facility. The system will be designed to support both production and domestic requirements.

### **Electricity Supply**

The project area in Narail District is connected to the national electricity grid, ensuring reliable power availability for industrial use. The electricity demand of Kishan Accumulators Ltd. will be supplied through a high-tension (HT) connection from the national grid, most likely under the Bangladesh Power Development Board (BPDB) distribution network.

To ensure uninterrupted operation, the project may also use backup generators during power outages. Energy efficiency measures and potential solar energy integration for auxiliary loads may also be considered.

### **Natural Gas**

The Narail region is partially connected to the national gas transmission and distribution system. However, depending on network availability at the project site, natural gas supply may be accessed through the nearest distribution line or alternative fuel sources such as diesel or LPG may be used for specific operational requirements.

Natural gas or alternative fuels will be used primarily for heating, industrial processes, and auxiliary systems, depending on final utility connectivity and feasibility.

### **Telecommunication and Internet Services**

#### **Infrastructure**

The project area is well connected to regional and national communication networks. All major mobile network operators in Bangladesh provide coverage in Narail District, ensuring reliable telecommunication access.

#### **Services**

The industrial facility of Kishan Accumulators Ltd. will be supported by modern communication systems, including broadband internet, internal office networking, and mobile communication facilities. Where required, fiber-optic connectivity and wireless systems will be used to ensure efficient administrative and operational communication.

## **CHAPTER 06**

### **PROJECT LOCATION & LAND USE**

## 6. PROJECT LOCATION & LAND USE

### 6.1 Project Location

The **Kishan Accumulators Ltd.** is located at **23.127414 ° N, 89.520820° E** in Uzirpur, Bokultola, Narail Sadar, Narail. The site is situated about Approximately 120 km southwest of the capital city, Dhaka.

The district encompasses a total area of **990.23 sq. km** (382.33 sq. miles). In terms of size, Narail is one of the smaller districts in Bangladesh, ranking 10th among the 10 districts of the Khulna Division and 61st among the 64 districts of the country. Narail district consists of 03 (three) upazilas, namely: **Narail Sadar, Kalia, and Lohagara**. The proposed project is strategically positioned within the Sadar Upazila to ensure optimized logistic access while maintaining environmental zoning standards.

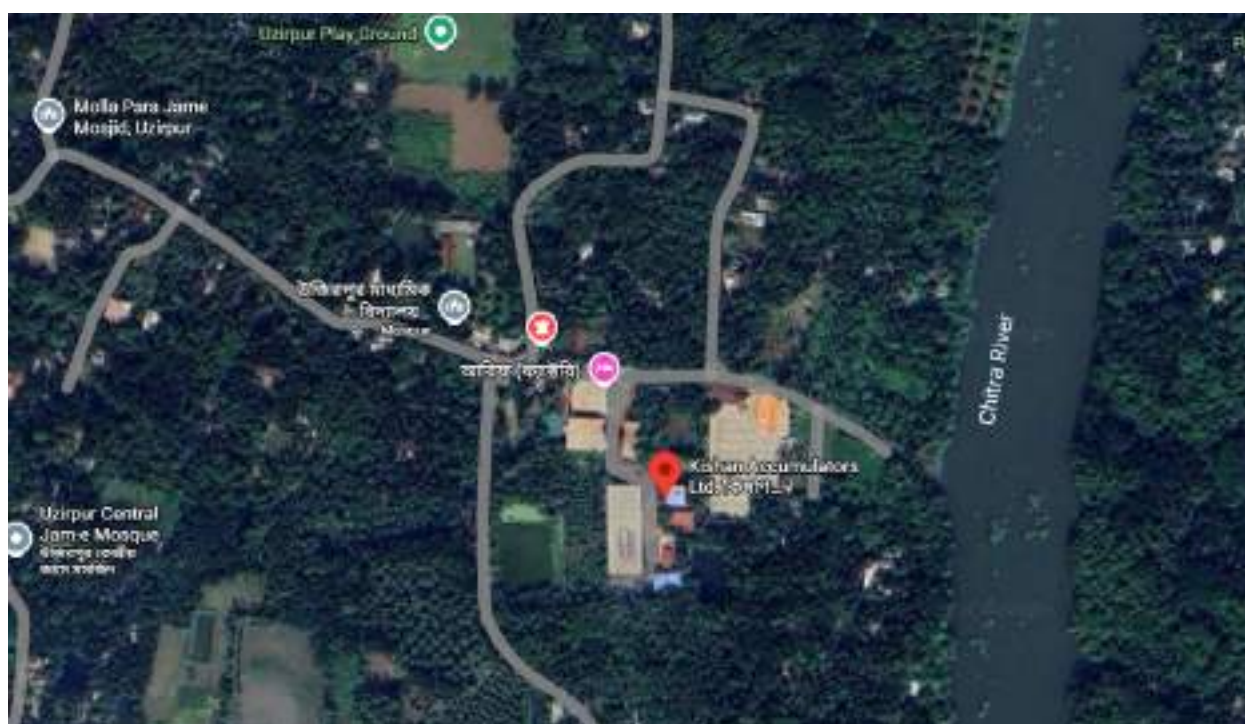


Figure 6.1: Location Map of the Kishan Accumulators Ltd



*Figure 6.2: Location of the Study Area Showing District and Upazila Distribution*

## **6.2 Present Use of the Land**

The project site at Uzirpur, Bokultola (23.127414° N, 89.520820° E) is currently a vacant, open plot that consists of flat, stable land. It is primarily covered with natural grass and low-lying shrubs. In Narail District, there are no officially declared Ecologically Critical Areas (ECAs) by the Department of Environment (DoE). Given picture depicts the site condition.

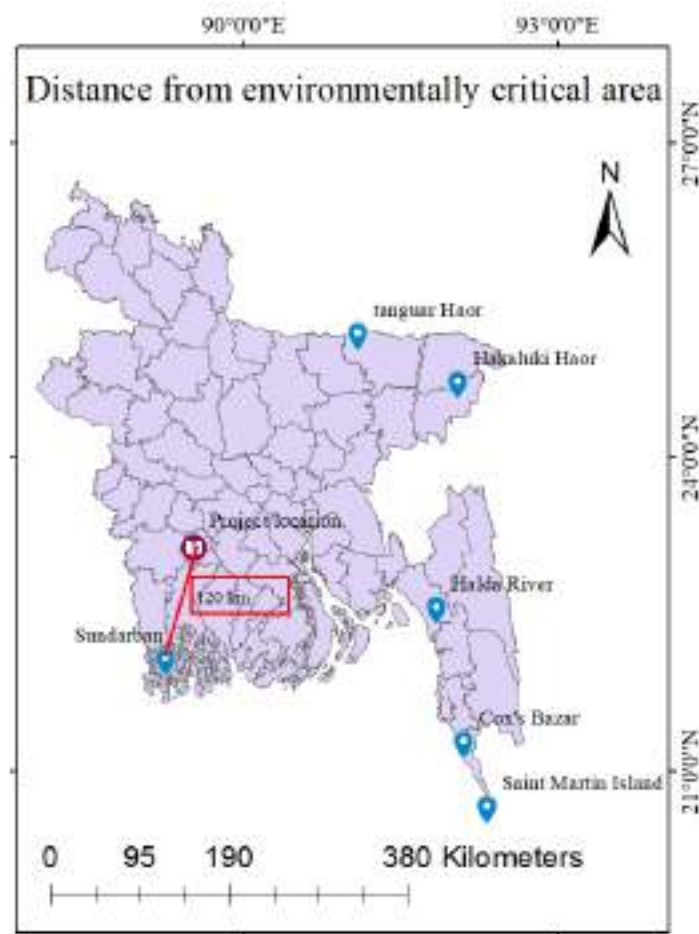


*Figure 6.3: Picture depicts the present site condition of the Project*

## **6.3 Distance from Environmentally Critical Area**

While no declared "Environmentally Critical Areas" (ECAs) are located directly within the project area, several globally and nationally significant ecological zones exist within the wider region. As illustrated in the map, the nearest declared ECA is the Sundarban Mangrove Forest, located approximately 120 km south-west of the designated project location.

Other major Ecologically Critical Areas of Bangladesh—such as Tanguar Haor and Hakaluki Haor to the north-east, and the Halda River, Cox's Bazar, and Saint Martin Island to the south-east—are situated at much greater distances. Because of this significant geographical separation, regular project operations are highly unlikely to cause any direct ecological or environmental degradation to these protected habitats.



*Figure 6.4: Distance from Ecologically Critical Area*

Furthermore, the project activities are confined to a localized industrial footprint with no physical connectivity to any protected wetland, forest, or coastal ecosystem. The anticipated emissions, wastewater discharge, and solid waste generation are expected to remain within the project boundary through the implementation of appropriate environmental management and pollution control measures. Therefore, considering the considerable spatial distance and controlled operational framework, the project is not expected to exert any significant cumulative or transboundary impact on the nationally recognized Ecologically Critical Areas (ECAs) of Bangladesh.

## **6.4 Satellite View of the Project Location**

Based on the satellite imagery, the site features a localized industrial footprint within a lush, semi-rural setting bordered to the east by the Chitra River. The central complex includes elongated industrial sheds belonging to Kishan Accumulators Ltd. and an adjacent factory, surrounded by internal access paths and paved clearings. The immediate vicinity is characterized by a dense green tree canopy interspersed with narrow, winding roads and prominent community landmarks, including Uzirpur Secondary School to the northwest, Uzirpur Play Ground to the north, and nearby local mosques.



*Figure 6.5: Location Map (Satellite View)*



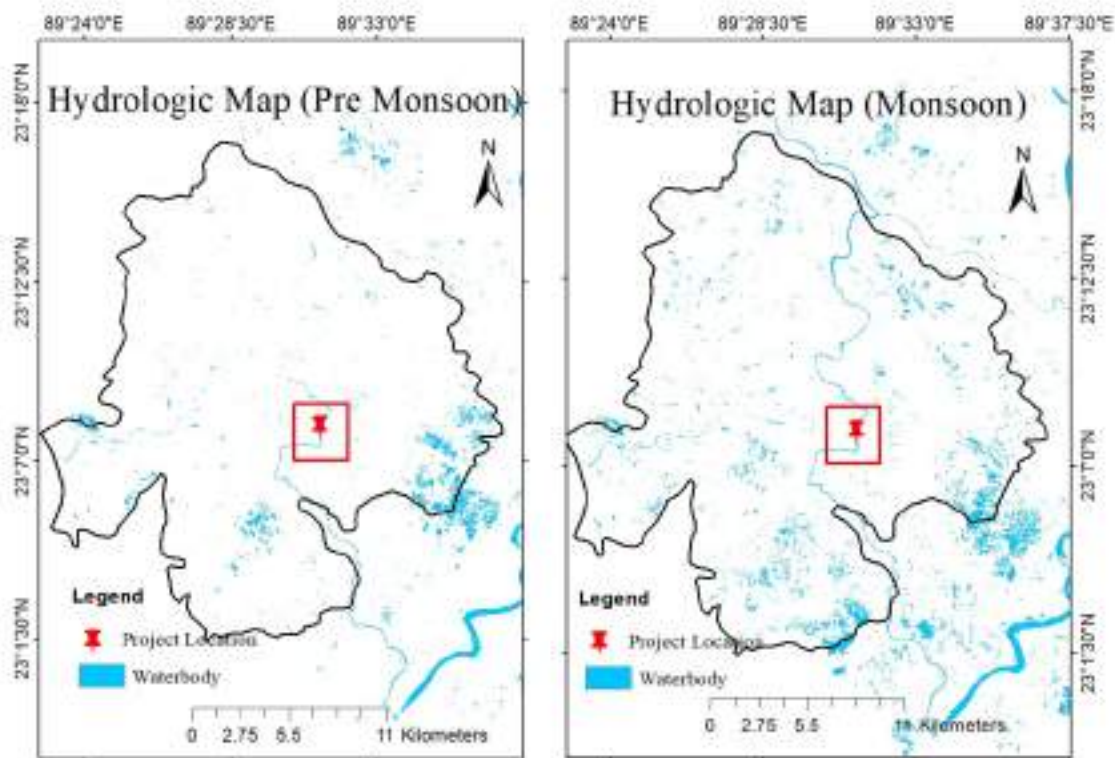
*Figure 6.6: Land Use Map with 5 km Radius (Satellite View)*

The satellite imagery illustrates a comprehensive regional overview centered around the designated project site 23.127414 ° N, 89.520820° E contained within a specified 5 km radius. The geography of the zone is heavily defined by the meandering course of the Chitra River, which cuts vertically through the landscape adjacent to the project location, shaping the surrounding environment. The terrain is overwhelmingly rural and riverine, dominated by an extensive, contiguous canopy of lush green vegetation, homestead forests, and widespread agricultural fields.

In terms of regional infrastructure and landmark distribution, the area is connected by the Z7030 regional highway passing horizontally to the west, and the R750 route running further north. Positioned near the northern boundary of the 5 km buffer zone along the Chitra River are notable local landmarks, specifically the historical Badha Ghat (Narail) and the Chitra Resort. Moving towards the southern and eastern extents of the radius, the landscape incorporates localized commercial hubs and infrastructure developments, including Bashgram Bazar situated near the southeastern edge, and the Gabra Bazar New Bridge along with its newly established connecting road network to the southwest. This highlights a classic Bangladeshi deltaic layout where community markets and transport nodes cluster tightly along major river channels and rural road corridors.

## 6.5 Hydrological Map

Based on the hydrological maps and the geographical characteristics of the Narail floodplain region, the total wetland coverage exhibits a dramatic seasonal shift relative to the total land area. During the pre-monsoon season, surface water is highly restricted, with permanent wetlands, perennial aquaculture ponds, and the main channel of the Chitra River occupying only about 4% to 8% of the total land area. However, with the onset of the monsoon, heavy seasonal precipitation and the rise of the river network cause extensive flooding across low-lying agricultural plains. This transforms the landscape, increasing the total surface wetland and temporary waterbody coverage to approximately 25% to 35% of the entire land area. This means that during peak monsoon months, roughly one-third of the surrounding landscape transitions into a water-saturated or inundated state, a critical hydrological factor for structural and drainage engineering design.

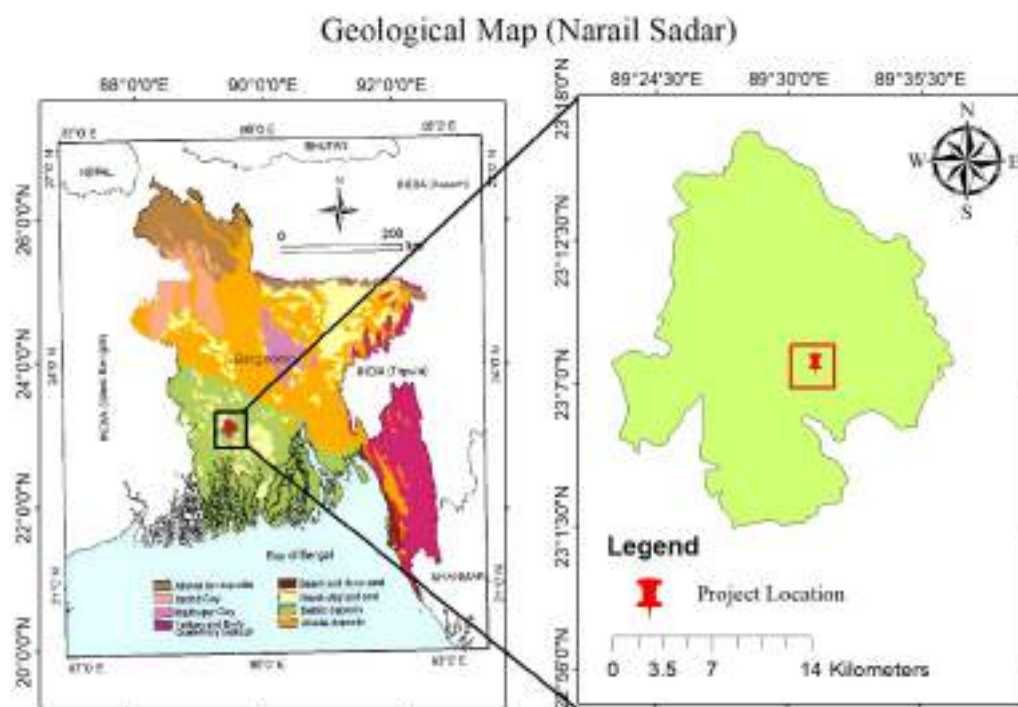


*Figure 6.7: Hydrological Map (GIS Analysis)*

## 6.6 Geological Map

The geological map of Narail Sadar indicates that the study area is located within the south-western floodplain region of Bangladesh, which is predominantly characterized by recent alluvial deposits. The regional geological setting, shown in the inset map of Bangladesh, highlights the distribution of different geological formations across the country and identifies the project location within the alluvial plain zone. This area mainly consists of unconsolidated sediments such as silt, clay, and fine sand deposited by the Ganges–Brahmaputra river system over time. These deposits are generally fertile and suitable for agriculture, which is the dominant land use in the region.

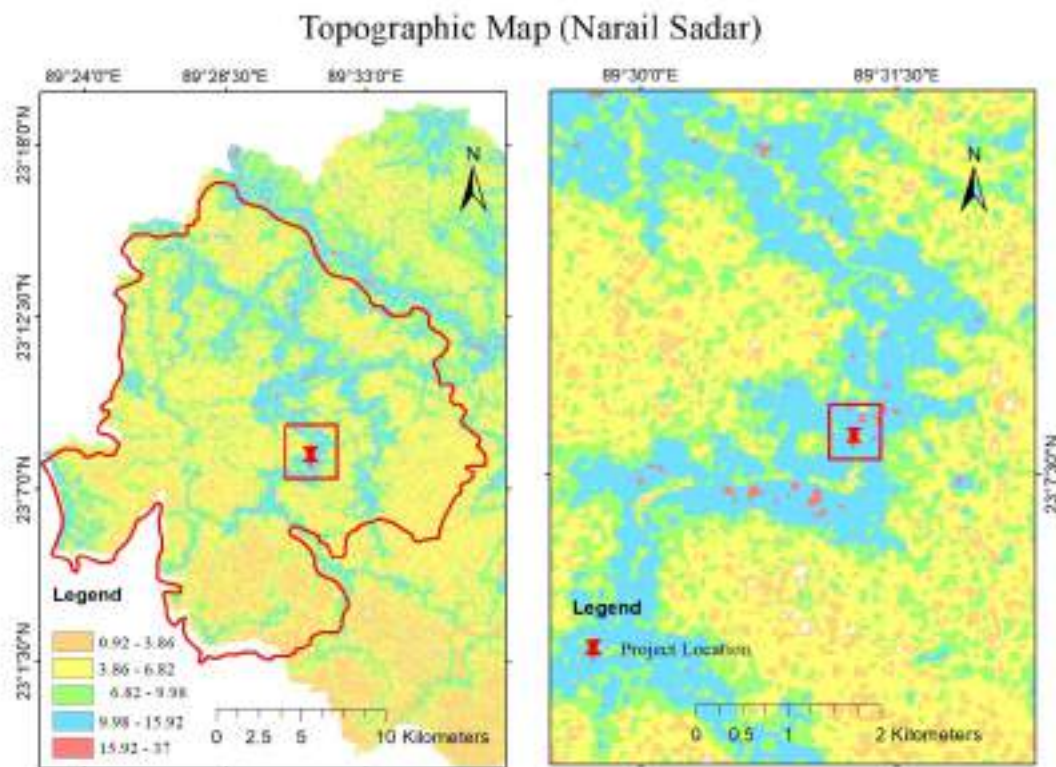
The enlarged map of Narail Sadar clearly marks the exact project location using a red pin symbol. The geological characteristics of the area suggest relatively soft and low-lying floodplain terrain with moderate groundwater availability and seasonal water retention capacity. Such geological conditions are typical of deltaic environments and may influence construction activities, drainage patterns, soil stability, and flood susceptibility. Therefore, proper consideration of soil composition, bearing capacity, and hydrological conditions is essential during project planning and implementation.



*Figure 6.8: Geological Map of the Area (GIS Analysis)*

## 6.7 Topographical Map

Based on the topographic map derived from the Digital Elevation Model (DEM) data, the specific project location marked by the yellow pin is situated within a highly flat, low-lying deltaic floodplain terrain. The area enclosed by the 5 km red buffer circle is overwhelmingly dominated by the lowest elevation bracket, which ranges from approximately 1.90 m to 5.82 m above mean sea level. This light-green zone represents active alluvial floodplains that are highly susceptible to seasonal water logging and inundation due to their minimal height above sea level. Branching directly through this low terrain, the dark blue linear networks delineate the lowest drainage depressions and river beds—including the Chitra River channel flowing directly adjacent to the project pin. Slightly higher transitional ridges and natural levees ranging from 5.82 m to 8.96 m (teal/medium green zone) are scattered along the perimeters of the circle, providing localized higher ground for settlements. Overall, the topography at the point-of-interest is distinctly low and flat, emphasizing the critical engineering need for elevated structural plinths and rigorous flood-resilient infrastructure planning.



*Figure 6.9: Topographical map of the Area (GIS Analysis)*

**CHAPTER 07**

**IDENTIFICATION, EVALUATION OF  
POTENTIAL IMPACTS &  
MITIGATION MEASURES**

## **7. IDENTIFICATION, EVALUATION OF POTENTIAL IMPACTS & MITIGATION MEASURES**

In most industrial and manufacturing projects, potential adverse environmental and social impacts generally outweigh the direct beneficial impacts during the construction and operational phases. Various project activities associated with the proposed operations of Kishan Accumulators Ltd. have been described in Chapter 3 (Project Description) of this EIA report. Based on those activities, this chapter identifies and evaluates the potential positive and negative impacts that may arise from the establishment and operation of the Lead Acid Starter Battery (LAS) manufacturing facility, forming a fundamental component of the environmental impact assessment process.

Although broader regional and national economic benefits are not usually the primary focus of an Environmental Impact Assessment (EIA), such benefits have also been considered in this study. The proposed project is expected to contribute to local employment generation, industrial growth, and economic development in the surrounding area. In the long term, these socioeconomic benefits may support improvements in livelihood opportunities and overall quality of life within the project influence area, provided that environmental management and mitigation measures are properly implemented throughout the project lifecycle.

### **7.1 Scoping of Impacts**

Since **Kishan Accumulators Ltd.** is a proposed industrial development project involving Lead Acid Starter Battery (LAS) manufacturing, the scoping of environmental impacts has been carried out considering both the construction and operational phases of the facility. The identification and assessment of potential impacts have been limited to project-specific activities described in Chapter 3 (Project Description) of this report.

Identification of potential environmental and social impacts associated with the project location and operation has been conducted using a checklist-based approach. Checklists are comprehensive tools for systematically identifying environmental effects and impact indicators, designed to support structured thinking on the possible consequences of proposed development actions (Munn, 1979). To develop the checklist and analyze associated environmental impacts, a multidisciplinary team from the consultancy conducted multiple site

visits to the project area, carefully observed planned activities, and identified the environmental components likely to be affected.

During the field visits, project personnel were consulted to understand operational processes and their awareness of potential environmental interactions. In addition, local stakeholders and nearby community members were also engaged through informal interviews to assess their perception of environmental conditions and general awareness of environmental responsibilities. These consultations helped in identifying key environmental components and in strengthening environmental awareness among stakeholders associated with the project area.

Based on the scoping exercise, water quality, air quality, noise levels, soil condition, and overall environmental management practices were identified as the most significant environmental components potentially affected by the project. Key environmental concerns include wastewater management, solid waste handling, stormwater drainage, occupational health and safety, and maintenance of environmental management systems throughout project implementation.

For the development of this Environmental Impact Assessment (EIA), emphasis has been placed on the effective management of both construction and operational phase activities. Relevant environmental management measures have been integrated into the Environmental Management Plan (EMP) to ensure proactive mitigation of potential impacts. The objective is to enable Kishan Accumulators Ltd. to adopt preventive and corrective measures that minimize adverse environmental and socio-economic impacts and ensure compliance with applicable environmental standards.

The impact checklists presented in Tables 7.1, 7.2, and 7.3 identify major project activities with the potential to cause Significant Environmental Impacts (SEIs). The magnitude and duration of these impacts have been systematically categorized as none, minor, moderate, and major in terms of severity, and short-term and long-term in terms of duration. This classification provides a structured framework for evaluating environmental risks and guiding the formulation of appropriate mitigation measures.

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

*Table 7.1: Checklist for identification of probable Environmental Impact of the project (Plant Location)*

| Project Phase         | Action Affecting Environmental Resources and Values |                                                           | SEIs without Mitigation Measures |       |          |       | Impact Type |            |            |              | Duration   |           |
|-----------------------|-----------------------------------------------------|-----------------------------------------------------------|----------------------------------|-------|----------|-------|-------------|------------|------------|--------------|------------|-----------|
|                       |                                                     |                                                           | None                             | Minor | Moderate | Major | Adverse     | Beneficial | Reversible | Irreversible | Short Term | Long Term |
| <i>Plant Location</i> | a                                                   | Loss of and displacement from homestead land              | ✓                                |       |          |       |             |            |            |              |            |           |
|                       | b                                                   | Overland Drainage and Impact on surface water             |                                  | ✓     |          |       | ✓           |            |            | ✓            |            | ✓         |
|                       | c                                                   | Impact on ground water                                    |                                  |       | ✓        |       | ✓           |            | ✓          |              |            | ✓         |
|                       | d                                                   | Change in Landscape                                       |                                  | ✓     |          |       | ✓           |            |            | ✓            |            | ✓         |
|                       | e                                                   | Loss of and displacement from agricultural land and house | ✓                                |       |          |       |             |            |            |              |            |           |
|                       | f                                                   | Disruption of Earth Surface                               |                                  | ✓     |          |       | ✓           |            |            | ✓            |            | ✓         |
|                       | g                                                   | Inadequacy of Buffer Zone                                 |                                  | ✓     |          |       | ✓           |            | ✓          |              |            | ✓         |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

*Table 7.2: Checklist for identification of probable Environmental Impact of the project (Plant Construction).*

| Project Phase             | Action Affecting Environmental Resources and Values | SEIs without Mitigation Measures |       |          |       | Impact Type |            |            |              | Duration   |           |
|---------------------------|-----------------------------------------------------|----------------------------------|-------|----------|-------|-------------|------------|------------|--------------|------------|-----------|
|                           |                                                     | None                             | Minor | Moderate | Major | Adverse     | Beneficial | Reversible | Irreversible | Short Term | Long Term |
| <i>Plant Construction</i> | Air pollution                                       |                                  | ✓     |          |       | ✓           |            |            | ✓            | ✓          |           |
|                           | Noise Pollution and vibration affect                |                                  | ✓     |          |       | ✓           |            |            | ✓            | ✓          |           |
|                           | Spreading diseases                                  |                                  | ✓     |          |       | ✓           |            |            | ✓            |            | ✓         |
|                           | Accidents                                           |                                  | ✓     |          |       | ✓           |            |            | ✓            |            | ✓         |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

Table 7.3: Checklist for identification of probable Environmental Impact of the project (Operation of the Plant).

| Project Phase                 | Action Affecting Environmental Resources and Values |                                                                                 | Effect on Environment and Economy                                            | SEIs without Mitigation Measures |       |          |       | Impact Type |            |            |              | Duration   |           |
|-------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------|-------|----------|-------|-------------|------------|------------|--------------|------------|-----------|
|                               |                                                     |                                                                                 |                                                                              | None                             | Minor | Moderate | Major | Adverse     | Beneficial | Reversible | Irreversible | Short Term | Long Term |
| <i>Operation of the Plant</i> | Operation stage of project                          |                                                                                 |                                                                              |                                  |       |          |       |             |            |            |              |            |           |
|                               | a                                                   | Noise Pollution                                                                 | Noise Generated from Electro mechanical machinery                            |                                  |       | ✓        |       | ✓           |            | ✓          |              |            | ✓         |
|                               | b                                                   | Water Pollution                                                                 | Untreated liquid wastewater and sewage discharge can pollute the environment |                                  |       |          | ✓     | ✓           |            | ✓          |              |            | ✓         |
|                               | c                                                   | Air pollution from Production Process                                           |                                                                              |                                  |       |          | ✓     | ✓           |            | ✓          |              |            | ✓         |
|                               | d                                                   | Solid Wastes from daily activities as well as from routine maintenance work     |                                                                              |                                  |       |          | ✓     | ✓           |            | ✓          |              |            | ✓         |
|                               | e                                                   | Soil contamination from accidental spillage of hazardous materials such as lead |                                                                              |                                  |       |          | ✓     | ✓           |            |            | ✓            |            | ✓         |
|                               | f                                                   | Groundwater Pollution from wastewater                                           |                                                                              |                                  |       |          | ✓     | ✓           |            | ✓          |              |            | ✓         |
|                               | g                                                   | Natural and Accidental Hazard                                                   |                                                                              |                                  |       | ✓        |       | ✓           |            |            | ✓            |            | ✓         |
|                               | h                                                   | Employment- Recruitment of new staffs and operators                             |                                                                              |                                  |       |          | ✓     |             | ✓          | ✓          |              |            | ✓         |

The Impacts, which are likely to be occurred in the different phases of the project, are identified in the checklist. Evaluation of these impacts will be done in the following sections mentioning their origin and characteristics, actual site condition, implemented mitigation measures along with the possible enhancement of mitigation/enhancing measures. At the end of each sub section, status of residual impact will also be mentioned.

## **7.2 Evaluation of Predicated Adverse Impacts and Mitigation**

### **7.2.1 Impact due to Project Location**

#### **Overland Drainage and Impact on surface water**

##### **Impact:**

The potential impacts on local hydrology are principally those of altered patterns as a result of onside construction and earthwork activities. The proposed project will affect natural drainage, surface and ground water quality if not managed the construction works properly.

##### **Mitigation:**

- Surface drainage is controlled to divert surface runoff away from the construction area;
- Completed areas are restored/re-vegetated;
- Containment of sanitary waste are adequately disposed of to avoid surface and ground water contamination.
- Adequate provision has to be retained for the treatment and disposal of cuttings, drilling fluids and other chemicals and lube oil wastes generated during drilling, testing and commissioning stage.

#### **Impact on Groundwater**

The project's demand for water from the ground poses a significant risk to groundwater resources. The continuous extraction of large volumes of water can lead to a considerable drop in the water table. This can affect the availability of water for local communities.

##### **Mitigation:**

- Implement a comprehensive monitoring program to track water levels in the local aquifer.

- Utilize water-efficient technologies in all production processes to reduce the amount of groundwater withdrawn.
- Explore alternative water sources to lessen the project's reliance on groundwater.
- Implement a wastewater recycling system to treat and reuse process water, minimizing the need for new water extraction.
- Establish buffer green spaces and permeable surfaces within the factory premises to promote the natural recharge of groundwater. These areas will allow rainwater to infiltrate the soil, replenishing the aquifer.

### **Change in Landscape**

#### **Impact Origin:**

A landscape is a subjective concept that cannot be precisely quantified. However, in general, any project when not designed considering the local landscape, then it creates visual intrusion to the people. The proposed project may change the local landscape to some extent.

#### **Mitigation Measure:**

Any built up part of the plant are designed considering key criteria of landscape like coherence, readability, hierarchy and stability. It is understood that the infrastructure is have a modern architectural view with all facilities available, which does not provide any significant visual intrusion.

### **Loss of and Displacement from Agricultural land and House**

For economic development, Bangladesh has no option other than going for industrialization. To do so, some portion of land would have to be converted to industrial land. But attention should be given so that conversion of such land use should take place in comparatively less fertile area. The proposed project will be established within the existing premises of their own land facility. Therefore, the issue of displacement from agricultural land and houses is not relevant to this project. The adjacent land has already been converted to industrial use, and all prior land-use and acquisition matters addressed.

## **Disruption of Earth Surface**

### **Impact Origin:**

Establishment of the project hasn't disrupted the natural surface of earth & thus will not obstruct the natural drainage system of the area.

### **Mitigation measures:**

Since, the land development has been done efficiently, so no more mitigation measures need to be adopted.

## **Inadequacy of Buffer Zone**

### **Impact Origin:**

Buffer Zones are spaces, which provide natural environmental protection from damage by external events. These spaces, in between any development projects, are usually remaining vegetated which can provide windbreaks, erosion control, sediment traps, sound insulation and visual screening. However, industries should try to keep a certain open space within the factory premises which can be developed as a buffer strip.

### **Mitigating Measure:**

A six-acre area within the proposed plant will be maintained as a dedicated green space. This green area will serve as a buffer zone, contributing to the overall ecological balance of the site. It will be developed with adequate tree plantations, landscaped areas, and open spaces, providing environmental benefits such as windbreaks, noise reduction, and visual screening.

### ***7.2.2 Negative Impacts in the Context of Construction and their Mitigation***

During the construction phase of the project, several minor, adverse, and irreversible impacts have been identified. Air pollution will result from dust generated by earthworks and vehicle emissions. Similarly, noise pollution and vibrations will affect the immediate vicinity due to heavy machinery and construction activities. The presence of a large workforce could also lead to the spreading of diseases if proper sanitary and health protocols are not followed. Lastly, the potential for accidents exists on the construction site, which could result in injuries or fatalities. These impacts, while considered minor in scale, are adverse and, in the case of accidents, can have irreversible consequences.

## **Air pollution**

### **Source of Impacts:**

The area is predominated by sandy-clay soils. Sometimes sandy soil can pollute the air during heavy wind. It is anticipated that the air would be polluted with dust sand particles for the movement of light and heavy transport vehicles and during piling work. This air pollution may create some breathing problems to the workers.

### **Mitigation Measures:**

To reduce air pollution in site, attempt is normally made to complete the construction of infrastructures within the wet season. Due to high rainfall in this period, air and soil remain wet and dust particles cannot spread easily. If construction work is continued during dry period, dust control arrangement by sprinkler shall be placed.

## **Noise Pollution and Vibration Effect**

### **Source of Impacts:**

Noise and vibration are generated from various construction activities such as piling of foundation, crushing of stones and bricks and installation of machines and equipment, etc. In addition, working conversation of the labor force also enhances the noise pollution. The noise pollution and vibration create disturbance to the workers of the adjacent establishments and surrounding people involved in various activities as well as nearby staff quarter people.

### **Mitigation Measures:**

Generation of noise pollution and vibration are an integral component of any construction work that cannot be avoided completely. However, it is possible to take certain measures to reduce these levels to an acceptable level. Appropriate precautions and skilled operation of machines and equipment would contribute to reduce the nuisance. Precaution like selection of proper working period considering the comfortable time of the people working and living around should be followed for construction work. The construction work normally starts at about 8.00 am and continues until 6.00 pm at the plant site. Working beyond this period may create sound hazards to the local people and hence the above work period shall be enforced.

## **Spreading Diseases**

### **Source of Impacts:**

It is not unlikely that diseases may be spread among the construction workers as most of them are illiterate and their level of knowledge on health and hygiene is very low. They are not aware of water pollution, healthy accommodation and food poisoning. Moreover, due to high concentration of labor force during construction, unhygienic condition may be created in the vicinity and thereby the same may lead to transmission of various diseases. Thus, the worker may suffer from various diseases such as diarrhea, dysentery and skin infections. These diseases can spread from one worker to another and to the people living in the area.

### **Mitigation Measures:**

During construction phase, all of the impacts are reversible including spreading of diseases among the workers and the people working and living nearby. Moreover, the impacts are of short duration. In order to reduce or avoid the spreading of diseases, it is suggested that arrangement for good quality drinking water, hygienic sanitation and accommodation facilities for the staff and the workers shall be made. Frequent medical check-up would also be helpful in controlling the spreading of diseases. Emergency medical services and adequate first aid facilities should always be available at the site during construction period.

## **Accidents**

### **Sources of Impacts:**

Adequate precautionary measures will be undertaken at the project site to avoid any accident. However, accident is unexpected and it may occur any time during construction work and cause loss of lives and properties.

### **Mitigation Measures:**

A high level of precautions shall be undertaken that would reduce the occurrence of accidents remarkably. Adequate first aid facilities and emergency contacts to the adjacent health complexes and other emergency services will help to save the lives from accidents.

### **7.2.3 Impact at Due to Operation of the Project and their Mitigation**

Unjustified and unplanned Operation of any project can potentially affect quality of life, air, noise, water, land, flora, fauna and human by increase in water, noise and air pollution, increase in hazardous waste generation, pollution from spillage/surface runoff, disturbance to flora and fauna, by loss of trees resulting from increased access, increase in land values, threatening agriculture, etc. Environmental issues during the operational phase of the of the project have been identified for each of its components: Issues that need to be evaluated are mainly:

- ✓ Air Environment Impact (Major- Reversible- Long term)
- ✓ Water Environment: Water use and wastewater discharge (Major- Reversible- Long term)
- ✓ Noise Generation (Moderate- Reversible- Long term)
- ✓ Solid Waste Generation (Major- Reversible- Long term)
- ✓ Soil Contamination: Due to accidental spillage of hazardous waste like Lead and all (Major- Irreversible- Long term)
- ✓ Groundwater Impact (Major- Reversible- Long term)
- ✓ Natural and Accidental Hazard (Uncertain: Unknown);
- ✓ Employment Generation (Positive, Major- Reversible- Long term) etc.

#### **7.2.3.1 Impact on Air Quality**

##### **Impacts and Origin**

Air pollution during the operational phase of Kishan Accumulators Ltd. will primarily originate from lead melting, grid casting, lead oxide preparation, paste mixing, plate pasting, battery assembly, and acid handling operations. These activities may generate lead-containing particulate matter, lead fumes, acid mist, and process dust, which can adversely affect workplace air quality if not adequately controlled. In addition, emissions from the diesel-powered standby generator may contribute small quantities of particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), carbon monoxide (CO), and carbon dioxide (CO<sub>2</sub>).

Without effective air pollution control measures, airborne contaminants may disperse within the production areas and potentially affect the surrounding environment depending on meteorological conditions and operational practices. Occupational exposure to lead dust, lead fumes, and acid mist may pose significant health risks to workers through inhalation and direct

contact. Prolonged exposure can adversely affect the respiratory system, nervous system, kidneys, and overall worker health. Therefore, proper installation and maintenance of air pollution control systems, local exhaust ventilation, and occupational safety measures are essential to minimize environmental and health impacts.

### **Mitigation Measures**

For Kishan Accumulators Ltd., the Air Pollution Control System (APCS) measures can be revised as follows:

- Installation of dedicated Local Exhaust Ventilation (LEV) systems at all lead-emitting process units, including oxide preparation, grid casting, paste mixing, plate formation, and battery assembly sections.
- Installation of wet scrubbers at acid mist and gaseous emission sources to effectively control sulfuric acid fumes and other harmful gaseous pollutants before discharge into the atmosphere.
- Installation of dry scrubbers and high-efficiency filtration systems (Bag Filters/HEPA Filters) at lead dust-generating operations to capture particulate matter and airborne lead compounds.
- Proper enclosure and isolation of lead melting, casting, oxide production, paste mixing, and plate processing units to prevent fugitive emissions within the workplace.
- Implementation of regular housekeeping programs using industrial vacuum cleaning systems and wet-cleaning methods; dry sweeping shall be strictly prohibited.
- Continuous maintenance and periodic performance evaluation of scrubbers, filters, ducts, fans, and associated APCS equipment to ensure optimum pollution control efficiency.
- Periodic monitoring of stack emissions, ambient air quality, and workplace air quality, particularly for lead (Pb), particulate matter (PM), and acid mist concentrations.
- Mandatory use of appropriate Personal Protective Equipment (PPE), including respirators, dust masks, gloves, and protective clothing for workers exposed to lead-bearing materials and airborne contaminants.
- Proper collection, handling, and recycling/disposal of dust and sludge generated from APCS units in accordance with environmental regulations and hazardous waste management practices.

### **7.2.3.2 Impact on Water Environment**

#### **Impacts and Origin**

The proposed Lead Acid Starter Battery (LAS) manufacturing facility will generate approximately 2.90 m<sup>3</sup>/day of industrial wastewater from various production sections. Wastewater will primarily originate from the Pasting, Curing, Initial Battery (IB), Formation, Washing-Drying, VRLA Charging, and Solar Charging sections. These activities involve equipment washing, plate processing, battery formation, charging operations, and floor cleaning. Similar wastewater sources are commonly reported in battery manufacturing industries, particularly from pasting, curing, formation, and washing operations.

Among the different sections, the Curing, IB, Formation, Washing-Drying, and Solar Charging units each contribute approximately 0.50 m<sup>3</sup>/day, while the Pasting and VRLA Charging sections generate 0.20 m<sup>3</sup>/day each. The total industrial wastewater generation of the project is estimated at 2.90 m<sup>3</sup>/day, which will be collected and treated through the proposed Effluent Treatment Plant (ETP) prior to reuse or disposal in compliance with environmental regulations.

The estimated industrial wastewater generation from the proposed Lead Acid Starter Battery (LAS) manufacturing facility is 2.90 m<sup>3</sup>/day. However, to accommodate future expansion, flow fluctuations, peak wastewater generation, and operational safety factors, the proposed Chemical ETP has been designed with a treatment capacity of 5.0 m<sup>3</sup>/day. The ETP will operate for 10 hours per day, resulting in a design treatment flow rate of 0.50 m<sup>3</sup>/hour.

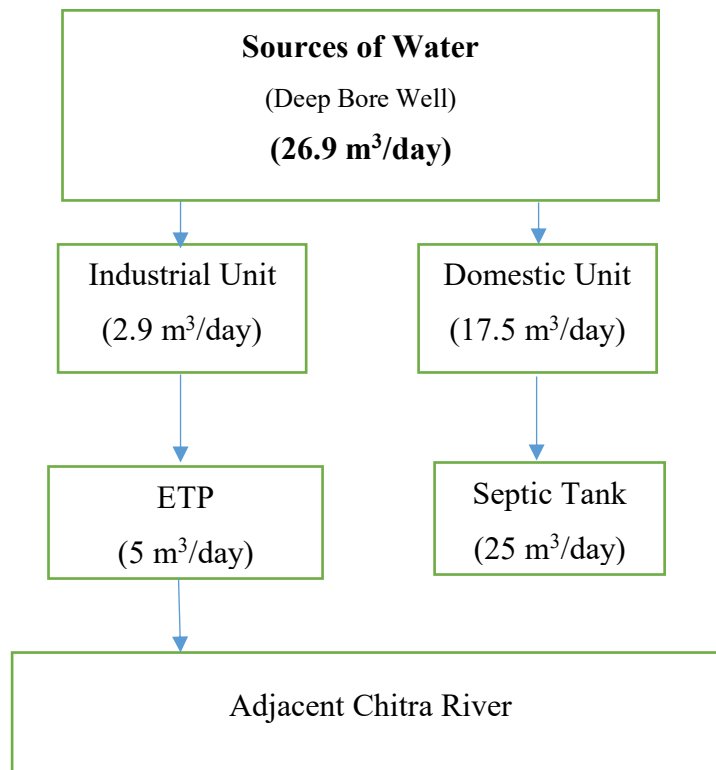
The proposed battery manufacturing facility will require approximately 24.0 m<sup>3</sup>/day of water for domestic and utility purposes. The major water demand will be for firefighting purposes (20.0 m<sup>3</sup>/day), followed by domestic uses such as sanitation, cleaning, drinking water (RO), canteen facilities, and construction activities (2.0 m<sup>3</sup>/day). In addition, 1.0 m<sup>3</sup>/day will be required for utility purposes and 1.0 m<sup>3</sup>/day for other miscellaneous activities.

Domestic wastewater generated from sanitary facilities and other non-industrial activities will be managed through a Septic Tank and Soak Pit System. The septic tank will provide primary treatment by settling solids and reducing organic matter, while the soak pit will facilitate the infiltration of treated effluent into the surrounding soil. This system is suitable for handling domestic sewage generated by the facility and will ensure environmentally sound wastewater management.

*Table 7.4: Wastewater Management at a Glance*

| <b>Wastewater Generation</b>                               | <b>Management</b>                                                                                                  |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Industrial WW Generation:<br>About 2.9 m <sup>3</sup> /day | For treating the wastewater a Chemical ETP has been designed with a treatment capacity of 5.0 m <sup>3</sup> /day. |
| Domestic wastewater: 24 m <sup>3</sup> /day                | Black water will be treated by septic tank and soak pit system for the time being.                                 |

**Wastewater Generation and Management Overview**



*Figure 7.1: Wastewater Generation and Management at a Glance*

### **7.2.3.3 Impact Acoustic Environment**

#### **Impacts and Origin**

Noise pollution arises from continuous operation of electro-mechanical equipment such as mixers, compressors, cutting machines, casting units, and material handling systems. The combined effect of multiple machines operating simultaneously may lead to elevated noise levels within the production zone. Although the impact remains largely confined within the industrial premises, prolonged exposure can affect worker health and productivity.

Without control measures, long-term exposure may result in hearing discomfort and stress-related occupational health issues.

#### **Mitigation Measures**

- Installation of **acoustic enclosures** for high-noise machinery
- Use of low-noise equipment where possible
- Regular maintenance and lubrication of machinery
- Limiting exposure duration for workers
- Provision of PPE (earplugs/earmuffs)
- Noise shielding by barriers or buildings
- Creating a green belt nearer main gate area
- Regular noise quality monitoring at the site

### **7.2.3.4 Impact due to Solid Waste Generation**

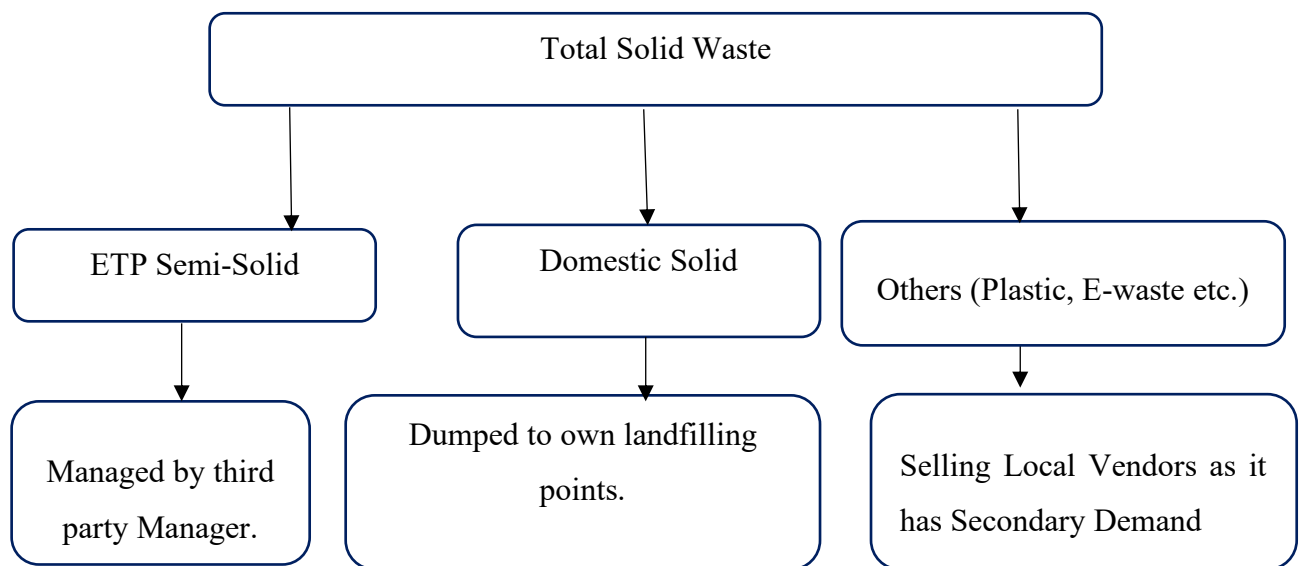
#### **Impacts and Origin:**

Solid waste will be generated from multiple stages of production including scrap lead, rejected plates, plastic waste, packaging materials, and sludge from wastewater treatment processes. Hazardous wastes such as lead scrap and contaminated sludge pose significant environmental risks if improperly handled. Improper storage or disposal may lead to secondary contamination of soil and water systems.

Over time, accumulation of unmanaged waste may also create long-term environmental liabilities.

### **Mitigation Measures**

- Segregation of hazardous and non-hazardous waste
- Recycling of lead scrap through authorized recyclers
- Safe sludge handling and disposal system
- Waste minimization practices in production
- Proper documentation and tracking



*Figure 7.2: Solid Waste Management Overview of the Project*

#### **7.2.3.5 Increase in Vehicular Traffic in the Area**

Impact Origin:

Increase in vehicular traffic in the area is likely to be experienced during operational hours of the project. Increased vehicular traffic in the area is likely to result from:

- ✓ Personal vehicles belonging to employees;
- ✓ Service provision vehicles such as garbage collection trucks;
- ✓ Emergency service vehicles such as fire engines;
- ✓ Potential negative impacts from increased vehicular traffic;
- ✓ Possible traffic congestion of local roads and lanes;
- ✓ Possible occasional experience of delays on the said local roads;
- ✓ Increased number of vehicles on roads will result in increased wear and tear of local roads thus reducing lifespan of affected roads;
- ✓ Cost of maintaining roads will increase;
- ✓ There will be more noise from increased vehicular traffic;
- ✓ There will be an increase of exhaust emission from vehicles which will pollute local atmospheric air.

#### **Mitigation measures:**

Following measures can be put in place to mitigate possible negative impacts likely to result from increase in vehicular traffic in the area:

- ✓ Management to pave the dilapidated service road with tarmac or more durable material;
- ✓ All users of said roads to always observe traffic rules this will give pedestrians and cyclist their space and safety while using the road;
- ✓ Marking of the roads to be clearly done;
- ✓ Horns and sirens near main gate should be strictly prohibited;

### **7.2.3.6 Impact on Health and Safety**

#### **Impact Origin:**

There might be hazards to operators, employees and technical personnel from working at the utility sections, store rooms, near boiler & generator etc. Provisions need to be made by the project for protecting occupational health, including protection of workers from hazards, fires etc. as well as protection of workers' health and assurance of safe drinking water supply and sanitation.

#### **Mitigating Measures:**

Safe and good occupational health status of the employees and workers is important for not only the persons working, but also for the operation and maintenance of the whole project. Regular medical check-up is to be done to ensure the soundness of health of the employees and workers. Pollution control measures are to be duly adopted as necessary, including noise and dust control, so that there would not be any negative occupational health impact. Insurance for all employees should be taken out.

The supervisors and operators should be regularly given training regarding safe operation and maintenance works. The use of PPEs will be strict for the workers working in dangerous zones and. First Aid boxes and firefighting equipment should be available at each section of the project.

### **7.2.3.7 Natural and Accidental Hazard**

#### **Impacts and Origin:**

Due to its geographical position the project area is prone to Natural Hazard like storm surge, heavy rainfall, earthquake etc. Like Natural accidental hazard are uncertain and unexpected. The impacts could be from small injury to devastating and deadly. The accidental hazard associated with the project is:

- ✓ Accident due to operate machinery
- ✓ Accident from boiler & generator
- ✓ Fire from factory

### **Mitigation measures:**

To reduce impacts of Natural Hazards and accidental hazard BTSM has taken the following actions

- ✓ All the infrastructures have been designed and installed to withstand natural hazard
- ✓ The operators at boiler & generator are properly trained
- ✓ Sufficient fire extinguisher available in the project
- ✓ First Aid points are available with trained paramedics
- ✓ Fire alarm & fire training
- ✓ Information center is available at major locations
- ✓ Entering in the danger zone is strictly prohibited
- ✓ Safety instructions and rules are displayed at all machinery
- ✓ Trained supervisors and operators ensure proper implementations of safety rules.

#### **7.2.3.7 Soil Contamination**

### **Impacts and Origin**

Soil contamination may occur due to accidental leakage or spillage of hazardous substances such as lead, lead oxide, and sulfuric acid during handling, storage, or internal transport. Once released into the soil, lead tends to persist for long periods due to its non-biodegradable nature and strong binding with soil particles. This can lead to long-term degradation of soil quality and potential uptake by plants, entering the food chain.

In severe cases, such contamination may become practically irreversible without costly remediation.

### **Mitigation Measures**

- Impermeable flooring in all hazardous zones
- Secondary containment for chemical storage
- Immediate spill response system
- Proper training for handling hazardous materials
- Regular inspection and maintenance

#### **7.2.3.7 Groundwater Contamination**

##### **Impacts and Origin**

Groundwater may be impacted through infiltration of contaminated wastewater, leakage from storage systems, or seepage from waste disposal areas. Since groundwater systems are slow to recharge and dilute pollutants, even small continuous leakage can lead to long-term accumulation of contaminants such as heavy metals and acidic compounds. This may affect nearby tube wells and water supply sources.

Although some dilution and natural attenuation may occur, recovery of groundwater quality is typically slow.

##### **Mitigation Measures**

- Properly designed and operated ETP
- Lined drainage and storage areas
- Leak-proof chemical handling systems
- Routine groundwater monitoring
- Zero leakage policy implementation

### **7.3 Anticipated Positive Impacts of the Project**

The proposed project is expected to generate several positive impacts, contributing to economic and social development. These are outlined as follows:

- ✓ Creation of jobs;
- ✓ Support of local businesses;
- ✓ Infrastructure development;
- ✓ Revenue to Local Municipal Council; and
- ✓ Gains to the economy.

### ***7.3.1 Job Opportunities***

Construction sites are a major source of employment opportunities. The project will create both direct and indirect jobs throughout its lifecycle. This includes temporary employment during the construction phase and permanent positions during operation. The new jobs will increase household income and improve the standard of living for local residents.

### ***7.3.2 Support of Local Businesses***

The proposed project often requires the services of different expertise. This includes contractors and consultants who will be hired to work in different sections of the project. Transporters, suppliers and other services providers have new business opportunity opening as a result of the project. Thus, the entire project will contribute to support of local businesses.

### ***7.3.3 Infrastructure Development***

Local infrastructure like storm water drainage, parking spaces, pedestrian walkways within and, telephone, water pipeline, and electricity connectivity has been developed. Corporate social responsibility programs implemented project authority may also lead to development of social amenities within the Area.

### ***7.3.4 Revenue to Local Municipal Council***

The project will generate significant revenue for the local municipal council through various taxes and fees, including property taxes, business licenses, and other levies. This new revenue stream can be used to fund public services, such as schools, healthcare facilities, and sanitation, directly improving the quality of life for the community.

### ***7.3.5 Gains to the Economy***

There will be gains to the economy due to the future construction or development in the project area. On a broader scale, the project will contribute to the national economy. It will add to the country's Gross Domestic Product (GDP), attract foreign investment, and reduce the need for imported goods, thereby improving the balance of trade. The project's success will serve as a model for further industrial growth.

## **CHAPTER 08**

# **ENVIRONMENTAL MANAGEMENT PLAN**

## **8. ENVIRONMENTAL MANAGEMENT PLAN**

### **8.1 General Consideration**

To control a project, Environmental Management Plan (EMP) is concerned with the implementation of the measures necessary to minimize or offset adverse impacts and to enhance beneficial impacts. Unless the mitigation and benefit enhancement measures, identified in IEE or EIA cannot be achieved. All the measures are said to be successful when they comply with the Environmental Quality Standard (EQS) of Bangladesh. Thus, the objectives of EMP for the present project would be:

- ✓ Mitigation measures to reduce or eliminate negative impacts;
- ✓ Enhancement measures to maximize positive impacts;
- ✓ Monitoring requirement and indicators.

### **8.2 Environmental Management System**

Identification and summary of all potentially significant adverse environmental impacts from the company's manufacturing activities; List of specific measures to be undertaken to mitigate environmental impacts; Description and technical details for each mitigation measure, including the type of impact to which it relates and the conditions under which the measure is required, as well as equipment descriptions and operating procedures; Institutional arrangements, including assignment of responsibilities for implementing mitigation measures (i.e. supervision, enforcement, monitoring of implementation, remedial action, reporting, and staff training).

### **8.3 Phase Specific Management Plan for the Project**

The Environmental Management Plan (EMP) for the proposed development of Kishan Accumulators Ltd. has been structured on a phase-specific basis to ensure effective identification, control, and monitoring of environmental impacts throughout the project lifecycle. Considering the distinct nature of activities and associated environmental risks, the management plan has been divided into three key phases: pre-construction (planning and site preparation), construction, and operation.

Each phase presents different types and intensities of environmental interactions. Therefore, tailored mitigation and monitoring strategies are required to ensure that potential adverse impacts are minimized at their source and managed in a systematic manner. The phase-specific approach also facilitates better allocation of responsibilities, resources, and compliance mechanisms, ensuring environmental safeguards are effectively implemented at each stage of development.

During the pre-construction phase, emphasis is placed on proper site planning, land preparation, and integration of environmental considerations into design and layout decisions, including drainage planning and buffer zone establishment. The construction phase focuses on controlling temporary impacts such as dust generation, noise, soil erosion, occupational safety risks, and construction waste management through contractor-level environmental controls. The operation phase addresses long-term environmental aspects such as air emissions, wastewater management, hazardous waste handling, noise control, groundwater protection, and occupational health and safety.

This phase-wise classification ensures that environmental protection measures are not treated as standalone actions but are integrated into each stage of project implementation. It further supports proactive environmental management, reduces the likelihood of cumulative impacts, and promotes compliance with national environmental regulations and good international industrial practices.

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

*Table 8.1: Pre- Construction Phase Management Plan of the Project*

| <b>Pre-Construction Phase Management Plan of the Project</b> | <b>Environmental Aspect</b>        | <b>Potential Impact</b>                                                                                                                       | <b>Management / Mitigation Measures</b>                                                                                                                                                                                                            | <b>Monitoring Requirements</b>                                                        | <b>Responsible Party</b> |
|--------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------|
|                                                              | <b>Disruption of Earth Surface</b> | Alteration of natural land profile due to construction, cutting, and filling activities which may affect drainage patterns and soil stability | Major cutting and filling of earth should be avoided or minimized as far as practicable; maintain existing natural land contours; develop proper site grading plan; construct adequate stormwater drainage system to ensure natural flow of runoff | Site inspection during construction and post-construction drainage performance review | Factory Authority        |
|                                                              | <b>Groundwater Depletion</b>       | Excessive abstraction of groundwater for construction and operational use may lower groundwater table and affect local availability           | Use water-efficient technologies; promote recycling and reuse of treated wastewater; implement water conservation measures; develop groundwater monitoring program for sustainable abstraction                                                     | Periodic groundwater level monitoring and water consumption record review             | Factory Authority        |
|                                                              | <b>Inadequacy of Buffer Zone</b>   | Insufficient vegetative buffer may increase exposure of surrounding environment to dust, noise, and emissions                                 | Develop greenbelt around the project boundary; plantation of native tree species in all available open spaces; maintain buffer zone as per regulatory requirements; ensure long-term maintenance of plantation                                     | Regular inspection of greenbelt development and survival rate of plantation           | Factory Authority        |

*Table 8.2: Construction Phase Management Plan of the Project*

| <b>Construction Phase Management Plan of the Project</b> | <b>Environmental Aspect</b>                 | <b>Potential Impact</b>                                                                   | <b>Management / Mitigation Measures</b>                                                                                                             | <b>Monitoring Requirements</b>                                              | <b>Responsible Party</b>                |
|----------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------|
|                                                          | <b>Run-off &amp; Soil Erosion</b>           | Soil erosion and sediment washout from earth filling and site preparation activities      | Proper compaction after each layer of earth filling; avoid earth filling during rainy season; proper site leveling and drainage management          | Regular site inspection during earthworks, especially after rainfall events | Factory Authority                       |
|                                                          | <b>Worker Safety / Accidents</b>            | Injury or accidents due to construction activities, machinery operation, and site hazards | Install warning signs and safety signals; provide PPE (helmets, gloves, boots); restrict unauthorized access; follow standard safety procedures     | Daily safety inspection and accident reporting system                       | Factory Authority / Site Safety Officer |
|                                                          | <b>Sanitation &amp; Public Health Risks</b> | Spread of waterborne and communicable diseases among workers due to poor sanitation       | Provide safe drinking water; construct adequate sanitary and toilet facilities; conduct regular health check-ups; promote health awareness programs | Weekly inspection of sanitation facilities and worker health records        | Factory Authority / Site Supervisor     |
|                                                          | <b>Noise and Vibration</b>                  | Disturbance to workers and nearby receptors due to construction machinery and activities  | Schedule construction activities considering local sensitivity; maintain equipment to reduce noise; limit high-noise activities to daytime          | Periodic noise level monitoring during peak construction activity           | Factory Authority / Site Supervisor     |
|                                                          | <b>Air Pollution (Dust Emission)</b>        | Dust generation from earthworks, material handling, and vehicle                           | Regular water sprinkling on dusty surfaces; covering of construction materials; proper                                                              | Visual monitoring and periodic ambient dust assessment                      | Factory Authority / Site Supervisor     |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|  |                              |                                                                                    |                                                                                                                     |                                                    |                                     |
|--|------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------|
|  |                              | movement                                                                           | stockpile management; vehicle speed control on-site                                                                 |                                                    |                                     |
|  | <b>Traffic Congestion</b>    | Disruption of local traffic due to movement of construction materials and vehicles | Avoid transportation of materials during peak traffic hours; proper traffic management plan; use designated routes  | Traffic flow observation during material transport | Factory Authority / Site Supervisor |
|  | <b>Employment Generation</b> | Temporary employment opportunities for local population                            | Prioritize employment of local landless and unskilled labor; ensure fair wage practices and safe working conditions | Employment records and labor audits                | Factory Authority / Site Supervisor |

*Table 8.3: Operation Phase Management Plan of the Project*

| <b>Operation Phase Management Plan of the Project</b> | <b>Environmental Aspect</b>        | <b>Potential Impact</b>                                                                                   | <b>Management / Mitigation Measures</b>                                                                                             | <b>Monitoring Requirements</b>                                                           | <b>Responsible Party</b>                 |
|-------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------|
|                                                       | <b>Air Quality</b>                 | Emission of lead dust, fumes, and particulate matter from casting, mixing, curing, and handling processes | Install LEV systems, use HEPA/bag filters, enclosure of emission sources, vacuum cleaning, PPE use, proper maintenance of machinery | Ambient and workplace air quality monitoring (PM, lead concentration) on quarterly basis | Environmental Officer / Plant Management |
|                                                       | <b>Water &amp; Wastewater</b>      | Contamination from acidic wastewater, suspended solids, and trace metals (lead)                           | Install and operate ETP, segregate wastewater streams, neutralization of effluent, reuse treated water, prevent direct discharge    | Monthly testing of pH, BOD, COD, TSS, and lead concentration                             | ETP Operator / Environmental Officer     |
|                                                       | <b>Noise Pollution</b>             | Continuous noise from machinery (mixers, compressors, cutting machines, etc.)                             | Acoustic enclosures, equipment maintenance, PPE (ear protection), zoning of noisy equipment, worker rotation                        | Noise level monitoring at plant boundary and workplace (quarterly)                       | Safety Officer                           |
|                                                       | <b>Solid &amp; Hazardous Waste</b> | Scrap lead, ETP sludge, plastic waste, rejected batteries                                                 | Waste segregation, safe storage in labeled containers, recycling of lead through authorized recyclers, proper sludge disposal       | Monthly waste inventory and disposal records                                             | Waste Management Officer                 |

*Environmental Impact Assessment (EIA) of Kishan Accumulators Ltd.*

|  |                                               |                                                                             |                                                                                                              |                                                              |                             |
|--|-----------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------|
|  | <b>Soil Contamination</b>                     | Spillage of lead, acid, and hazardous chemicals during handling and storage | Impermeable flooring, secondary containment, spill kits, emergency response training, proper storage systems | Monthly inspection of storage and handling areas             | Safety & Environmental Team |
|  | <b>Groundwater Pollution</b>                  | Leakage/infiltration of contaminated wastewater and chemicals into aquifer  | Proper ETP operation, leak-proof drainage, lined storage areas, zero discharge policy where feasible         | Bi-annual groundwater quality testing from nearby tube wells | Environmental Officer       |
|  | <b>Occupational Health &amp; Safety</b>       | Exposure to lead dust, chemicals, and physical hazards                      | PPE provision, blood lead monitoring, health check-ups, safety training, restricted access zones             | Quarterly health monitoring and incident reporting           | HR & Safety Department      |
|  | <b>Accidental Hazards</b>                     | Fire, explosion, chemical leakage, natural disasters                        | Emergency Response Plan (ERP), fire extinguishers, hydrant system, safety drills, flood protection measures  | Bi-annual emergency drills and incident log review           | Emergency Response Team     |
|  | <b>Employment &amp; Socio-economic Impact</b> | Job creation and income generation                                          | Local hiring priority, skill development training, fair wages, safe working conditions                       | Employment records and HR review (annual)                    | HR Department               |

## **8.4 Other Safety Plan**

### ***8.4.1 Occupational Safety***

The management of Kishan Accumulators Ltd. shall implement a comprehensive occupational health and safety (OHS) policy to ensure a safe working environment for all employees, contractors, and visitors within the project premises. The safety policy will cover all operational activities including handling of machinery, chemical substances, electrical systems, material storage, and movement of heavy loads. Special emphasis will be given to high-risk areas such as lead handling, acid storage, plate casting, and battery assembly sections.

Strict safety protocols shall be enforced for working near operating machinery, including the use of personal protective equipment (PPE), machine guarding, and restricted access to hazardous zones. Safe procedures for stacking, packing, lifting, and transporting materials shall be implemented to prevent occupational injuries. Smoking, eating, and carrying ignition sources such as cigarettes and matches inside production areas shall be strictly prohibited due to the presence of flammable and hazardous materials.

All factory buildings and associated civil structures will be constructed in accordance with approved engineering designs and relevant national building codes to ensure structural safety and durability. Adequate provisions for access roads, clearly marked staircases, emergency exits, and evacuation routes will be maintained throughout the facility. Electrical systems, including wiring, switchboards, and circuit breakers, shall be installed by qualified professionals and regularly inspected to prevent electrical hazards and fire risks.

Regular safety training, toolbox talks, and awareness programs will be conducted to ensure that all workers are familiar with workplace hazards and emergency procedures. Periodic safety audits and inspections will be carried out to ensure continuous compliance with occupational health and safety standards.

### ***8.4.2 Emergency Responses***

The management of Kishan Accumulators Ltd. has incorporated comprehensive emergency response provisions within its safety policy to ensure effective preparedness and rapid response to any accidental situations such as fire, chemical leakage, or industrial hazards. These arrangements are designed to minimize loss of life, property damage, and environmental harm during emergency events.

All areas within the factory premises are equipped with an adequate number of portable fire extinguishers. These extinguishers are strategically placed in easily accessible locations and are clearly marked for quick identification during emergencies. Each fire extinguisher is properly labeled with usage instructions and validity periods, in accordance with the guidelines of the local Fire Service and Civil Defence authority. In addition, fire alarm systems with visual indicators (light alarms) have been installed at appropriate locations throughout the facility to ensure immediate detection and alerting of fire incidents.

Emergency exit routes and fire safety plans are prominently displayed on all production floors to ensure that employees are well informed about evacuation procedures. Entry and exit pathways within the factory have been clearly marked and fitted with emergency lighting systems to facilitate safe evacuation during power failure or low-visibility conditions. Furthermore, dedicated emergency staircases have been provided in addition to regular access stairways to ensure smooth and rapid evacuation during critical situations.

To strengthen emergency preparedness, a dedicated vehicle will be kept on standby at all times for immediate transportation of injured personnel or victims to nearby medical facilities. Regular emergency drills and awareness programs will be conducted to ensure that all workers are familiar with evacuation procedures and emergency response actions.

#### ***8.4.3 Health and Environmental Hygiene***

The factory authority has adopted a “health and environment policy” for ensuring sanitary condition within the factory premises and for providing healthcare support to the factory workers. The policy deals with cleanliness within the factory premises, disposal of solid wastes, maintenance of latrines, urinals, and drains, and lighting of factory premises. Potable water in sufficient volumes is made available to all employees working on every floor. As mentioned earlier, a team of one doctor and two nurses work full-time in the factory to help factory employee with their medical needs.

Health and Environment Policy-

##### **Factory Cleanliness**

The interior of factory is being kept clean. To maintain cleanliness all interior walls are painted with paint. And floor is cc/tiles finished. Apart from that industrial vacuum-cleaning machine is being used on a regular basis for dirt free interior.

### **Disposal of Waste & Effluents**

There is an insignificant quantity of raw material waste and packaging material is being disposed of through local vendor. Usually they (vendor) use packaging materials is being recycled for different uses. The re-cycled (semi full) product is environment friendly.

The factory floor is being kept free of any kind of liquid, and the human waste is being disposed of in toilet, which will be drained to underground soak well.

### **Maintenance of Drains**

Washroom wastewater drains has been constructed properly maintaining required slope, so that nothing can be accumulated in system.

### **Lighting of Interior of Factory**

The factory floor is lightened already with tube light sets. It is designed to keep minimum 600 lux illuminations on top of the Machine.

**Factory floor:** All exit & stairs have been equipped with proper emergency light units.

Production floor is equipped already with sufficient nos. of ceiling fans and industrial exhaust fans for sufficient ventilation and cooling.

### **Drinking Water Provision**

There is sufficient volume of fresh natural drinking water kept at convenient locations of shed. It is our business goal to keep sound health to enhance the productivity.

### **Toilets & Urinal**

There are already constructed a total of separate toilets for male and female workers, which meets the local authority requirements. All the toilets are connected with water line for flushing system to wash down the pan & Commode. Toilet floors and partial walls are tiled for hygienic region. Four times a day, hired cleaners clean the whole area with different liquid cleaner. Exhaust fan has ensured fresh airflow inside the toilets and sufficient lighting has been installed. Human waste and wastewater are eventually drained to the soak well through a septic tank system.

## **Safety Policy-**

### **Safety Precaution**

All machineries & Equipment are designed considering the safety well as per local laws well as international factory safety guidelines.

### **Building and Structure**

Building machines and equipment are well protected to ensure workers safety. Proper safety notice & Instruction in Bi-lingual (Bangle & English) are set to required equipment. Under no circumstances no one will be allowed to use any pains in the factory. There is no machinery or equipment that is un-protected in the factory which may endanger the workers.

### **Staking, Packing and Storing Material**

Factory warehouse is equipped with required pallet to systematic arrangements for staking. There is kept minimum one-meter gap between stacks.

### **Fire Fighting Equipment**

As per floor area sufficient number of different types & size portable fire extinguishers have been placed and defined by special mark and easily located while kin emergency.

Periodically local fire-service & civil defense dept. will inspect the production floor to give the certificate.

All fire extinguishers have been colored as per type, details of usability as mentioned in EU standard notice which has been placed in production floor.

All fire extinguishers have been labeled with effective use period and replace of dry powder, foam at regular interval and label as per recommendation of local civil defense fire service.

Fire alarm with light has been placed in easily visible range and alarm switch has been marked with proper graphic & Symbol notation with wordings.

### **Means of Escapes in Case of Fire & Emergency**

There is a fire/emergency evacuation plan with symbols fixed in easily visible on the place of floor.

### **Prohibition of Smoking**

Smoking is strictly prohibited at any time on any day in the factory.

At each time of entry of a worker, the security people are being engaged at the entry gate are to collect matches & cigarette from workers and deposit in the office.

## **CHAPTER 09**

# **ENVIRONMENTAL MONITORING PLAN**

## **9. ENVIRONMENTAL MONITORING PLAN**

### **9.1 Monitoring Requirement**

Monitoring of the performance of a plant is very important and sometimes vital. An industrial unit in Bangladesh generally monitors the quality of its raw materials and product, but not the related environmental parameters, thereby neglecting the environment. For surveillance of the performance of the equipment and the quality of the environment, monitoring of the environment of the work-zone and the general environment should be performed on a regular basis.

It should be mentioned here that the monitoring program should be such so that it can ensure compliance with national environmental standards. The importance of this monitoring program is also for ensuring that the plant does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be, utilize if unwarranted complaints are made. Environmental Monitoring is an integral part of Environmental Management Plan. It involves systematically tracking environmental conditions to measure a project's impact and ensure compliance with regulations. This continuous process allows for the effective management and adjustment of environmental strategies over time.

### **9.2 Monitoring Indicators**

Environmental monitoring requires set of indicators that could be conveniently measured, assessed and evaluated periodically to observe the trends of change in baseline environmental quality. A list of possible parameters to be tested, sample number and sampling frequency are given in Table 9.1.

*Table 9.1: Monitoring Parameters for Different Components*

| <b>Environmental Component</b>            | <b>Parameters</b>                            | <b>Locations</b> | <b>No. of Sampling per year</b> |
|-------------------------------------------|----------------------------------------------|------------------|---------------------------------|
| <b>Acoustic Environment (If required)</b> | Different Places inside factory in dB unit   | Production Floor | 1                               |
| <b>Air</b>                                | SO <sub>x</sub> , NO <sub>x</sub> , SPM etc. | Production Floor | 2                               |
| <b>ETP Water</b>                          | pH, BOD, COD, TDS, Lead etc.                 | Inlet & Outlet   | 3                               |

### 9.3 Other Monitoring Programs

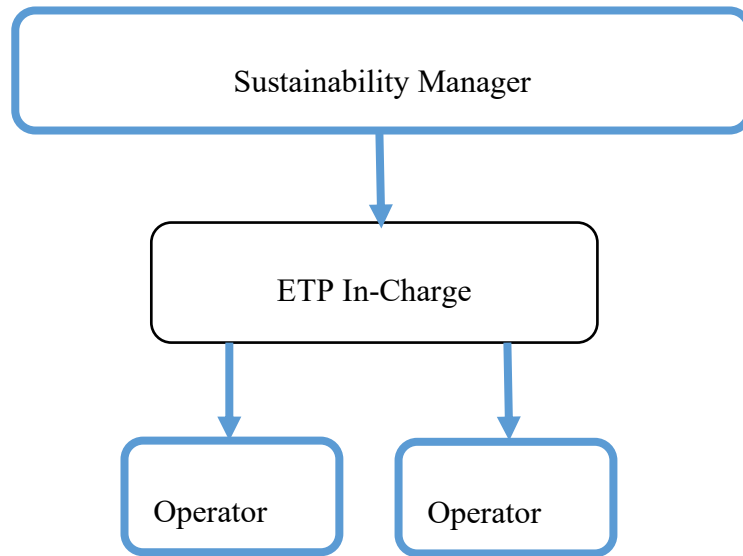
- ✓ Amount of solid waste (e.g., waste, ETP, trimmings, packaging materials, etc.) generated and the method of their disposal (e.g., local vendor, Reuse/Recycle) should be properly recorded.
- ✓ Emergency response facilities, e.g., fire extinguishers, should be regularly checked and their contents refilled at regular interval. Records of such checking and re-filling should be properly maintained.
- ✓ There should be regular drills for factory workers to familiarize them with emergency evacuation procedures.
- ✓ There should be regular training programs for factory employees in order to make them aware about the “safety policy” and “health and environmental hygiene policy” of the factory.

### 9.4 Monitoring Budget

*Table 9.2: Monitoring Budget for Different Parameters*

| Particulars              | Yearly Cost (in BDT.) Including consultancy Fee |
|--------------------------|-------------------------------------------------|
| Air Quality Parameters   | 100000                                          |
| Sound Quality Parameters | 20000                                           |
| Water Quality Parameters | 80000                                           |
| <b>Total</b>             | <b>200000</b>                                   |

## **9.5 Environmental Monitoring Team**



*Figure 9.1: Environmental Monitoring Team*

## **CHAPTER 10**

### **PUBLIC CONSULTATION**

## **10. PUBLIC CONSULTATION**

### **10.1 General Consideration**

Public consultation is an important part of the EIA process to ensure stakeholder participation, transparency, and consideration of local concerns in project planning. For the proposed Lead Acid Starter Battery (LAS) manufacturing project of Kishan Accumulators Ltd. located at Uzirpur, Bokultola, Narail Sadar, Narail, consultations were conducted with nearby residents and stakeholders during site visits.

The consultation process was carried out in accordance with Rule 16 of the Environmental Conservation Rules (ECR), 2023, ensuring proper stakeholder engagement and documentation. Key concerns related to air, noise, wastewater, and occupational safety were discussed, and community feedback was considered in developing mitigation measures under the EMP.

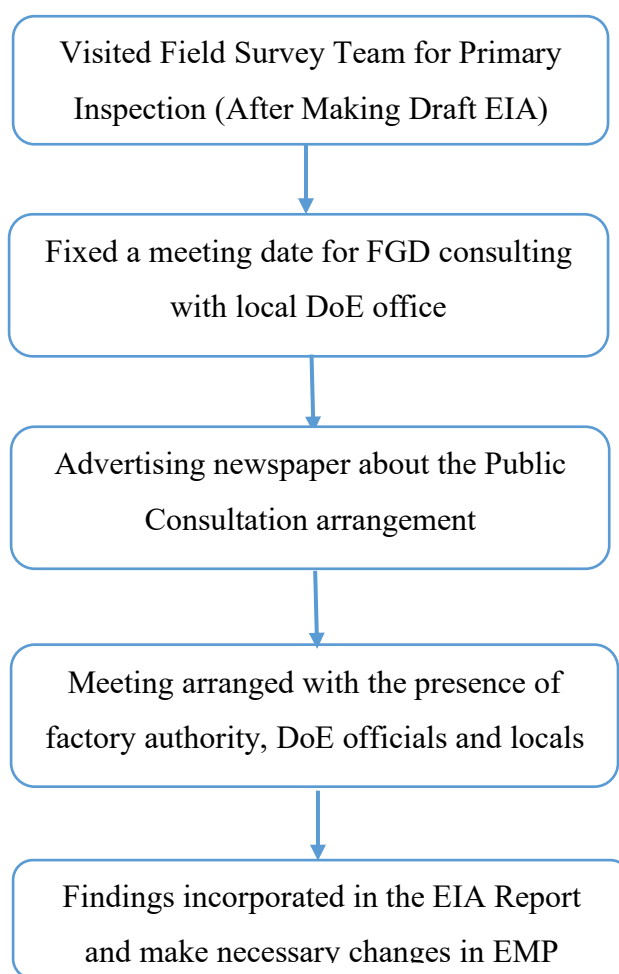
### **10.2 Objectives of the Consultation**

The objectives of the public consultation were to:

- Ascertain public views on environmental and social issues related to the proposed project;
- Identify ways to enhance positive impacts and minimize potential adverse environmental effects;
- Obtain site-specific information and local knowledge to support the formulation of appropriate mitigation measures;
- Reduce the likelihood of social conflicts or grievances related to project activities, if any;
- Incorporate stakeholder feedback into the Environmental Management Plan (EMP) for improvement and updating;
- Share relevant project information with local communities to ensure transparency and awareness.

### 10.3 Methodology

After completion of the EIA study and draft report preparation, the field survey team visited the project site and surrounding areas of Kishan Accumulators Ltd. to collect stakeholder opinions on potential environmental and social impacts, both positive and negative, along with possible mitigation measures. The consultation process aimed to improve the study by incorporating views from local residents, businessmen, and other relevant stakeholders, as well as insights from project officials regarding operational activities and environmental implications. In addition, Focus Group Discussions (FGDs) were conducted in accordance with Rule 16 of the Environmental Conservation Rules (ECR), 2023 to ensure structured stakeholder engagement and regulatory compliance. The feedback obtained was used to refine the Environmental Management Plan (EMP) and strengthen the overall EIA findings. The process followed during public consultation is given below:



*Figure 10.1: Process Flow of Public Consultation*

## 10.4 Important Dates, Venues and Points

- Newspaper Circulation for the Meeting: 09-03-2026
- Meeting Venue: Company Premises
- Meeting Arranged: 12-03-2026
- Meeting Minutes: Annexure- V
- Attendees of the FGD: Annexure- V
- Advertisement: Annexure- V



*Figure 10.2: Circulated Poster for Public Consultation*

## **10.5 Findings of the Meetings**

The public consultation for the proposed Lead Acid Starter Battery manufacturing project of Kishan Accumulators Ltd. was conducted with participation from local stakeholders, community representatives, and government officials. The discussion focused on environmental protection, employment opportunities, pollution control measures, and community development. Overall, the stakeholders expressed a positive attitude toward the project, subject to proper implementation of environmental safeguards.

The key findings from the consultation are summarized below:

- Local stakeholders welcomed the project and expected **socio-economic development and employment opportunities** from its implementation.
- Strong emphasis was given on the need to ensure **environmental protection, particularly air and water pollution control** during project operation.
- Community members requested **priority employment for local people**, especially for unskilled and semi-skilled job categories, including opportunities for women.
- Concern was raised regarding **wastewater and air emissions**, and stakeholders stressed the importance of installing proper treatment systems.
- The project authority confirmed commitment to environmental protection, including **installation of Effluent Treatment Plant (ETP)** for wastewater treatment.
- Installation of an **Air Pollution Treatment System (ATP)** was recommended to control emissions and reduce air pollution impacts.
- Proper **solid waste management practices** were suggested in accordance with national waste management regulations, including safe collection, storage, transport, and disposal.
- Stakeholders recommended **wastewater reuse after treatment** to reduce environmental stress and promote water conservation.
- Noise control measures such as **equipment enclosure (canopy), thick boundary walls, and buffer greenbelt development** were suggested to minimize noise pollution impacts.

- The project authority assured that **local employment will be prioritized**, including opportunities for women based on eligibility.
- The consultant team explained key mitigation measures including **ETP, ATP, noise control systems, and buffer zone plantation** to ensure environmental compliance.
- The Department of Environment representative confirmed that no formal objections were raised, and the project will remain open for public comments as per regulatory requirements.

## **10.6 Information Disclosure Policy**

The project authority of Kishan Accumulators Ltd. is committed to maintaining transparency and ensuring meaningful engagement with the local community. It will prioritize information disclosure by providing clear, timely, and accessible updates regarding project activities, ensuring that local residents are well-informed and able to participate effectively in the decision-making process.

**Some Visuals of the Meeting**







*Figure 10.3: Picture A, B, C, D, E, and F depicts the public consultant meeting of the Project*

**CHAPTER 11**

**EMERGENCY RESPONSE &  
DISASTER MANAGEMENT PLAN**

## **11. EMERGENCY RESPONSE & DISASTER MANAGEMENT PLAN**

### **11.1 Emergency Response and Disaster Management Plan**

The initial response to an incident is a critical step in the overall emergency response. Like all other Industries and installations, manufacturing plant must have adequate measures against accidents or incidents to meet the emergency. The purpose of having an Emergency Response Plan (ERP) is to:

- Assist personnel in determining the appropriate response to emergencies.
- Provide personnel with established procedures and guidelines.
- Notify the appropriate Company Emergency Response Team personnel and regulatory/ Govt. agencies.
- Manage public and media relations.
- Notify the next-to-kin of accident victims.
- Promote inter-departmental Communications to ensure a “Companywide” Coordinated emergency response.
- Minimize the effects that disruptive events can have on company operations by reducing recovery times and costs.
- Respond to immediate requirements to safeguard the subtending environment and community.

Generally, the initial response is guided by three priorities Ranked in importance these priorities are:

1. People
2. Property
3. Environment

Emergency Response Procedures will identify who does what and when in the event of an emergency. Responsibility for who is in charge and their coordination of emergency actions shall be identified. Nature of Emergency & Hazardous Situations may be of any or all of the following categories:

### **Emergency**

- ❖ Fire,
- ❖ Explosion,
- ❖ Medical emergency,

### **Natural Disasters**

- ❖ Flood,
- ❖ Earthquake/ cyclone,
- ❖ Storm/ typhoon/ tornados, and
- ❖ Cloud burst lightning.

### **External Factors**

- ❖ Food poisoning/water poisoning,
- ❖ Sabotage, and
- ❖ War.

## **11.2 Six Steps in Emergency Response**

### **Step-1)**

Determine the potential hazards associated with the incident, substance or circumstances and take appropriate action to identify the type and qualities of dangerous goods involved and any known associated hazards.

- ✓ Determine potential hazards stemming from local conditions such as inclement weather, water bodies etc. and ensure that the initial response team is aware of these conditions.

### **Step-2)**

- ✓ Determine the source/ cause of the event resulting to the emergency and prevent further losses.

### **Step-3)**

- ✓ Conduct an assessment of the incident site for any further information on hazards or remedies.

**Step-4)**

- ✓ Initiate redress procedures.

**Step-5)**

- ✓ Report the incidence its nature cause impact applied redress procedures and any further assistance required etc. to the appropriate company, government and/or land owner.

**Step-6)**

- ✓ Take appropriate steps with respect to hazards to wildlife, other resources and addressing public and media concerns and issues, as applicable. Response priorities are to protect human lives, property and the environment.

### **11.3 Reporting Incidents and Accidents**

All accidents and near-miss incidents shall be investigated to determine what caused the problem and what action is required to prevent a recurrence. Employees required to perform investigations shall be trained in accident investigation techniques. The incident/accident investigation should be a fact-finding exercise rather than faultfinding. The investigations will focus on collection of evidence to find out the “root cause” of the incident. The recommendations of the investigation report are implemented in phases.

### **11.4 Approaches to Emergency Response**

For this project, emergency response systems should be in place to deal with ride accidents, natural calamities fires burn and injuries. There are to be trained emergency response teams, specific contingency plans and incidence specific equipment packages in place to cope with these types emergency. In case of an emergency incident occurred, immediate action must be taken to mitigate the impacts.

In order to minimize the possibility of injury to the responders and others it is important that emergency responders follow a specific sequence of actions.

## **11.5 Disaster Management Plan**

In normal operation of the project, when all environmental protection equipment works according to design specification, then there would be no environmental problems for the present project. Disaster (to certain degree) may occur if the environmental protection equipment fails to work at normal condition. This situation may arise for any of the following causes-

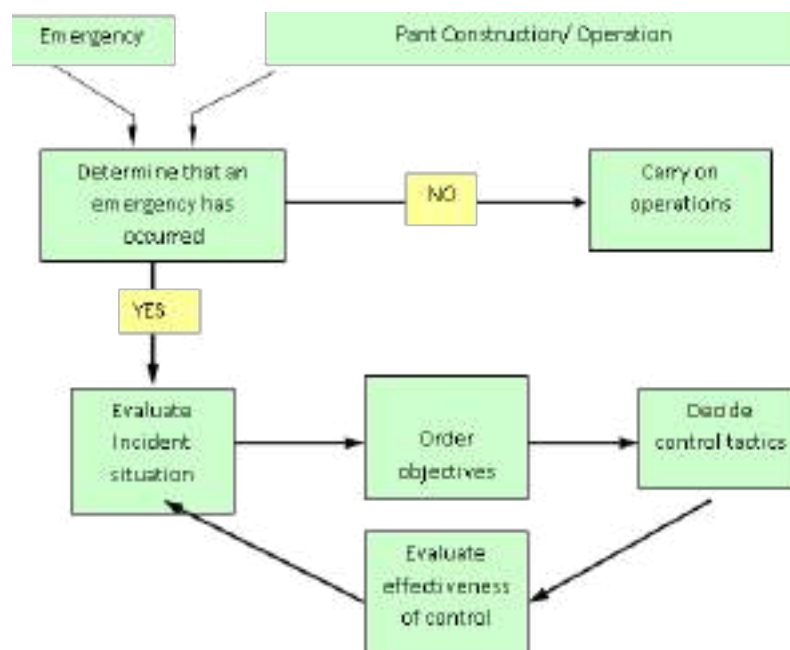
- When project runs at abnormal situation e.g. if the engines give unwanted noise than normal level.
- If liquid waste overflows and pollutes the surroundings

Therefore, appropriate management plan should have to be taken by the project proponent to prevent any unwanted disaster in the project. In this regard there should be a provision to stop the affected/whole facility immediately during any process failure as discussed above.

The disaster management plan should consist of preventive measures including, among others, the following.

- Formulation and strict implementation of safety codes and measures;
- Preventive maintenance;
- Aware the workers about electric shock
- Declaring the project area, a “no smoking zone”
- Mock drills by the firefighting cells/ groups
- Provision and inspection of firefighting equipment and fire hydrant system in all the sections;
- Proper training of the employees about the importance of codes;

- Training the employees and the residents of the surrounding about the actions to be taken during an accident, disaster etc.



*Figure 11.1: Illustrates an Example of Emergency Management Approach to Plant Construction*

It is imperative to develop entire facility environment policy and display necessary documentation for ease in accessing information. Some of these documents include:

- ✓ Emergency contacts;
- ✓ Emergency response procedures for fires

The facilities operations and monitoring are carried out under the management and help from both the employees and relevant government lead agencies. In order to take care of any hazards the following control should be adopted:

All safety precautions and provisions covering the general cleanliness of the entire facility down to, ventilation, lighting, sanitary, waste collection, first aid box provision, adequate fire extinguishers and site security by fencing.

## **CHAPTER 12**

# **FINDINGS & RECOMMENDATIONS**

## **12. FINDINGS & RECOMMENDATIONS**

### **12.1 Findings of the Study**

Based on the available project information and the environmental reconnaissance survey conducted within and around the project area, it is observed that the proposed Lead Acid Starter Battery (LAS) manufacturing facility of Kishan Accumulators Ltd. is not expected to cause any significant adverse environmental impacts, provided that the recommended mitigation measures and environmental management practices are properly implemented during both construction and operation phases.

The Environmental Impact Assessment (EIA) findings indicate that most of the anticipated impacts are localized, manageable, and largely reversible in nature. These impacts primarily relate to air emissions, wastewater generation, noise, solid waste handling, and occupational health and safety risks, which are common in battery manufacturing industries. However, none of these impacts are expected to become widespread or irreversible if standard engineering controls and environmental safeguards are strictly followed.

Appropriate mitigation measures have been developed and integrated into the Environmental Management Plan (EMP) to ensure that all potential environmental impacts remain within acceptable limits defined by national environmental standards. With proper implementation of these measures, the residual impacts are expected to be minor to moderate in magnitude and environmentally acceptable.

Furthermore, the project is expected to incorporate improved industrial practices, pollution control technologies, and structured environmental management systems that will help reduce environmental risks over time. In addition, the project will contribute positively to the local socio-economic condition through employment generation and industrial development.

Overall, the EIA concludes that the proposed project can be implemented in an environmentally sustainable manner, and the predicted environmental impacts can be effectively mitigated through the proposed management measures.

## **12.2 Recommendations**

This section presents key recommendations to ensure that the proposed Lead Acid Starter Battery (LAS) manufacturing facility of Kishan Accumulators Ltd. operates in an environmentally sustainable manner with minimal adverse environmental impacts. The recommendations emphasize pollution prevention, resource efficiency, and adoption of cleaner production technologies.

### **1. Water and Wastewater Management**

- Install flow meters and continuous monitoring systems at key points of water use and Effluent Treatment Plant (ETP) operations to ensure real-time monitoring of flow, pH, and pollutant concentrations.
- Implement **Zero Liquid Discharge (ZLD) system approach**, where technically and economically feasible, to ensure that no untreated or partially treated wastewater is discharged into the environment. This includes maximum reuse, recycling, and evaporation or safe disposal of residual sludge.
- Introduce water-efficient machinery and optimized cleaning systems to minimize freshwater consumption at source.
- Develop a **treated water reuse system** for non-critical applications such as floor washing, cooling, and utility purposes, thereby reducing freshwater demand and wastewater generation.

### **2. Air Quality and Emission Control**

- Implement proper traffic management planning to reduce congestion, idling time, and vehicular emissions within and around the project site.
- Ensure adequate stack height (minimum 30 meters where applicable) for emission dispersion systems to minimize ground-level pollutant concentration.
- Install an **Air Pollution Treatment Plant (ATP)** comprising **wet scrubber systems and dust collection units** at critical emission sources such as lead oxide handling, mixing, casting, and pasting sections to effectively control particulate matter and lead dust emissions.
- Maintain strict control of fugitive emissions from lead handling, casting, and mixing operations through engineering controls such as enclosure systems, local exhaust ventilation (LEV), and regular maintenance of dust control equipment.

### **3. Solid Waste and Hazardous Waste Management (3R Strategy)**

- Implement a **3R (Reduce, Reuse, Recycle) waste management strategy** across all production stages to minimize waste generation and maximize resource recovery.
- Develop strict waste segregation at source, separating hazardous waste (lead scrap, sludge), recyclable materials (plastics, metals), and general waste.
- Promote recycling and recovery of lead-bearing materials through authorized recyclers to ensure resource efficiency and environmental protection.
- Manage ETP sludge and hazardous residues in compliance with national hazardous waste management guidelines, ensuring safe storage, transport, and final disposal.

### **4. Social and Community Engagement**

- Establish a formal Community Grievance Redress Mechanism (CGRM) to address environmental and social concerns raised by local residents in a transparent and timely manner.
- Ensure all complaints are properly recorded, investigated, and resolved to maintain positive community relations and social acceptance of the project.

### **5. Energy and Resource Efficiency**

- Conduct a detailed energy audit prior to full-scale operation to identify energy-saving opportunities in lighting, machinery, and process systems.
- Promote the use of energy-efficient equipment and best available technologies to reduce operational energy consumption.
- Explore and implement **solar energy systems (e.g., rooftop solar PV panels)** to partially offset electricity demand, particularly for non-production loads such as lighting, administration, and auxiliary systems, thereby reducing carbon emissions and operational costs.

## 13. CONCLUSION

### 13.1 Overall Assessment of Environmental Impacts

The proposed project of Kishan Accumulators Ltd. is a Lead Acid Starter Battery (LAS) manufacturing facility located at Uzirpur, Bokultola, Narail Sadar, Narail. The project will involve modern battery production technologies including lead casting, oxide preparation, plate pasting, curing, assembly, testing, and final packaging. The planned production capacity is 1300 units per month, utilizing raw materials such as lead, lead oxide, sulfuric acid, plastic components, and related accessories.

This Environmental Impact Assessment (EIA) has been prepared in accordance with the guidelines of the Department of Environment (DoE), Bangladesh, under the provisions of the Environmental Conservation Act (ECA), 1995 and Environmental Conservation Rules (ECR), 2023. The study involved literature review, field observation, stakeholder interaction, and technical assessment of potential environmental and socio-economic impacts.

The assessment identifies that most of the anticipated environmental impacts are localized, manageable, and reversible in nature, particularly those related to air emissions, wastewater generation, noise, solid waste, and occupational health risks. No significant irreversible or widespread environmental degradation is expected, provided that the recommended mitigation measures and Environmental Management Plan (EMP) are strictly implemented.

The project is also expected to generate positive socio-economic impacts through employment creation, skill development, and increased local economic activity. As an industrial development project on previously available land, it contributes to regional industrial growth without causing large-scale displacement or land-use conflicts.

### 13.2 Effectiveness of Proposed Mitigation Measures

A comprehensive Environmental Management Plan (EMP) has been developed to address key environmental concerns associated with the project. The major mitigation strategies include:

#### **Air Quality Management:**

Installation of Air Pollution Treatment systems including **wet scrubbers, dust collectors, and local exhaust ventilation (LEV)** at critical emission sources such as lead handling,

casting, mixing, and pasting sections. These systems will effectively control particulate matter and lead fumes, ensuring compliance with national air quality standards.

**Water and Wastewater Management:**

A properly designed Effluent Treatment Plant (ETP) will be installed to treat all industrial wastewater containing acidic and metal components. The system will support **Zero Liquid Discharge (ZLD) principles where feasible**, with maximum reuse of treated water for non-critical purposes, thereby minimizing environmental discharge.

**Noise Control:**

Noise impacts will be mitigated through equipment maintenance, acoustic enclosures, PPE use, and controlled working procedures. The impact is expected to remain within acceptable occupational limits.

**Solid and Hazardous Waste Management:**

A structured **3R (Reduce, Reuse, Recycle) strategy** will be implemented for all waste streams. Lead scrap, sludge, and defective batteries will be properly stored and sent to authorized recyclers to ensure safe recovery and disposal.

**Occupational Health and Safety:**

A strong OHS system including PPE use, safety training, emergency preparedness, and health monitoring (including blood lead level checks) will be implemented to protect workers from chemical and industrial hazards.

**Emergency Management:**

Fire safety systems, emergency response planning, and regular drills will ensure preparedness for accidental risks such as fire, leakage, or equipment failure.

### **13.3 Alignment with Regulatory and Sustainability Objectives**

The project has been designed in compliance with the Environmental Conservation Act (ECA), 1995 and Environmental Conservation Rules (ECR), 2023 of Bangladesh, as well as relevant guidelines of the Department of Environment (DoE). It also aligns with national objectives for industrial development, import substitution, and sustainable manufacturing practices. The incorporation of modern pollution control technologies, ZLD principles, 3R waste management approach, and solar energy integration for auxiliary power use reflects the project's commitment to sustainable industrial development and environmental stewardship.

### **13.4 Final Recommendation**

Considering Based on the findings of this Environmental Impact Assessment, it is concluded that the proposed Lead Acid Starter Battery manufacturing project of Kishan Accumulators Ltd. is environmentally feasible and can be implemented in a sustainable manner.

Although certain environmental impacts are anticipated during both construction and operational phases, these impacts are largely manageable, localized, and reversible when appropriate mitigation measures are implemented effectively. The proposed Environmental Management and Monitoring Plan (EMP) provides a strong framework for minimizing environmental risks and ensuring regulatory compliance.

Therefore, it is recommended that the Department of Environment (DoE) consider granting the necessary Environmental Impact Assessment (EIA) approval, Site Clearance, and Environmental Clearance Certificate (ECC) for the establishment and operation of the proposed project at Uzirpur, Bokultola, Narail Sadar, Narail.

## **CHAPTER 14**

## **REFERENCES**

## 14. REFERENCES

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## **Annexures**

| <b><i>Component</i></b> | <b><i>Details</i></b>                                                              |
|-------------------------|------------------------------------------------------------------------------------|
| <b>Annexure-I</b>       | Approved ToR, Production Process Flow, List of Machineries & Project Layout Plan   |
| <b>Annexure- II</b>     | Baseline Air, Water and Noise Test Results                                         |
| <b>Annexure- III</b>    | Newspaper Advertisement, Public Consultation Meeting Minutes, Attendees of the FGD |
| <b>Annexure- IV</b>     | ETP Drawing & Design                                                               |
| <b>Annexure-V</b>       | Air Pollution Control System (APCS) Design                                         |

**Annexure I**

***Approved ToR, Production Process Flow, List  
of Machineries & Project Layout Plan***

Government of the People's Republic of Bangladesh  
Department of Environment  
Head Office  
Poribesh Bhaban, E-16, Agargaon  
Sher-E-Bangla Nagar, Dhaka-1207  
www.doe.gov.bd

Record No: 22.02.4065.307.072.001.25.1

Date: 26/02/2026

**Subject: Approval of Terms of Reference (ToR) for the EIA of the Kishan Accumulators Limited, Uzirpara, Bakultala, Narail Sadar, Narail**

Ref. Your application received on 25.01.2026

With reference to the subject mentioned above, the Department of Environment hereby gives approval of the Terms of Reference (ToR) for Environmental Impact Assessment (EIA) of **Kishan Accumulators Limited, Uzirpara, Bakultala, Narail Sadar, Narail** subject to fulfilling the following terms and conditions:

- A. The project authority shall conduct a comprehensive Environmental Impact Assessment (EIA) considering the overall activity of the said project in accordance with the ToR submitted to the Department of Environment (DoE). The EIA study shall be conducted as per the provisions laid down in the Environmental Conservation Rules, 2023.
- B. The EIA report shall be prepared in accordance with the guidelines provided in Schedule-11 and Rules-15, 16 of the ECR, 2023.
- C. Multidisciplinary experts are required in the study team to prepare the EIA report.
- D. Consultation with Stakeholders/Public Consultation should be done in accordance with Rule 16 of the Environmental Conservation Rules, 2023.
- E. Hence, the Department of Environment issues additional ToR to include in the EIA as follows:

**1. Environmental and Social Baseline information should include:**

- 1.1 Project site-specific micro-meteorological data including temperature, humidity, wind speed & direction and rainfall;
- 1.2 Surface water quality of the nearby river (100 meters upstream and downstream of the discharge point) and other surface drains at 8 locations;
- 1.3 Noise level monitoring at 8 (eight) locations within the study area.
- 1.4 Detailed description of flora and fauna existing in the study area with special reference to rare, endemic and endangered species.
- 1.5 Socio-economic status of the study area.
- 1.6 Methodology for Data Collection:
  - (a) One season (non-monsoon) baseline survey will be carried out for data collection
  - (b) Sampling locations will be indicated on the location map
  - (c) The testing methods and instruments to be used shall be clearly specified

2. Anticipated Environmental and Social Impacts due to the project shall be identified and assessed for their magnitude:
- 2.1 Water Quality (Surface & ground water)
  - 2.2 Hazardous waste
  - 2.3 Noise
  - 2.4 Offensive Odor
  - 2.5 Flora and fauna
  - 2.6 Livelihoods, community health and safety, vulnerable groups and gender issues
3. Production Process, Pollution Source, Environmental Mitigation, Management and Monitoring Plan shall include:
- 3.1 Detailed description of the complete Lead Acid Battery manufacturing process, including raw material handling (lead ingot, lead oxide, sulphuric acid, separators, etc.), paste preparation, grid casting, plate curing, assembly, acid filling, formation, finishing, and recycling operations. The process flow diagram shall clearly indicate a closed production system and identify all potential source points of pollution load (air emissions, wastewater generation, solid and hazardous waste).
  - 3.2 Comprehensive list of plant and machinery/equipment used in each manufacturing unit (e.g., lead melting furnace, oxide mill, paste mixer, curing chamber, formation tanks, acid storage tanks, battery assembly line, recycling unit, etc.) along with a detailed layout plan showing individual unit, pollution control devices, material flow, and designated hazardous waste storage areas.
  - 3.3 Detailed description of the Air Pollution Control Systems (APCS) installed, such as bag filters, cartridge filters, wet scrubbers, mist eliminators, and fume extraction systems, specifically designed to control lead dust, lead fumes, and acid mist. The system shall ensure that no emission of lead/lead fumes/acid fumes escapes into the ambient air and complies with applicable emission standards. Monitoring and maintenance protocols shall also be described.
  - 3.4 Installation of a continuous SO<sub>2</sub> monitoring system inside the plant, particularly in lead melting, refining, and formation areas, with provisions for real-time monitoring, alarm systems, data logging, and compliance reporting to the DoE.
  - 3.5 Detailed plan for treatment of wastewater generated from various plant operations (formation process, washing, floor cleaning, scrubber blowdown, etc.), including collection, segregation, neutralization, heavy metal removal, and treatment through an Effluent Treatment Plant (ETP). Provisions for recycling and reuse of treated wastewater within the plant shall be described. Facilities for safe handling, treatment, and reuse/recycling of lead-bearing sludge (Pb sludge) for authorized purposes must be included.
  - 3.6 Treatment of wastewater from different plant operations, the recycling and reuse of wastewater, Pb sludge reuse facilities for different purposes shall be included. In the EIA report, information regarding ETP and STP should be included following Schedule 12 of the Environmental Conservation Rules, 2023.

4. **The Occupational Health and Safety Plan should include:**
- 4.1 A comprehensive assessment detailing workers' exposure to specific occupational health and safety hazards associated with lead-acid battery manufacturing, including chemical, physical, and ergonomic risks.
  - 4.2 A clearly defined plan, supported by adequate budget allocation, outlining the measures, resources, and responsibilities necessary to ensure the occupational health and safety of all employees.
  - 4.3 An annual health status report of all workers, with particular emphasis on occupational health indicators, exposure monitoring results, and OHS-related medical surveillance findings.
- F. As per Rule 16 of the ECR'23, a soft copy of the draft EIA report shall be sent to the DoE (mimshameem@gmail.com and nrahmanasif@gmail.com) in order to publish the report on the DoE's website for public comments.
- G. The project authority shall submit the final EIA report to the Head Office of DoE in Dhaka.
- H. Without approval of the EIA report by the Department of Environment, the project authority shall not make any land and infrastructure development.



26-02-2026

Masud Iqbal Md Shameem

Director

222218342

direc@doe.gov.bd

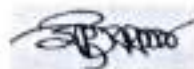
Engr. Md. Kalam Hossain, Managing Director  
Kishan Accumulators Limited, Uzirpara, Bakultala, Narail Sadar, Narail

Record No: 22.02.4065.307.072.001.25.1

Date: 26/02/2026

**A copy for has been sent consideration and necessary (if applicable) action:**

1. Assistant Director, Department of Environment, Narail District Office, Narail



26-02-2026

Masud Iqbal Md Shameem

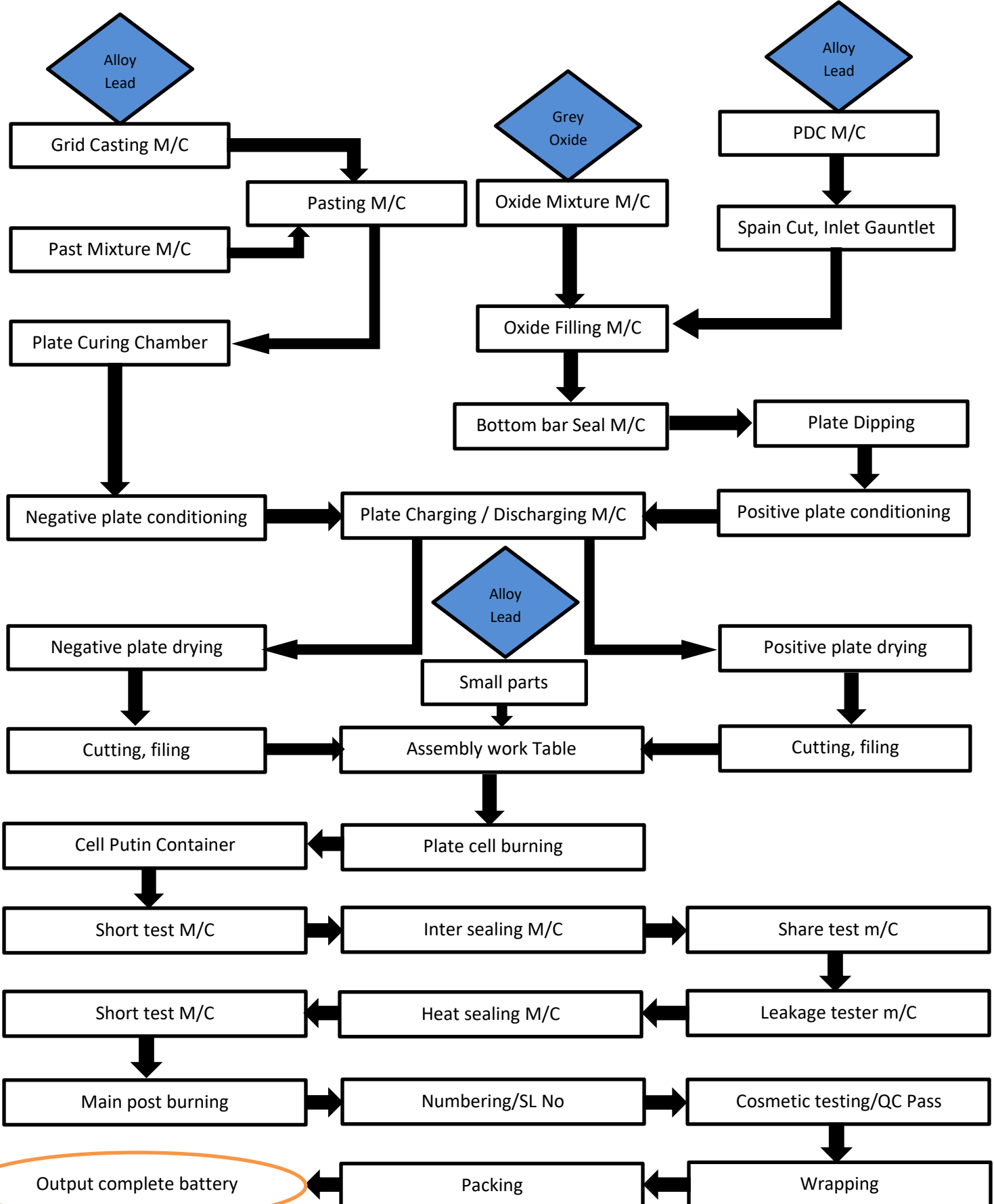
Director

# Kishan Accumulators Ltd

Uzirpur, Bakultola, Narail sadar, narail

Sub: production flow chart template

Date: 31-05-2024

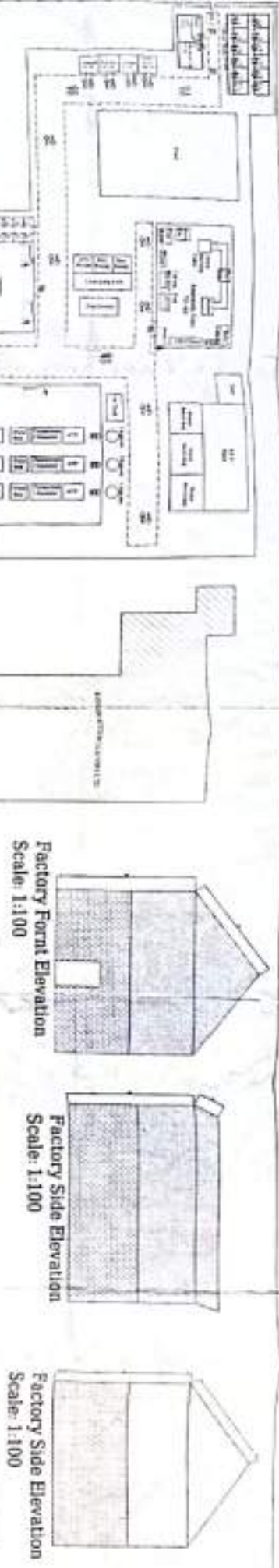


**List of Battery Unit Machineries**

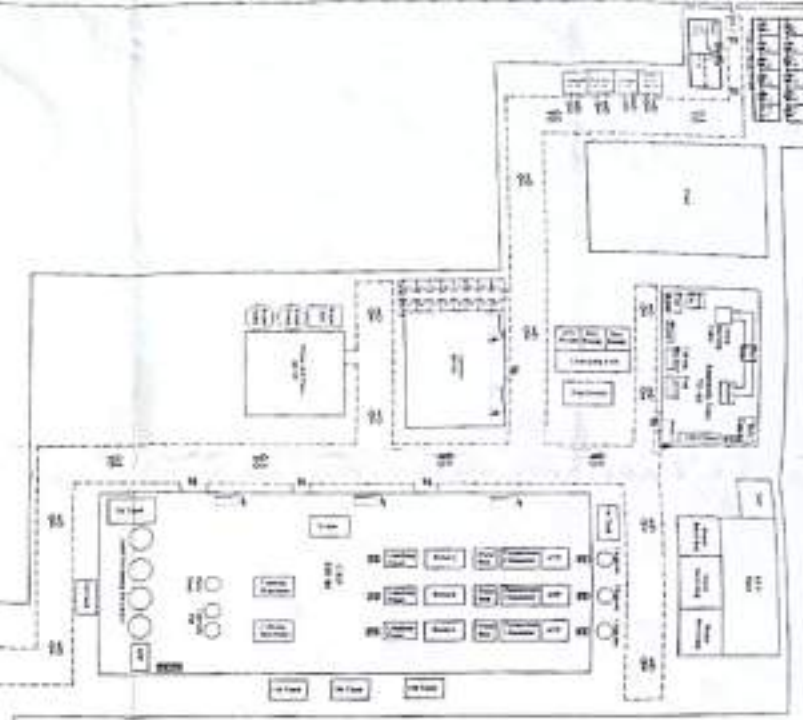
| S/N | Name of Machineries                          | Unit | Quantity |
|-----|----------------------------------------------|------|----------|
| 1   | PDC Grid Casting Machine                     | Set  | 1        |
| 2   | Auto Grid Casting Machine                    | ps   | 1        |
| 3   | Lead Oxide Filling Machine                   | ps   | 1        |
| 4   | Bottom Bar Sealing Machine                   | ps   | 1        |
| 5   | Lead Oxide Mixture Machine                   | ps   | 1        |
| 6   | Pasting Machine                              | ps   | 1        |
| 7   | Paste Mixture Machine                        | ps   | 1        |
| 8   | Flash Drying Oven                            | ps   | 1        |
| 9   | Curing & Drying Chamber                      | ps   | 2        |
| 10  | Plate Charging (Rectifier) Machine           | ps   | 2        |
| 11  | Plate Cutting Machine                        | ps   | 1        |
| 12  | Lug Brushing Machine                         | ps   | 1        |
| 13  | Intercell Welding Machine                    | ps   | 2        |
| 14  | Heat Sealing Machine                         | ps   | 1        |
| 15  | Charging and Discharging Machine             | ps   | 2        |
| 16  | Short-Circuit Machine                        | ps   | 1        |
| 17  | Shere Test Machine                           | ps   | 1        |
| 18  | Leak Test Machine                            | ps   | 1        |
| 19  | Formation Water Bath                         | ps   | 2        |
| 20  | Acid Dilution System with DM Water Equipment | Set  | 1        |
| 21  | Lead Part Mould                              | ps   | 4        |
| 22  | Manual Plate Scarp Welding Mould             | ps   | 10       |
| 23  | Hole Punching Machine                        | ps   | 1        |
| 24  | Heating Cabinet                              | Set  | 2        |
| 25  | Plate Formation Tank with Cassette           | ps   | 200      |

### List of Laboratory Equipment

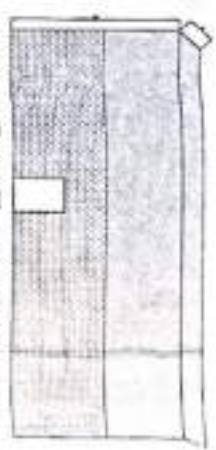
| S/N | Name of Equipment       | Unit | Quantity |
|-----|-------------------------|------|----------|
| 1   | Spectro Lab Machine     | Pcs  | 1        |
| 2   | Molsture Analyzer       | Pcs  | 1        |
| 3   | Weight Scale            | Pcs  | 2        |
| 4   | Argon Gas Cylinder      | Pcs  | 4        |
| 5   | Vertical Drill Machine  | Pcs  | 1        |
| 6   | Hot Plate/Hiter Machine | Pcs  | 1        |
| 7   | Density Weight Scale    | Pcs  | 1        |
| 8   | Bulk Density Machine    | Pcs  | 1        |
| 9   | Tap Density Machine     | Pcs  | 1        |
| 10  | Density Miter           | Pcs  | 2        |
| 11  | Tempature Miter         | Pcs  | 4        |
| 12  | Buret (50ml)            | Pcs  | 1        |
| 13  | Ring Stand              | Pcs  | 1        |
| 14  | Beaker                  | Pcs  | 2        |
| 15  | Funnel                  | Pcs  | 1        |
| 16  | Watch Glass             | Pcs  | 3        |
| 17  | Pipet                   | Pcs  | 2        |
| 18  | Measuring Cylinder      | Pcs  | 2        |
| 19  | Cornical Flask          | Pcs  | 1        |
| 20  | Test Tube               | Pcs  | 2        |
| 21  | Mortar & Pestle         | Pcs  | 1        |
| 22  | Voluometer Flask        | Pcs  | 1        |
| 23  | Storage Bottle          | Pcs  | 5        |
| 24  | Degital Calivers        | Pcs  | 2        |
| 25  | Hydrometer              | Pcs  | 5        |
| 26  | Desiceator              | Pcs  | 1        |
| 27  | Mesh Boulter            | Pcs  | 1        |



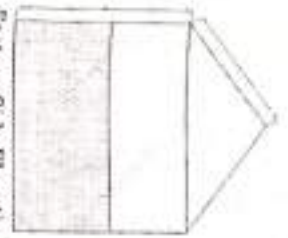
Site Plan For Factory Scale: 1:100



Factory Front Elevation Scale: 1:100



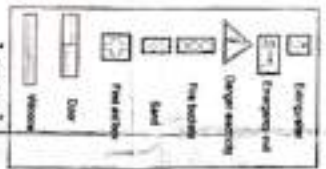
Factory Side Elevation Scale: 1:100



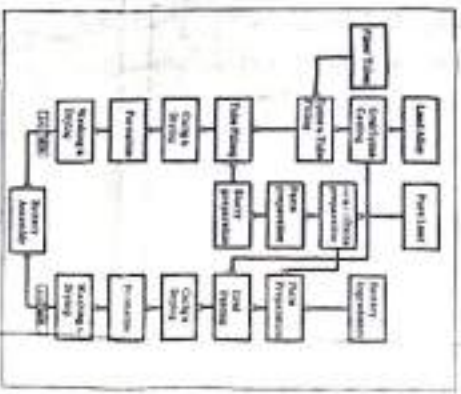
Floor plan For Factory Scale: 1:100



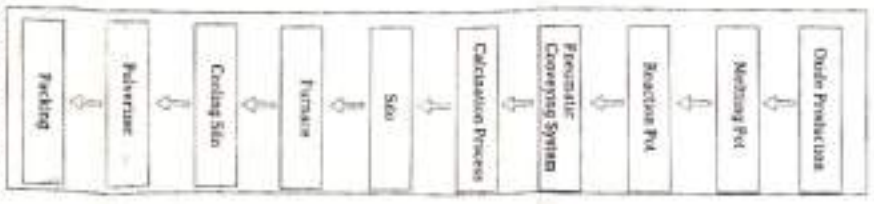
Legend



Production Flowchart (Battery)



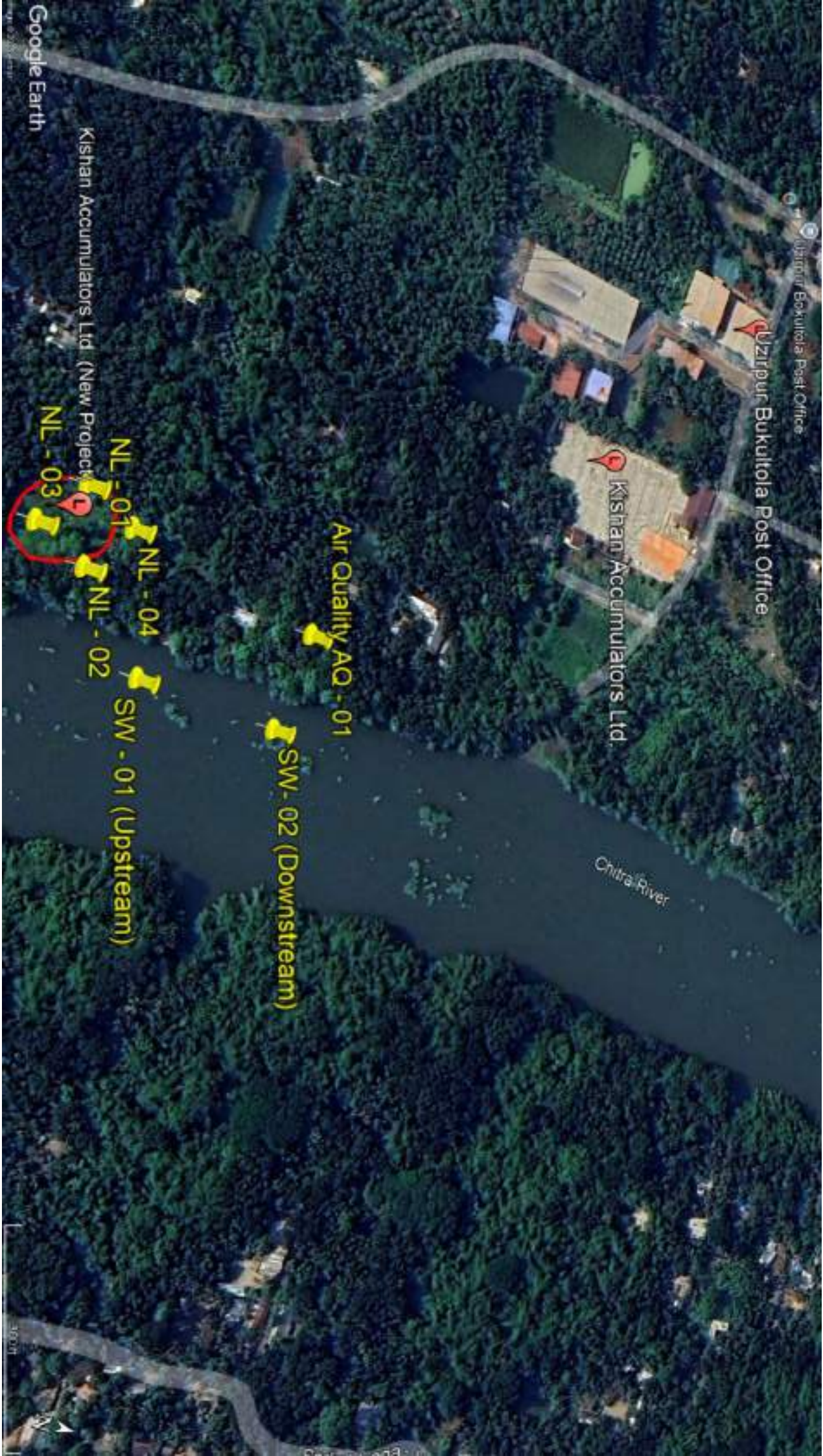
Production Flowchart (Oxide)



|                     |                         |                                    |               |                        |                      |
|---------------------|-------------------------|------------------------------------|---------------|------------------------|----------------------|
| DRAWING TITLE       | PROJECT NAME            | PROJECT LOCATION                   | DRAWN BY      | OWNER NAME & SIGNATURE | ENGINEER'S SIGNATURE |
| MACHINE LAYOUT PLAN | KISHAN ACCUMULATORS LTD | UZBIRPUR, BAKULPURA, SAGAR, NARAIL | Shubham K. S. |                        |                      |

***Annexure II***

***Baseline Air, Water and Noise Test Results***



Uzripur Bukuitola Post Office

Uzripur Bukuitola Post Office

Kishan Accumulators Ltd.

Chitra River

Air Quality AQ - 01

SW - 02 (Downstream)

SW - 01 (Upstream)

NL - 01

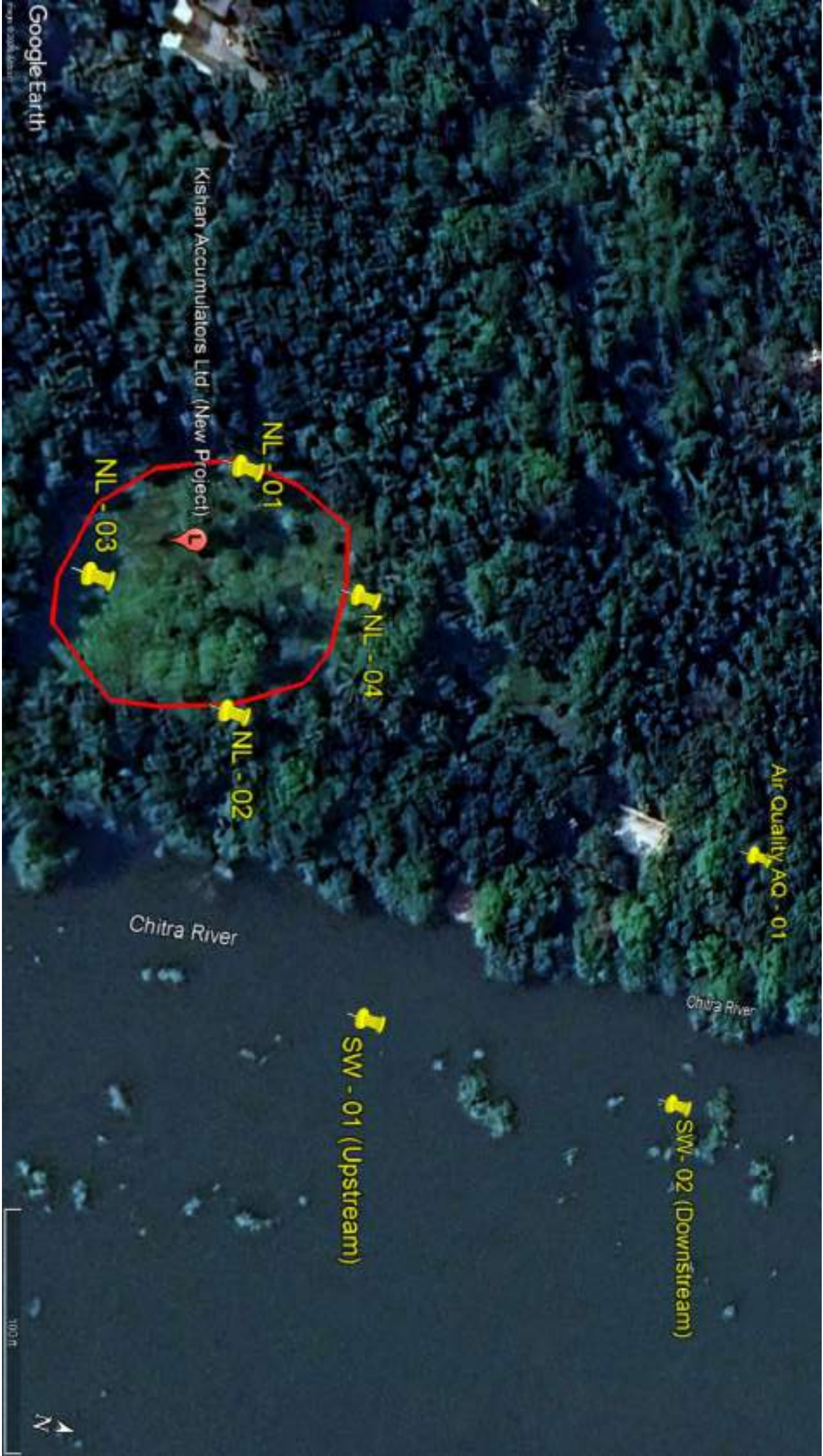
NL - 02

NL - 03

NL - 04

Google Earth

360°



Air Quality AQ - 01

Chitra River

SW - 02 (Downstream)

SW - 01 (Upstream)

Chitra River

NL - 01

NL - 04

NL - 02

NL - 03

Kishan Accumulators Ltd. (New Project)

Google Earth

100 ft





## TEST RESULTS OF AMBIENT AIR QUALITY ANALYSIS

EABDL/Lab Code (TR) : 04\_2026\_0942  
Name of Project : KISHAN ACCUMULATORS LTD.  
Project Address : Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh.  
Description of Sample : Ambient Air Quality Analysis Sample Collected from Project Area  
Sample Collector : Environmental Alliance BD Limited (EABDL Monitoring Team)  
GPS Location : N: 23.128459 & E: 89.520641  
Sampling Date : 26.04.2026  
Date of Analysis : 27.04.2026 – 09.05.2026  
Reporting Date : 09.05.2026

| Sl. No.                                   | Sampling Location & ID                                          | Concentration present different parameter in ambient air |                           |                            |                            |                           |                           |                           |                   |                |
|-------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------|---------------------------|----------------------------|----------------------------|---------------------------|---------------------------|---------------------------|-------------------|----------------|
|                                           |                                                                 | SPM                                                      | SO <sub>2</sub>           | NO <sub>2</sub>            | CO                         | O <sub>3</sub>            | Pb                        | NH <sub>3</sub>           | CO <sub>2</sub>   | O <sub>2</sub> |
| 01                                        | East side of the Project                                        | 46                                                       | 4.1                       | 6.5                        | 0.24                       | 1.2                       | BDL                       | 0.55                      | 217               | 3.1            |
| 02                                        | West side of the Project                                        | 41                                                       | 4.0                       | 6.4                        | 0.25                       | 1.3                       | BDL                       | 0.52                      | 214               | 3.1            |
| 03                                        | North side of the Project<br>In front of Project Main Gate Area | 59                                                       | 4.2                       | 6.8                        | 0.25                       | 1.2                       | BDL                       | 0.53                      | 213               | 3.2            |
| 04                                        | South side of the Project                                       | 51                                                       | 4.3                       | 6.9                        | 0.22                       | 1.1                       | BDL                       | 0.50                      | 204               | 3.0            |
| Unit                                      |                                                                 | µg/m <sup>3</sup>                                        | µg/m <sup>3</sup>         | µg/m <sup>3</sup>          | PPM                        | µg/m <sup>3</sup>         | µg/m <sup>3</sup>         | µg/m <sup>3</sup>         | µg/m <sup>3</sup> | %              |
| Duration (Hour)                           |                                                                 | 24                                                       | 24                        | 24                         | 8                          | 8                         | 24                        | 24                        | 8                 | 8              |
| Method of Analysis                        |                                                                 | Gravimetric                                              | West-Gaeke                | Jacob and Hochheiser       | Electro-Chemical Sensor    | Spectrophotometric Method | AAS                       | Spectrophotometric Method |                   |                |
| Bangladesh (DoE) Standard for Ambient Air |                                                                 | 200                                                      | 80                        | 80                         | 5                          | 100                       | 10                        | 400                       | 10,000            | NYS            |
| IFC/ WB Standard                          |                                                                 | 230<br>(24H) <sup>a</sup>                                | 125<br>(24H) <sup>a</sup> | 40<br>(24H) <sup>a,b</sup> | 7000<br>(24H) <sup>b</sup> | 160<br>(8H) <sup>a</sup>  | 0.5<br>(24H) <sup>a</sup> | NF                        | NF                | NF             |

**Abbreviation:** 1. Suspended Particulate Matter (SPM), 2. Oxides of Nitrogen (NO<sub>x</sub>), 3. Sulphur Di-Oxide (SO<sub>2</sub>), 4. Carbone Mono-Oxide (CO), 5. Ozone (O<sub>3</sub>), 6. Lead (Pb), 7. Ammonia (NH<sub>3</sub>), 8. Carbon di-oxide (CO<sub>2</sub>), 9. Oxygen (O<sub>2</sub>), 10. World Bank (WB) & 11. International Finance Corporation (IFC). 12. Department of Environment (DoE), and 13. Below Detection Limit (BDL).

**\*Standard:** Air pollution Control Rules on 26th July 2022; Vide S.R.O. NO. 255-Law/ 2022 and Environment Conservation Rules (ECR) 1997 through its subsequent amendment on 19<sup>th</sup> July, 2005; vide S.R.O. NO. 220-Law/2005.

**Note:** This ambient air quality monitoring was usually accomplished by the repairable dust sampler PM10 and SPM (Model-AAS-217 AL) and gaseous sampling attachment (LES-Lata Envirotech). The fine particulate air sampler PM2.5 (Model-Lata Envirotech APM 250). All air quality equipment is calibrated by an NABL-accredited lab.

*Aminul Islam*

Inspected & Prepared By:  
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Technical Manager (Environmental  
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*Md. Nazrul Islam*

Reviewed By:  
Md. Nazrul Islam  
M.Sc. and PhD fellow in Chemistry (DU)  
Deputy Quality Manager (Environmental  
Analysis & Development)



*Abubakar Ahamed*

Approved By:  
Md. Abubakar Ahamed  
B.Sc. Engg. (Civil)  
M.Sc. Engg. (Environmental), DUET  
Lead Auditor (ISO14001:2015 & 19011:2018)  
Quality Manager



## LABORATORY ANALYSIS REPORT OF GROUND WATER QUALITY

EABDL/Lab Code (TR) : 04\_2026\_0944  
Name of Project : KISHAN ACCUMULATORS LTD.  
Project Address : Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh.  
Description of Sample : Ground Water Quality Analysis (Source from Deep Tube-Well and Tube-Well)  
Sample Collector : Environmental Alliance BD Limited (EABDL Monitoring Team)  
GPS Location : N: 23.128254 & E: 89.520622 (GW – 01)  
: N: 23.128261 & E: 89.520627 (GW – 02)  
: N: 23.128631 & E: 89.519844 (GW – 03)  
Sampling Date : 26.04.2026  
Date of Analysis : 27.04.2026 – 09.05.2026  
Reporting Date : 09.05.2026

| Sl. No. | Parameters | Unit | Concentrations Present             |                                |                                              | Bangladesh Standard |
|---------|------------|------|------------------------------------|--------------------------------|----------------------------------------------|---------------------|
|         |            |      | GW-01<br>Project Deep<br>Tube-Well | GW-02<br>Project Tube-<br>Well | GW-03<br>Project Outside<br>Area (Tube-Well) |                     |
| 01      | pH         | -    | 7.4                                | 7.5                            | 7.3                                          | 6.5-8.5             |
| 02      | TDS        | mg/L | 231                                | 235                            | 230                                          | 1000                |
| 03      | Iron       | mg/L | 0.42                               | 0.42                           | 0.43                                         | 0.3-1.0             |
| 04      | Alkalinity | mg/L | 149                                | 150                            | 148                                          | --                  |
| 05      | Hardness   | mg/l | 38                                 | 39                             | 37                                           | (200-500) mg/l      |
| 06      | Chloride   | mg/L | 29                                 | 29                             | 29                                           | 250                 |
| 07      | Lead       | mg/L | 0.002                              | 0.002                          | 0.001                                        | 0.01                |
| 08      | Arsenic    | mg/L | 0.004                              | 0.004                          | 0.004                                        | 0.05                |

**Comment:** Comments: The laboratory analyses have been used for the determination of above-mentioned Parameters (pH, TDS, Iron, Alkalinity, Hardness, Chloride, Lead, Arsenic) and buffered calibrated pH meter has been used for determining its value. The ground water quality of the supplied water from Kishan Accumulators Ltd. was good and the values of parameters were within the limit of water quality standard (DOE/EPA). This water might be used as drinking purposes.

Inspected & Prepared By:  
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Quality Manager



## LABORATORY ANALYSIS REPORT OF SURFACE WATER QUALITY

**EABDL/Lab Code (TR)** : 04\_2026\_0945  
**Name of Project** : KISHAN ACCUMULATORS LTD.  
**Project Address** : Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh.  
**Description of Sample** : Surface Water Quality Analysis (Source from Chitra River and pond)  
**Sample Collector** : Environmental Alliance BD Limited (EABDL Monitoring Team)  
**GPS Location** : N: 23.128496 & E: 89.520828 (Upstream)  
 : N: 23.128029 & E: 89.520500 (Downstream)  
 : N: 23.128834 & E: 89.520188 (Pond)  
**Sampling Date** : 26.04.2026  
**Date of Analysis** : 27.04.2026 – 09.05.2026  
**Reporting Date** : 09.05.2026

### Analysis Result:

| Sl. No. | Parameters | Unit | Concentrations in Present |            |                      | DoE (Bangladesh)<br>Standard for Inland<br>Surface Water. |
|---------|------------|------|---------------------------|------------|----------------------|-----------------------------------------------------------|
|         |            |      | Upstream                  | Downstream | Nearby Pond<br>Water |                                                           |
| 01      | pH         | -    | 7.8                       | 7.9        | 8.6                  | 6.0 – 9.0                                                 |
| 02      | TDS        | mg/L | 437                       | 437        | 562                  | 1000                                                      |
| 03      | SS         | mg/L | 11                        | 11         | 27                   | 25                                                        |
| 04      | DO         | mg/L | 4.9                       | 4.9        | 5.6                  | ≥5                                                        |
| 05      | BOD        | mg/L | 3.1                       | 3.1        | 4.7                  | ≤6                                                        |
| 06      | Pb         | mg/L | 0.005                     | 0.005      | 0.03                 | 0.1                                                       |
| 07      | COD        | mg/L | 24                        | 24         | 35                   | 50                                                        |

**Comment:** Appropriate analytical methods have been used for the determination of the above-mentioned parameters of surface water. The physico-chemical parameters of the water were below the standard level of surface water quality set by the DoE, Govt. of Bangladesh.

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 M.Sc. Engg. (Environmental), DUET  
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 Quality Manager



## TEST RESULTS OF AMBIENT NOISE LEVEL ASSESSMENT

EABDL/Lab Code (TR) : 04\_2026\_0943  
Name of Project : KISHAN ACCUMULATORS LTD.  
Project Address : Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh.  
Description of Sample : Ambient Noise Level Assessment. Sample Collected from Project Area  
Sample Collector : Environmental Alliance BD Limited (EABDL Monitoring Team)  
GPS Location : N: 23.127558 & E: 89.520531  
Sampling Date : 26.04.2026  
Date of Analysis : 27.04.2026 – 09.05.2026  
Reporting Date : 09.05.2026

### Assessment Result:

| Sample ID                               | Location Name and GPS Coordinates                        | Concentration Present (dB) |                  |                  |            |                  |                  | Category    |            |
|-----------------------------------------|----------------------------------------------------------|----------------------------|------------------|------------------|------------|------------------|------------------|-------------|------------|
|                                         |                                                          | Day Time                   |                  |                  | Night Time |                  |                  |             |            |
|                                         |                                                          | Leq                        | L <sub>max</sub> | L <sub>min</sub> | Leq        | L <sub>max</sub> | L <sub>min</sub> |             |            |
| NL - 01                                 | East side of the Project<br>N: 23.125780 & E: 89.520388  | 45.77                      | 51.5             | 39.5             | 34.58      | 41.7             | 31.9             | Silent Area |            |
| NL - 02                                 | West side of the Project<br>N: 23.127640 & E: 89.520703  | 44.56                      | 56.5             | 35.4             | 32.83      | 45.7             | 30.2             | Silent Area |            |
| NL - 03                                 | North side of the Project<br>N: 23.127375 & E: 89.520630 | 46.73                      | 51.7             | 38.6             | 34.11      | 37.2             | 31.3             | Silent Area |            |
| NL - 04                                 | South side of the Project<br>N: 23.127720 & E: 89.520434 | 37.40                      | 45.1             | 32.5             | 32.99      | 36.8             | 30.2             | Silent Area |            |
| Bangladesh Standard                     |                                                          |                            |                  |                  |            |                  |                  | Day Time    | Night Time |
| Industrial Area                         |                                                          |                            |                  |                  |            |                  |                  | 75          | 70         |
| Commercial Area                         |                                                          |                            |                  |                  |            |                  |                  | 70          | 60         |
| Mixed Area                              |                                                          |                            |                  |                  |            |                  |                  | 60          | 50         |
| Residential Area                        |                                                          |                            |                  |                  |            |                  |                  | 55          | 45         |
| Silent Area                             |                                                          |                            |                  |                  |            |                  |                  | 50          | 40         |
| World Bank/IFC Standard                 |                                                          |                            |                  |                  |            |                  |                  | Day Time    | Night Time |
| Industrial Area                         |                                                          |                            |                  |                  |            |                  |                  | 70          | 70         |
| Residential; Institutional; Educational |                                                          |                            |                  |                  |            |                  |                  | 55          | 45         |

\*Standard Noise Pollution Control Rules, 2006.

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Quality Manager

***Annexure III***

***Newspaper Advertisement, Public Consultation  
Meeting Minutes, Attendees of the FGD***

## ঢাকায় তিনজনের কারাদণ্ড

### সুবর্ণভূমি ডেক

ঢাকার ধলপুরে শিচুবাগান এলাকায় ২০টি কুকুর হত্যার মায়ে তিনজনকে পৃথক ধারার আড়াই বছর করে কারাদণ্ড দিয়েছে আদালত। রোববার ঢাকার অতিরিক্ত মুখ্য মহানগর হাকিম জাকির হোসাইন এ রায় দেন।

কারাদণ্ডপ্রাপ্তরা হলেন মো. আবুল খাছের, মো. অপু ও মো. মানিক। রায় ঘোষণার সময় দণ্ডিত মানিক আদালতে উপস্থিত ছিলেন। পরে সাজা পরোয়ানা দিয়ে তাকে কারাগারে পাঠানো হয়। অপর দুই আসামি পলাতক থাকার তাদের বিরুদ্ধে জেতারি পরোয়ানা জারি করা হয়েছে।

### মাদক মামলায়

বিদ্যালয়ের মাঠে অভিযান চালায়। পুলিশের উপস্থিতি টের পেয়ে পালাবার সময় ধাওয়া করে তরিকুল ইসলামকে অটক করা হয়, তবে তার সহযোগী ইকবাল পাণিয়ে যেতে সক্ষম হয়। এ সময় তরিকুলের কাছে থাকা ব্যাগ তল্লাশি করে ৭৫ বোতল ফেনসিডিল উদ্ধার করে পুলিশ।

এ ঘটনায় এসআই ইব্রাহিম হোসেন বাণী হয়ে বেনাপোল পোর্ট থানার দুইজনকে আসামি করে মামলা দায়ের করেন। দীর্ঘ সাক্ষাৎপন শেষে তরিকুলের বিরুদ্ধে অভিযোগ প্রমাণিত হওয়ার আদালত তাকে ১০ বছর সশ্রম কারাদণ্ড, ৫ হাজার টাকা জরিমানা এবং অনাদায়ে আরও ৬ মাসের বিনাদায় কারাদণ্ডের আদেশ দেন।

সাজাদাও আসামি তরিকুল ইসলাম বর্তমানে কারাগারে বন্দী রয়েছেন।

৭টার দিকে ফায়ার সার্ভিসের দুটি ইউনিট ঘটনাস্থলে গিয়ে কাজ শুরু করে। প্রায় ৩০ মিনিটের ডেইর আশুন পুরোপুরি নিয়ন্ত্রণে আসে। তিনি আরও জানান, অগ্নিকাণ্ডে কোনো হতাহতের ঘটনা ঘটেনি। প্রাথমিক তদন্তে ধারণা করা হচ্ছে, বৈদ্যুতিক শর্ট সার্কিট থেকে আগুনের সূত্রপাত হয়েছে। ফায়ার সার্ভিসের পক্ষ থেকে ক্ষয়ক্ষতির পরিমাণ প্রাথমিকভাবে ১৫ লাখ টাকা ধরা হয়েছে।

### যশোরে আলোচিত

মাহমুদার সেবা গান ভুক্তভোগীরা। সেখানে পাওনা টাকা ফেরত চাইলে তিনি অধীকৃতি জানান। মাহমুদার যশোরে আসার খবর হুড়িয়ে পড়লে শত শত ভুক্তভোগী সেখানে জড়ো হন।

সেবা যায়, শুধু ওই ৩২ জনই নন, বরং করেকশ মানুষের কাছ থেকে তিনি একইভাবে কোটি কোটি টাকা আদায় করেছেন। খবর পেয়ে পুলিশ ঘটনাস্থলে পৌঁছে মাহমুদা ও তার ছেলে তদার জামানকে অটক করে ধানায় নিয়ে আসে।

যশোর কোতোয়ালি থানার ভারপ্রাপ্ত কর্মকর্তা (ওসি) কাকর আহমেদ জানান, 'মাহমুদা খাতুনের বিরুদ্ধে মামলা রেকর্ড করা হয়েছে (মামলাটি করেছেন আব্দুল সোবহান)। তদন্তের জন্য উপ-পরিদর্শক (এসআই) আশরাফুল আলমকে নিযুক্ত করা হয়েছে। ভুক্তভোগীদের অভিযোগগুলো তরুকের সাথে খতিয়ে সেবা হচ্ছে।'

গাণ থেকে যায়। তবে চিন থাকায় মা কিছুটা

কপোলের হ) তুহিন লে দর্শনা বিজিবি ও কা বৈঠক ক শেষে তা সম্পন্ন হতের পেনে ছে হতাতর

ক উপস্থিত র সুবেদার ফের পক্ষে ক্যাম্পার

বধুকে

নান, খবর চম্বার করে ইল জেলা মরসেহের াতে গেলে না যাবে। আইনগত

ব্রিকেন্ট

লন জাতীয় ল অধিদপ্তর চালক মো. সিটিআইয়ের সদস্য এবং লস দল। ারা জানান, তদারকি অব্যাহত

কক্ষে তাকে হত্যা করা হয়েছে। বিশ্ববিদ্যালয় প্রশাসনের কাছে এ হত্যাকাণ্ডের সাথে যারা জড়িত তাদের দ্রুত চিহ্নিত করে শাস্তিমূলক ব্যবস্থা নেওয়ার আহ্বান জানানো হচ্ছে। এছাড়া তিনি প্রশাসনের কাছে বিশ্ববিদ্যালয়ের অস্থায়ী কর্মচারীদের তথ্য নিয়ে আইডি কার্ড প্রদান করে নিরাপত্তার আওতার নিচে আসা ও অফিস শেষ হলে প্রত্যেকটি ভবন

জন্য সরকারের বে পদাধারে যাওয়া প্রয়োজন, প্রশাসন যাবে। একটি মামলা হয়েছে, আমরাও একটা কমিটি করেছি, বিভাগ যাতে সচল থাকে সে ব্যবস্থা নিয়েছি। বর্তমানে ব্যবস্থা নেওয়া যায় সব ব্যবস্থা নেওয়া হবে। অপরাধী জেতার ও তদন্তের ক্ষেত্রে আমরা সবরকম সহযোগিতা করবো। কোনো ছাড় দেওয়া হবে না। রক্ষিত প্রশাসনের

## কিশান এ্যাকুমুলেটরস্ লিমিটেড

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উজিরপুর, বকুলতলা, নড়াইল সদর, নড়াইল।

### জনমত যাচাই সভা বিজ্ঞপ্তি

এতদ্বারা সংশ্লিষ্ট সকলের অবগতির জন্য জানানো যাচ্ছে যে, পরিবেশ সংরক্ষণ বিধিমালা, ২০২৩ এর ১৬ ধারার বিধান অনুসারে কিশান এ্যাকুমুলেটরস্ লিমিটেড, উজিরপুর, বকুলতলা, নড়াইল সদর, নড়াইল-এর শিল্প প্রতিষ্ঠানের পরিবেশগত প্রভাব নিরূপণ (EIA) প্রতিষ্ঠার অংশ হিসেবে একটি জনমত যাচাই সভা আয়োজন করা হয়েছে। উক্ত জনমত যাচাই সভা আগামী ১২/০৩/২০২৬ খ্রি., বুধস্পতিবার, সকাল ১১.০০ ঘটিকার, কিশান এ্যাকুমুলেটরস্ লিমিটেড-এর নির্ধারিত স্থানে অনুষ্ঠিত হবে। এ বিষয়ে সকল গণ্যমান্য ব্যক্তি, স্থানীয় জনগণ ও আত্মীয় ব্যক্তিগণকে উক্ত সভায় উপস্থিত থাকার জন্য বিশেষভাবে অনুরোধ করা যাচ্ছে।

সভায় সংশ্লিষ্ট এলাকার পরিবেশগত বাস্তবসংগত, স্বাস্থ্য ও সামাজিক প্রভাব, সম্ভাব্য ঝুঁকি এবং প্রতিষ্ঠানটির পরিবেশবান্ধব ব্যবস্থাপনা বিষয়ে মতামত প্রদান করা যাবে। সভায় প্রদানকৃত মতামত পরিবেশগত প্রভাব বিবরণী (EIA) প্রতিবেদনে অন্তর্ভুক্ত করার জন্য বিবেচনা করা হবে। কেউ সভায় উপস্থিত থাকতে অপারগ হলে, পরিবেশগত প্রভাব বিবরণী সংক্রান্ত লিখিত মতামত ই-মেইলের মাধ্যমে kishanaccumulations2018@gmail.com ঠিকানায় পাঠানোর জন্য অনুরোধ করা হলো।

নিবেদক

মোহন ভট্টাচার্য

সহকারী ব্যবস্থাপক-হিসাব ও প্রশাসন

কিশান এ্যাকুমুলেটরস্ লিমিটেড

মোবাইলঃ ০১৭৬৪০০৬০৭৮

সি.০২০/২৬

কারণও তাঁবেদারি করে না



চলেন যুদ্ধে  
যাই, অফিসে  
যাওয়ার  
পথে বললেন  
প্রধানমন্ত্রী

স্টাক বিপোর্টার:  
রাজধানীর গুলশানে  
নিজ বাসভবনের  
নরহা বুসে সেখানে  
উপস্থিত সবার  
উদ্দেশ্যে প্রধানমন্ত্রী  
তারেক রহমান  
বললেন, 'চলুন যুদ্ধে  
যাই।' দুলত শেখ  
পরিচালনার কাজকে  
'যুদ্ধ' বলে বুঝিয়েছেন  
জিপি। নকালে  
পৃষ্ঠা ১৭ কলাম ১

ভয়াবহ হামলা  
পাল্টা জবাব ইরানের

মানবজাতির ভেতরঃ দুঃখিমান, বি-২ সিলিং বোমারু বিমান  
যেহেতু বৃষ্টির মতো বোমা ফেলা হয়েছে ইরানে। তেহরানে তেল  
স্থাপনাগুলো জ্বলছে সাঁট সাঁট করে। পুরো তেহরানের আকাশ  
কালো ধোঁয়ায় ঢেকে গেছে। ফলে সেখানে বিধিক্রমা ছড়িয়ে

## इतिहास

স্বাক্ষরঃ এসএসসি ও এইচএসসি  
পরীক্ষার ব্যবস্থাপক (মার্কসিট)  
পরিচিতিঃ- স্বাক্ষরঃ এসএসসি  
পরিচিতির রোল নং-১১১১১১১, রেজিঃ  
নং-১১১১১১১১১১, পাসপোর্ট নং-  
১১১১, বিজ্ঞান-ব্যবসায় শিক্ষা,  
নিজস্ব-১১১১১-১১১১ ও  
এইচএসসি পরীক্ষার রোল নং-  
১১১১১১১১, পাসপোর্ট নং-  
১১১১১১১১১১, পাসপোর্ট নং-১১১১,  
শিক্ষার্থী-১১১১-১১১১, বিজ্ঞান-  
ব্যবসায় শিক্ষা। উক্ত শিক্ষার্থী  
জন্মঃ ১১১১/১১১১/১১১১।  
স্বাক্ষরঃ স্বাক্ষরঃ স্বাক্ষরঃ স্বাক্ষরঃ  
পরিচিতিঃ স্বাক্ষরঃ স্বাক্ষরঃ স্বাক্ষরঃ  
স্বাক্ষরঃ স্বাক্ষরঃ স্বাক্ষরঃ স্বাক্ষরঃ

निष्ठाग विद्वत्ति

[illegible]

निद्राश विद्वत्ति

সূর্যকির বিদ্যি মেডিকেল বেসরকারি  
শিক্ষাপ্রতিষ্ঠান (মহাস্থান) অনুলি  
করায়ো ২ এনপিও পরিদপ্তার-২০২০  
অনুযায়ী বৃত্তিকক বৃত্তিপুত্র নবিল  
মহাস্থান, অক্ষাণ্ড বরু গাইবান্ধা,  
উপজেলায় নাস্তাপুত্র, জন্মের তারিখ  
এর জন্য একজন অসিস সহায়ক  
আবশ্যক। প্রার্থীকে জে.বি.পি.  
এস.সি.বি.কোর্সেই মহাস্থান শিক্ষা বোর্ড  
কর্তৃক সমনয়ন পাল হয়ে হবে। অতী  
প্রার্থীকে বিদ্যির প্রকাশের ১২  
(দশের) দিনের মধ্যে পেশাবী হাতে,  
নাস্তাপুত্র পাঠার অনুকুলে  
(বকেসরকারি) ৩০০০/- (এ  
হাজার) টাকার হাতে প্রকৃতি (এ.  
অক্ষি, ২ কপি পাসপোর্ট সাইজের  
ছবি ও প্রয়োজির সকল প্রকার  
কাল্পনিক প্রকৃতি প্রকাশের অধি  
হতে আশাযী ৩০.০৬.২০২০ই  
অধিরের মধ্যেই জরাজর সুপার  
বর্তার মরফার আশ্রয় কা যাচ্ছে।  
কাল্পনিক সুপার, বৃত্তিকক বৃত্তিপুত্র  
নবিল মহাস্থান, নাস্তাপুত্র, গাইবান্ধা।  
মহাস্থান-৩০০০/২০

शत्रुघ्न

অতি সন্তোষজনক উপায়ে (৪৭), শিল্প-বৃত্তি  
আবুল হোসেন, মাদার-বোতা: সিনিয়র  
বিশেষ, ১। মফস্বিল পরীক্ষা-১৯৬০-৬১।  
সমন্বয়, রোল নং-১৪৪৭৭, রেজিষ্টার নং-  
৪৪৪৯০, ২। মফস্বিল পরীক্ষা-১৯৬১-৬২।  
সমন্বয়, রোল নং-৬৬৬২, রেজিষ্টার নং-  
২০০০৭, ৩। মফস্বিল পরীক্ষা-১৯৬২-৬৩।  
সমন্বয়, রোল নং-১২৩০২, রেজিষ্টার নং-  
১৯০৪৫ (হাইস্কুল)। জাতি  
পরিচয়পত্র নং-৪৪৪৪০১৩১৩৮৫।  
সংগৃহীত নং-০১৪৪৪-৬৬৬৬০১৩, বঙ্গ  
বিশ্ববিদ্যালয়, ঢাকা: অধ্যাপক, ইতিহাস-  
২৯৬, ডায়. ০৭-০০২-০২৪৮।  
১৯৬৫-৬৬৬৬২।



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[www.nctb.gov.bd](http://www.nctb.gov.bd)

Ref. No.: 37.06.0000.303.07.017.25/44

Date: 08/03/2026

### Invitation for e-Tender (OTM)

This is to notify to all concerned tenderers that the following tenders have been published by National Curriculum and Textbook Board (NCTB) through the e-GP portal ([www.eprocure.gov.bd](http://www.eprocure.gov.bd)) regarding Post- Landing Inspection (PLI) Service for Textbooks of Secondary (Bangla and English Version), Ebtedayee, Dakhil, SSC & Dakhil (Vocational) and Technical (Trade Books) of AY-2026.

| Tender Date and Time                        |                            |                                          |                         |
|---------------------------------------------|----------------------------|------------------------------------------|-------------------------|
| <b>Tender Publication:</b>                  | 9/03/2026<br>10:00 AM      | <b>Tender Document<br/>last selling:</b> | 24/03/2026;<br>12:00 PM |
| <b>Tender/Proposal<br/>Closing/Opening:</b> | 24/03/2026;<br>14:00 PM    | <b>Source of Fund:</b>                   | GoB                     |
| <b>Procuring Entity:</b>                    | Member<br>(Textbook), NCTB | <b>Nature of e-Tender</b>                | NCT, Goods              |

Tender ID: 1242894

Interested tenderers may visit [www.eprocure.gov.bd](http://www.eprocure.gov.bd) website to get the details of the Tender. This is an online tender where only e-Tender will be accepted in the national e-GP portal and no offline/hard copy will be accepted. To submit e-tender, you are requested to go through the [www.eprocure.gov.bd](http://www.eprocure.gov.bd) web portal.

NB: The (Ref: 6366) notice published by NCTB no 347 dated 29/12/2025 is hereby cancelled.

08-03-2021

(Prof. Md. Shahtab Uddin)

Secretary

Phone: 2233-85644

Email: [secretary@nctb.gov.bd](mailto:secretary@nctb.gov.bd)

मास(नं)-३०३/२३ (३"×०)

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার  
পরিবেশ অধিদপ্তর  
নড়াইল জেলা কার্যালয়  
চৌধুরী লজ (২য় তলা)  
কেন্দ্রীয় জামে মসজিদ রোড, নড়াইল সদর, নড়াইল  
[www.doe.gov.bd](http://www.doe.gov.bd)

স্মারক নম্বর: ২২.০২.৪০৬৫.৬০৭.৭২.০০১.২৫-৭০(ক)

তারিখ: ০৮/০৪/২০২৬

বিষয়: পরিবেশ সংরক্ষণ বিধিমালা, ২০২৩ এর বিধি ১৬ অনুসারে নড়াইল জেলার উজিরপুর, বকুলতলা, নড়াইল ঠিকানায় প্রভাবিত  
কিষাণ গ্র্যাকুমুলেটরস লিমিটেড নামক লেড এসিড ব্যাটারি প্রস্তুতকারক প্রতিষ্ঠান স্থাপনের লক্ষ্যে পরিবেশগত প্রভাব নিরূপণ সমীক্ষা  
(EIA) এর উপর জনমত যাচাই সংক্রান্ত সভার কার্যবিবরণী।

প্রধান অতিথি: জনাব মোঃ আব্দুল মালেক মিয়া, সহকারী পরিচালক, পরিবেশ অধিদপ্তর, নড়াইল জেলা কার্যালয়।

সভাপতি: জনাব মোহন ভট্টাচার্য, সহকারী ব্যবস্থাপক, কিষাণ গ্র্যাকুমুলেটরস লিমিটেড।

বিশেষ অতিথি: ইঞ্জিনিয়ার জনাব হোসাইন মোঃ সজিব, পরামর্শক প্রতিষ্ঠানের প্রতিনিধি।

সভার তারিখ: ১২ মার্চ, ২০২৬ খ্রিঃ

সময়: সকাল ১১:০০টা থেকে দুপুর ১২:৩০টা পর্যন্ত

সভার স্থান: প্রস্তাবিত কিষাণ গ্র্যাকুমুলেটরস লিমিটেড-এর ডাকবাংলো,

উজিরপুর, বকুলতলা, নড়াইল।

সভাপতি উপস্থিত সকলকে স্বাগত জানিয়ে সভার কার্যক্রম শুরু করেন। সভার উদ্দেশ্য ও সভায় অংশগ্রহণের জন্য তিনি সবাইকে  
ধন্যবাদ জ্ঞাপন করেন এবং সভায় উপস্থিত ব্যক্তিদের উদ্দেশ্যে বক্তব্য রাখেন। সভাপতির বক্তব্যে উল্লেখ করেন যে, পরিবেশ সংরক্ষণ  
বিধিমালা, ২০২৩ এর বিধি ১৬ অনুসারে নড়াইল জেলার উজিরপুর, বকুলতলা, নড়াইল ঠিকানায় প্রস্তাবিত কিষাণ গ্র্যাকুমুলেটরস  
লিমিটেড নামক লেড এসিড ব্যাটারি প্রস্তুতকারক প্রতিষ্ঠান স্থাপনের লক্ষ্যে পরিবেশগত প্রভাব নিরূপণ সমীক্ষা (EIA) এর উপর জনমত  
যাচাই সংক্রান্ত সভার আয়োজন করা হয়েছে। এ জনমত যাচাই সভায় সরকারি কর্মকর্তা, সকল পেশাজীবী, জনপ্রতিনিধি ও স্থানীয়  
জনগণের মতামত প্রদান অত্যন্ত গুরুত্বপূর্ণ।

সভাপতি সভার শুরুতেই সম্মানিত প্রধান অতিথি, বিশেষ অতিথি, বিভিন্ন প্রতিষ্ঠানের/সংস্থার প্রতিনিধি এবং স্থানীয় বাসিন্দাদেরকে  
প্রস্তাবিত প্রতিষ্ঠানের বিভিন্ন কার্যক্রম সম্পর্কে অবহিত করেন। এসময় উপস্থিত পরামর্শক প্রতিষ্ঠানের প্রতিনিধি ইঞ্জিনিয়ার জনাব হোসাইন  
মোঃ সজিব, উপস্থিত ব্যক্তিদের প্রস্তাবিত প্রতিষ্ঠানের উৎপাদন প্রক্রিয়া এবং তার পরিবেশগত প্রভাব ও প্রতিকার সম্পর্কে অবহিত  
করেন।

প্রতিষ্ঠানের বিভিন্ন অংশ সরেজমিন পরিদর্শন শেষে প্রধান অতিথি, কর্মকর্তাবৃন্দ এবং সংশ্লিষ্ট সকলে সভামূলে ফিরে আসেন এবং  
আলোচনা সভার কাজ শুরু করেন। সভার শুরুতে স্বাগত বক্তব্য রাখেন পরিবেশ অধিদপ্তর, নড়াইল জেলা কার্যালয়ের সহকারী

পরিচালক জনাব মোঃ আব্দুল মালেক মিয়া। তিনি তার বক্তব্যে উল্লেখ করেন যে, প্রস্তাবিত কিম্বা গ্র্যান্ডমুলেটরস লিমিটেড নামক লেড এসিড ব্যাটারি প্রস্তুতকারক প্রতিষ্ঠানটি স্থাপনের লক্ষ্যে জনমত যাচায়ের জন্য পত্রিকাধা বিজ্ঞপ্তি প্রকাশ করা হয়েছে। এ বিজ্ঞপ্তিতে সাড়া দিয়ে এখনে ঘারা এসেছেন তাদেরকে তিনি ধন্যবাদ জানান। এরপর পরামর্শক প্রতিষ্ঠানের প্রতিনিধিকে পরিবেশগত প্রভাব নিরূপণ (EIA) এবং প্রকল্পের সার্বিক কার্যক্রমের উপর একটি উপস্থাপনা প্রদান করতে আহবান জানান।

আলোচ্য প্রকল্পের সংশ্লিষ্ট পরামর্শক প্রতিষ্ঠানের প্রতিনিধি জনাব হোসাইন মোঃ সজিব উপস্থাপনা দিতে গিয়ে সভাকে অবহিত করেন যে-

ক) প্রস্তাবিত প্রতিষ্ঠানটি একটি লেড এসিড ব্যাটারি প্রস্তুতকারী কোম্পানি হিসাবে কার্যক্রম পরিচালনা করবে।

খ) প্রতিষ্ঠানের উৎপাদন কার্যক্রম পরিচালনার লক্ষ্যে স্থাপিত জেনারেটরের ধোঁয়া নির্গমনের জন্য যথাযথ উচ্চতার চিমনি নির্মাণ করা হবে। গ্রহাডাও শব্দ দূষণ নিয়ন্ত্রণে জেনারেটরে সাইলেন্সার সংযোজন করা হবে। তাছাড়া, ফ্যান্টুরিতে পর্যাপ্ত বাফার স্পেস রাখা হবে যাতে শব্দ দূষণ কমানো সম্ভব হয়। প্রতিষ্ঠানের উৎপাদন কার্যক্রমের বিভিন্ন ধাপে ডাস্ট তৈরি হতে পারে এবং তৈরিকৃত ডাস্ট পরিবেশসম্মতভাবে ব্যবস্থাপনার জন্য ডাস্ট কালেক্টর ব্যবহার করা হবে। উৎপাদন কার্যক্রমের বিভিন্ন ধাপে ফিউম তৈরি হতে পারে এবং তৈরিকৃত ফিউম পরিবেশসম্মতভাবে ব্যবস্থাপনার জন্য ফিউম কালেক্টর ব্যবহার করা হবে। পরিবেশ অধিদপ্তরের নিয়ম মেনে ধোঁয়া নির্গমনের জন্য যথাযথ চিমনি নির্মাণ করা হবে।

গ) কঠিন বর্জ্য বিধি মোতাবেক সংগ্রহ ও নিরাপদ ব্যবস্থাপনার লক্ষ্যে পুনঃ ব্যবহারকে অগ্রাধিকার দেওয়া হবে এবং প্রয়োজনে অনুমোদিত সংস্থার নিকট হস্তান্তর করা হবে।

ঘ) প্রস্তাবিত প্রতিষ্ঠান হতে সৃষ্ট তরল বর্জ্য পরিশোধনের জন্য ETP নির্মাণ করা হবে। পরিশোধিত পানি পুনরায় ব্যবহারে অগ্রাধিকার দেওয়া হবে।

অতঃপর সভার আলোচ্যসূচি অনুযায়ী উপস্থিত সকলে উন্মুক্ত আলোচনায় অংশগ্রহণ করেন। সভার আলোচনা ও সিদ্ধান্ত নিম্নে উল্লেখ করা হলো:

আলোচনা:

ক) উপস্থিত স্থানীয় বেসরকারি চাকরিজীবী জনাব হাফিজুর রহমান মোল্লা (৫০) আলোচ্য প্রতিষ্ঠানের কার্যক্রম সম্পর্কে অবহিত আছেন জানিয়ে পরিবেশ রক্ষায় নেওয়া উদ্যোগকে স্বাগত জানান। তিনি মনে

করেন প্রতিষ্ঠান কার্যক্রম শুরু হলে এলাকাবাসী উপকৃত হতে পারবেন। এসময় তিনি বাতাস এবং পানি দূষণ রোধে পরিবেশসম্মত পদক্ষেপ নেওয়ার আহবান জানান।

খ) উপস্থিত নড়াইল পৌরসভার সাবেক কাউন্সিলর শ্রীযুক্ত অরুণ সাহা (৫০) মনে করেন প্রতিষ্ঠান কার্যক্রম শুরু হলে এলাকার উন্নয়ন হবে। তিনি পরিবেশের ভারসাম্য বজায় রেখে উৎপাদন কার্যক্রম পরিচালনার উপর জোর দেন। সাথে সাথে, তিনি এলাকার শ্রমিকদের জন্য উপযুক্ত চাকরি নিশ্চিত করার দাবি জানান।

গ) উপস্থিত স্থানীয় বাসিন্দা জনাব মোঃ আব্দুল জব্বার স্থানীয় জনগণের জন্য নতুন নিয়োগের ক্ষেত্রে বিশেষ সুবিধা দেওয়ার আহবান জানান।

*Mr*

ঘ) উপস্থিত স্থানীয় কৃষক জনাব কেবল মোঃ (৩৭) উপরে উল্লিখিত জনাব আব্দুল জব্বারের কথা সমর্থনপূর্বক পুনর্ব্যক্ত করেন।

ঙ) উপস্থিত স্থানীয় বাসিন্দা শ্রীমতী বাসন্তী বিশ্বাস মনে করেন, প্রতিষ্ঠান কার্যক্রম শুরু হলে এলাকার মানুষের ভালো হবে। তিনি মহিলাদের কর্মসংস্থানের কোনো ব্যবস্থা থাকবে কি না তা জানতে চান।

চ) প্রস্তাবিত প্রতিষ্ঠানের প্রতিনিধি মোহন ভট্টাচার্য জানান, প্রতিষ্ঠান পরিচালনায় পরিবেশকে সর্বোচ্চ গুরুত্ব দেওয়া হবে। তিনি জানান, অদক্ষ কর্মী নিয়োগে স্থানীয়দের প্রাধান্য দেওয়া হবে। তাছাড়াও, যোগ্যতা বিবেচনায় স্থানীয়দের অন্যান্য কাজেও নিয়োগ দেওয়ার সুপারিশ করা হবে। নারীদের জন্যও কর্মসংস্থানের সুযোগ থাকবে বলে তিনি জানান। তাছাড়া, প্রস্তাবিত প্রকল্প সম্পর্কে বিস্তারিত আলোচনা করেন এবং মালিক পক্ষের প্রতিনিধি হিসাবে পরিবেশের জন্য ছমকি তৈরি করে এমন কিছু থেকে বিরত থাকার ব্যাপারে আশ্বস্ত করেন। এছাড়াও, স্থানীয় জনসাধারণের যে কোনো অভিযোগ দ্রুত আমলে নিয়ে তা সমাধানের ব্যাপারেও আশ্বস্ত করেন।

ছ) পরামর্শক প্রতিষ্ঠানের প্রতিনিধি ইঞ্জিঃ জনাব হোসাইন মোঃ সজিব তরল বর্জ্য পরিশোধনে ETP এবং বায়ুদূষণ রোধে ATP-এর ব্যবহার নিয়ে বিস্তারিত আলোচনা করেন। শব্দ দূষণ নিয়ন্ত্রণে নেওয়া ব্যবস্থা সম্পর্কে তিনি বলেন, জেনারেটরের শব্দ দূষণ এড়াতে ক্যানোপি স্থাপন করা হবে এবং ১০ ইঞ্চি পুরু দেওয়াল নির্মাণ করা হবে। তাছাড়া, ফ্যাক্টরিতে পর্যাপ্ত বাফার স্পেস রাখা হবে যাতে শব্দ দূষণ কমানো সম্ভব হয়।

জ) সমাপনী বক্তব্যে পরিবেশ অধিদপ্তর, নড়াইল জেলা কার্যালয়ের সহকারী পরিচালক জনাব মোঃ আব্দুল মালেক মিয়া উপস্থিত সবাইকে ধন্যবাদ জানান। উক্ত প্রতিষ্ঠানের ব্যাপারে কোনো ব্যক্তি কিংবা প্রতিষ্ঠানের কোনো অভিযোগ আছে কি না জানতে চাওয়া হয়। উক্ত প্রতিষ্ঠানের ব্যাপারে কোনো ব্যক্তি কিংবা প্রতিষ্ঠানের কোনো অভিযোগ নেই মর্মে উপস্থিত সবাই জানান। জনাব মোঃ আব্দুল মালেক মিয়া আরও জানান, 'পরিবেশগত প্রভাব নিরূপণ' প্রতিবেদনের বিজ্ঞপ্তি প্রকাশের ৩০ (ত্রিশ) কার্যদিবস পর্যন্ত অধিদপ্তরের ওয়েবসাইটসহ সংশ্লিষ্ট কার্যালয়ে মতামত প্রদান করা যাবে। তবে শর্ত থাকে যে, খসড়া পরিবেশগত প্রভাব নিরূপণ প্রস্তুতের ৪৫ (পঁয়তাল্লিশ) কার্যদিবসের মধ্যে জনমত যাচাই সম্পন্ন করতে হবে। উক্ত সময়ের মধ্যে প্রস্তাবিত প্রতিষ্ঠানের ব্যাপারে কোনো প্রকার অভিযোগ থাকলে জানানো যাবে অথবা হেল্পলাইন নম্বর ৩৩৩৪-এ কল করেও জানানো যাবে।

#### সিদ্ধান্তসমূহঃ

১) প্রস্তাবিত কৃষাণ গ্র্যাকুয়ুলেটরস লিমিটেড নামক লেড এসিড ব্যাটারি প্রস্তুতকারক প্রতিষ্ঠানটি পরিচালনার সময় সৃষ্ট ভরল বর্জ্য পরিশোধনের জন্য যথাযথ ক্ষমতার ETP স্থাপন করতে হবে।

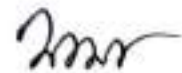
২) বর্জ্য ব্যবস্থাপনা বিধিমালা মোতাবেক বর্জ্য সংগ্রহ, সংরক্ষণ, পরিবহন ও নিষ্পত্তি করতে হবে।

৩) পানি পরিশোধনপূর্বক ব্যবহার বাড়াতে পদক্ষেপ নিতে হবে।

৪) বায়ু দূষণ রোধে যথাযথ ক্ষমতার ATP স্থাপন করতে হবে।

৫) অদক্ষ লোকবল নিয়োগের ক্ষেত্রে স্থানীয় জনগণের জন্য বিশেষ সুবিধা প্রদান করতে হবে।

৬) প্রস্তাবিত প্রতিষ্ঠানের খালি জায়গায় সবুজ বৃক্ষ এবং গাছপালা রোপণের মাধ্যমে পরিবেশের ভাবসাম্য রক্ষা করতে হবে।



বর্ণিত সুপারিশসমূহ জানিয়ে সভা শেষে প্রেরণের জন্য সর্বসম্মতিক্রমে সিদ্ধান্ত গৃহীত হয়।

পরিশেষে সভাপতি সভায় অংশগ্রহণকারী সকলকে ধন্যবাদ জ্ঞাপন করে বর্তমান ও ভবিষ্যৎ প্রজন্মের জন্য একটি সুস্থ ও নিরাপদ পরিবেশ নিশ্চিত করার প্রত্যয়ে আহবান জানান। সভায় আর কোনো আলোচনা বা থাকায় সভাপতি সকলকে ধন্যবাদ জানিয়ে সভায় সমাপ্তি ঘোষণা করেন।

  
মোঃ আবিদুল হাকিম ডি.সি.  
সহকারী পরিচালক  
পরিবেশ অধিদপ্তর  
(মহাবিদ্যালয় কলকাতা-১৯১২)

সহকারী পরিচালক

পরিবেশ অধিদপ্তর, নড়াইল

# KISHAN ACCUMULATORS LTD.

Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh

## List of Participants for the Focus Group Discussion (Public Consultation)

Date: 12 - 03 - 2026

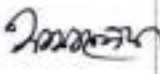
Time: 10:00 AM - 12:00 PM

Address: Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh

Longitude: 23.127414° N

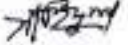
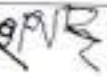
Latitude: 89.520820° E

Facilitator: KISHAN ACCUMULATORS LTD.

| Sl. No | Name of Participant                                      | Age | Occupation                           | Mobile No.   | Comments                                                                                                                 | Signature                                                                             |
|--------|----------------------------------------------------------|-----|--------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1.     | Mr. Abdul Makomia<br>Asst. Director.<br>DOE, Narail.     | 48  | Gov. Service                         | 01712086466  | উপস্থিত হুজুর (অবসর) -<br>অভ্যন্তরীণ পরিচিতি এবং অধীক্ষ<br>সম্প্রদায়িক পরিচিতি (অবসর)<br>দ্বারা বিবেচিত হবে এবং মন্তব্য |    |
| 2.     | Mr. Mahmud Hossain<br>Sample Collection.<br>DOE, Narail. | 23  | Govt. Service                        | 01791-180280 | এম এম এম - অধীক্ষার পরিচিতি<br>এম (অবসর) করে।                                                                            |   |
| 3.     | Moham Bhattacharya                                       | 35  | Asst. Manager<br>Accounts &<br>Admin | 01764006098  | -                                                                                                                        |  |

# KISHAN ACCUMULATORS LTD.

Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh.

| Sl. No | Name of Participant                                 | Age | Occupation   | Mobile No.      | Comments                                                                    | Signature                                                                             |
|--------|-----------------------------------------------------|-----|--------------|-----------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 4.     | শ্রীমান মোহন<br>মোহন মোহন<br>মোহন মোহন<br>মোহন মোহন | ৫০  | কৃষক         | ০১৭০৩৮০৭৫<br>৬০ | মোহন, মোহন - ১৭৭৫<br>২-মোহন (মোহন মোহন)<br>মোহন মোহন মোহন<br>মোহন মোহন মোহন |    |
| 5.     | শ্রীমান মোহন                                        | ৪৬  | কৃষক         | ০১৭৭৭৭৬৭৭       | —                                                                           |    |
| 6.     | মো: মোহন মোহন<br>কিশান মোহন<br>মো:                  | ৪২  | P.M          | ০১৭২৩-০৫৫৭২৮    | —                                                                           |    |
| 7.     | শ্রীমান মোহন                                        | ৪৫  | কৃষক<br>মোহন | ০১৭০৭৭০<br>৭৫৬৭ | —                                                                           |    |
| 8.     | মো: মোহন<br>মোহন                                    | ৩৭  | কৃষক         | ০১৭২২৭৭<br>৭১৫৮ | —                                                                           |  |

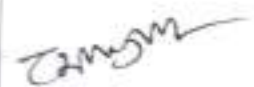
# KISHAN ACCUMULATORS LTD.

Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh.

| Sl. No | Name of Participant         | Age | Occupation | Mobile No.       | Comments                                                                     | Signature        |
|--------|-----------------------------|-----|------------|------------------|------------------------------------------------------------------------------|------------------|
| 9.     | মহা. হাবিবুল<br>হাসান মিয়া | 50  | কৃষক       | 01774090<br>578  | —                                                                            | হাবিবুল          |
| 10.    | মুহাম্মদ হাবিবুল            | 55  | কৃষক       | 018298<br>545712 | —                                                                            | মুহাম্মদ হাবিবুল |
| 11.    | মুহাম্মদ হাবিবুল            | 65  | কৃষক       |                  | —                                                                            | মুহাম্মদ         |
| 12.    | মুহাম্মদ হাবিবুল            | 45  | কৃষক       | 01732<br>841876  | —                                                                            | মুহাম্মদ         |
| 13.    | মুহাম্মদ হাবিবুল            | 35  | কৃষক       | 01956992562      | মুহাম্মদ হাবিবুল<br>মুহাম্মদ হাবিবুল<br>মুহাম্মদ হাবিবুল<br>মুহাম্মদ হাবিবুল | মুহাম্মদ         |

# KISHAN ACCUMULATORS LTD.

Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh.

| Sl. No | Name of Participant                                                               | Age | Occupation | Mobile No.   | Comments                                           | Signature                                                                           |
|--------|-----------------------------------------------------------------------------------|-----|------------|--------------|----------------------------------------------------|-------------------------------------------------------------------------------------|
| 14.    | বিশ্বাস বিশ্বাস                                                                   | 38  | কাজ        | 01710-11782  | বিশ্বাসযোগ্য হলে<br>কাজে পরিচালনা<br>করা হবে।      |  |
| 15.    |  | 33  | কাজ        | 01930-358620 | —                                                  |  |
| 16.    | Tapan                                                                             | 40  | কাজ        | 01876-563688 | স্বাক্ষর করে প্রদত্ত<br>খুব সমস্তই উন্নয়ন<br>হবে। | Tapan                                                                               |
| 17.    | সবুজ রানু রানু                                                                    | 20  | কাজ        | 01312237427  | —                                                  | সবুজ                                                                                |

# KISHAN ACCUMULATORS LTD.

Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh.

| Sl. No | Name of Participant | Age | Occupation        | Mobile No.      | Comments                                                         | Signature |
|--------|---------------------|-----|-------------------|-----------------|------------------------------------------------------------------|-----------|
| 18.    | মোঃ হাবিব<br>(      | ৩৫  | ফার্মার<br>সহকারী | ০১৭৬৩<br>১০১১৪২ | —                                                                | হাবিব     |
| 19.    | মোঃ গোলাম মরহাট     | ৩২  | ফার্মার<br>সহকারী | ০১৭৩৭<br>০৩০৬৬২ | ফার্মার পারিবারিক<br>সেবা এবং উৎপাদন<br>দিয়ে কৃষকদের<br>সহায়তা | গোলাম     |
| 20.    | মো.আ. হোসেন         | ৩৬  | ফার্মার<br>সহকারী | ০১৭৫৭৬২<br>৪৬৭০ | —                                                                | আমো       |
| 21.    | ফার্মার হাবিব       |     | ৫                 | .               | —                                                                | হাবিব     |
| 22.    | ফার্মার             |     | ৫                 | .               | —                                                                | ফার্মার   |

# KISHAN ACCUMULATORS LTD.

Uzirpur, Bakultola, Narail Sadar, Narail, Bangladesh.

| Sl. No | Name of Participant | Age | Occupation | Mobile No. | Comments | Signature |
|--------|---------------------|-----|------------|------------|----------|-----------|
| 23.    | বাসন্তী বিশ্বাস     |     | কানিয়া    | .          | —        | বাসন্তী   |
| 24.    | লোনা-খাদিকা<br>বোম  |     | u          | .          | —        | খাদিকা    |
| 25.    |                     |     |            |            |          |           |
| 26.    |                     |     |            |            |          |           |
| 27.    |                     |     |            |            |          |           |

***Annexure IV***

***ETP Drawing & Design***

# ETP Operational Manual with Design Calculation

## **INDUSTRIAL EFFLUENT TREATMENT PLANT**

**CAPACITY 0.50m<sup>3</sup>/Hr.(5.0m<sup>3</sup>/Day).**

**(10 Hour Operation Basis)**

**Treatment Process:**

**Physico-Chemical Treatment Process**

### **PROJECT NAME**

**KISHAN ACCUMULATORS LTD.**

**Factory Address: Uzirpara, Bakultala, Narail  
Sadar, Narail, Bangladesh.**

**Technical Support  
EPL ENGINEERING  
"Smartly Treat Your Water"**



**Address: House# 31, Road# 01, Sector# 09, Uttara,  
Dhaka-1230.**

**Contact: 01829907307**

## Project Details

| Name of the Project    | Details                        |                                                                         |
|------------------------|--------------------------------|-------------------------------------------------------------------------|
| <b>Project Summary</b> | Name of the Project            | <b>KISHAN ACCUMULATORS LTD.</b>                                         |
|                        | Factory Address                | Factory Address: Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. |
|                        | Final Product                  | Lead acid Battery Manufacturing                                         |
|                        | Production Capacity            | 50.00 units/Day                                                         |
|                        | ETP (Effluent Treatment Plant) | 0.50m <sup>3</sup> /Hr.(5.0m <sup>3</sup> /Day).                        |

### Factory total water usage data

| Name of Section                                                                 | Water Volume per Section/Day | Total Water Volume (m <sup>3</sup> ) Per day | Remarks                             |
|---------------------------------------------------------------------------------|------------------------------|----------------------------------------------|-------------------------------------|
| Pasting Section                                                                 | 200 ltr                      | 0.20                                         | <b>Total Production (2.0 Shift)</b> |
| Curing Section                                                                  | 500 ltr                      | 0.50                                         |                                     |
| IB section                                                                      | 500 Ltr                      | 0.50                                         |                                     |
| Formation Section                                                               | 500 ltr                      | 0.50                                         |                                     |
| Washing-Drying Section                                                          | 500ltr                       | 0.50                                         |                                     |
| VRLA Charging                                                                   | 200 ltr                      | 0.20                                         |                                     |
| Solar Charging                                                                  | 500ltr                       | 0.50                                         |                                     |
| Domestic Purpose (Sewage, cleaning, drinking (RO), canteen, construction, Etc.) | 2000 ltr                     | 2.00                                         |                                     |
| Fire Fighting purpose                                                           | 20000 ltr                    | 20.0                                         |                                     |
| Utilities purpose                                                               | 1000 ltr                     | 1.0                                          |                                     |
| Others                                                                          | 1000 ltr                     | 1.0                                          |                                     |

## **Total Wastewater Generation Data**

| <b>Name of Section</b> | <b>Wastewater Volume per Section/Day</b> | <b>Total Wastewater Volume (m<sup>3</sup>) Per day</b> | <b>Remarks</b> |
|------------------------|------------------------------------------|--------------------------------------------------------|----------------|
| Pasting Section        | <b>200 ltr</b>                           | <b>0.20</b>                                            |                |
| Curing Section         | <b>500 ltr</b>                           | <b>0.50</b>                                            |                |
| IB section             | <b>500 Ltr</b>                           | <b>0.50</b>                                            |                |
| Formation Section      | <b>500 ltr</b>                           | <b>0.50</b>                                            |                |
| Washing-Drying Section | <b>500ltr</b>                            | <b>0.50</b>                                            |                |
| VRLA Charging          | <b>200 ltr</b>                           | <b>0.20</b>                                            |                |
| Solar Charging         | <b>500ltr</b>                            | <b>0.50</b>                                            |                |
| <b>Total Volume</b>    |                                          | <b>2.90m<sup>3</sup>/Day</b>                           |                |

## **WASTE WATER GENERATION FROM KISHAN ACCUMULATORS LTD.**

### **ETP Capacity Calculation**

| Name of Items                      | Details of items                                       | Remarks                                |
|------------------------------------|--------------------------------------------------------|----------------------------------------|
| Type of Industry/Process           | Lead Acid Battery Manufacturing                        |                                        |
| Product type                       | Lead Acid Battery Manufacturing                        |                                        |
| Production Capacity                | 6000.00 Units/Day                                      |                                        |
| Wastewater Generation Sources      | Lead Acid Battery Manufacturing different sections     |                                        |
| Total Waste Water Generation       | 2.90m <sup>3</sup> /Day                                | Considering safety factor,10%          |
| Safety factor, Total Wastewater    | 3.20m <sup>3</sup> /Day                                | Safety 0.3m <sup>3</sup> /Day          |
| ETP Capacity Need                  | 0.50 m <sup>3</sup> /Hour                              | Max. Need 7Hrs. Operation              |
| We Considering ETP Design Capacity | Flow-0.50m <sup>3</sup> /Hr. (5.0m <sup>3</sup> /Day). | We Considering 10 Hrs. Operation Basis |
| ETP Process Method                 | Physico-Chemical                                       | Physical device & Chemical method      |

**Note: All wastewater data collection from physical field visit & Factory production personnel have provided Data based on their practical experience.**

## **Mechanical Unit Specification:**

### **Air Blower for Equalization Tank & Chemical Mixing TANK:**

#### **Type: Roots Blower**

Origin: Taiwan

Quantity: 2(1W+1) Pcs

Capacity: 20-30 m<sup>3</sup>/hr.

Motor Capacity: 1.0 hp

Motor Brand: Taiwan

#### **Effluent Transfer Pump:**

Type: Centrifugal

Origin: China/Taiwan

Quantity: 2(1W +1S)

Capacity: 0.50 m<sup>3</sup>/hr.

Head: 15-10 m

Motor Capacity: 0.5 hp

### **SLUDGE TRANSFER PUMP:**

Type: Submersible/Mud Pump

Origin: China/Taiwan

Quantity: 2(1W +1S)

Capacity: 0.50 m<sup>3</sup>/hr.

Head: 15-10 m

Motor Capacity: 0.5 hp

SLUDGE TRANSFER PUMP

### **METERING DOSING PUMP:**

Type: Metering Dosing

Origin: ITC, China

Quantity: 5(2W+2W)

Capacity: 10-30Ltr.& 0-15ltr

Pressure: 5 bar

Motor Capacity: 40 W

**FILTER FEED PUMP:**

Type: centrifugal

Origin: Taiwan

Quantity: 2

Capacity: 0.5 m<sup>3</sup>/hr.

Head: 15m -10m

Motor Capacity: 0.5 Hp

**Agitator:**

Origin: China

Quantity: 5(5W+0S) Pcs

RPM: Coagulation 150 rpm & Flocculation 50 rpm

Motor Capacity: 0.5 hp & 0.5hp

## **Multigrade Sand Filter**

|                                   |                    |   |                    |
|-----------------------------------|--------------------|---|--------------------|
| Qty                               |                    | : | One                |
| Type                              |                    | : | Down flow          |
| Model                             |                    | : | MGF- 1252          |
| Diameter                          | mm                 | : | 400                |
| Height on Straight                | mm                 | : | 1300               |
| Design Pressure                   | kg/cm <sup>2</sup> | : | 10                 |
| Material of Construction          | <u>Shell</u>       | : | FRP/MS             |
|                                   | Dished End         |   |                    |
| Flow rates                        |                    |   |                    |
| Treatment flow rate.              | M <sup>3</sup> /h  | : | 0.5 max.           |
| Backwash flow rate                | m <sup>3</sup> /h  | : | 0.25               |
| Frequency of backwash             |                    | : | Twice in a day     |
| Time for backwash                 | min                | : | 20 (Approximately) |
| Depth of media                    | mm                 | : | 65%                |
| Max. Pressure drop across the bed | kg/cm <sup>2</sup> | : | 0.8                |

## **Activated Carbon Media Filter (ACF)**

|                                   |                    |                      |
|-----------------------------------|--------------------|----------------------|
| Qty                               |                    | : One                |
| Type                              |                    | : Down flow          |
| Model                             |                    | : MGF- 1252          |
| Diameter                          | mm                 | : 400                |
| Height on Straight                | mm                 | : 1300               |
| Design Pressure                   | kg/cm <sup>2</sup> | : 10                 |
| Material of Construction          | <u>Shell</u>       | : FRP/MS             |
|                                   | Dished End         |                      |
| Flow rates                        |                    |                      |
| Treatment flow rate.              | M <sup>3</sup> /h  | : 0.50 max.          |
| Backwash flow rate                | m <sup>3</sup> /h  | : 0.25               |
| Frequency of backwash             |                    | : Twice in a day     |
| Time for backwash                 | min                | : 20 (Approximately) |
| Depth of media                    | mm                 | : 65%                |
| Max. Pressure drop across the bed | kg/cm <sup>2</sup> | : 0.8                |

## LAB INSTRUMENT

**P<sup>H</sup> Meter ,TSS & Temperature Meter:**

|                 |                              |
|-----------------|------------------------------|
| <b>Quantity</b> | <b>2 Nos.</b>                |
| <b>Make</b>     | <b>Romania/Europe/Taiwan</b> |
| <b>Type</b>     | <b>Automated</b>             |

| Effluent Treatment Plant (ETP) |              |               |                    |                 |            |                   |
|--------------------------------|--------------|---------------|--------------------|-----------------|------------|-------------------|
| Log Sheet- Shift: A            |              |               |                    |                 | Date:      |                   |
| Time                           | Raw Effluent | Treated Water | Flow Meter Reading |                 | Outlet TSS | Per Day Generated |
|                                | pH           | pH            | Inlet (m3/hr.)     | Outlet (m3/hr.) | (mg/L)     | Dry Sludge (Kg)   |
| 6.00 am                        |              |               |                    |                 |            |                   |
| 7.00 am                        |              |               |                    |                 |            |                   |
| 08.00 am                       |              |               |                    |                 |            |                   |
| 09.00 am                       |              |               |                    |                 |            |                   |
| 10.00 am                       |              |               |                    |                 |            |                   |
| 11.00 am                       |              |               |                    |                 |            |                   |
| 12.00 pm                       |              |               |                    |                 |            |                   |
| 1.00 pm                        |              |               |                    |                 |            |                   |
| 2.00pm                         |              |               |                    |                 |            |                   |
| 3.00pm                         |              |               |                    |                 |            |                   |
| 4.00pm                         |              |               |                    |                 |            |                   |
| 5.00pm                         |              |               |                    |                 |            |                   |

PROJECT NAME: SUPPLY ,INSTALLATION, TESTING & COMMISSIONING OF EFFLUENT TREATMENT PLANT

PROJECT CAPACITY: 500LPH ETP PLANT.

CLIENT : KISHAN ACCUMULATORS LTD.

ADDRESS : UZIRPARA, BAKULTALA, NARAIL SADAR, NARAIL, BANGLADESH.

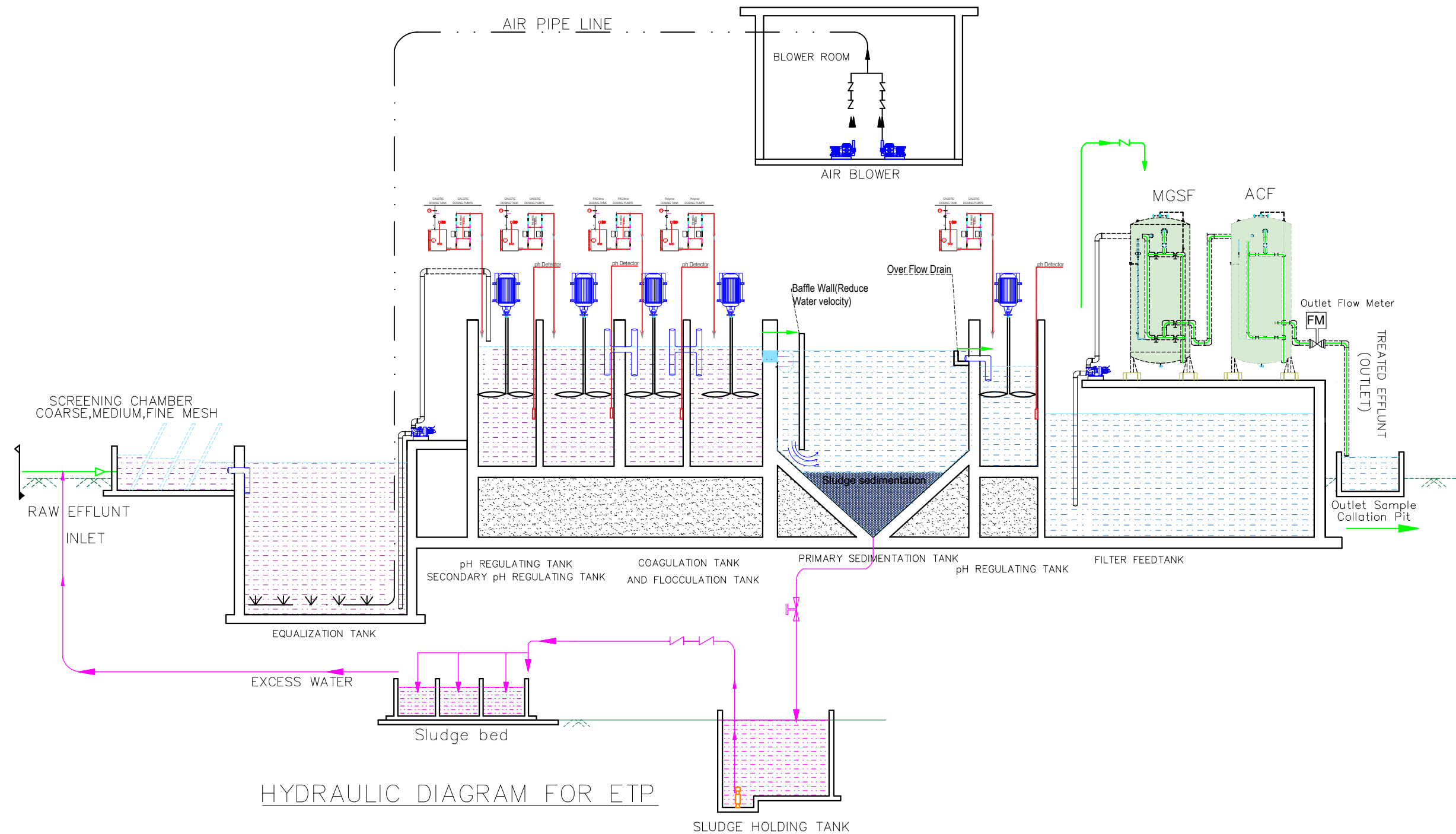
AGREEMENT WITH: EPL ENGINEERING .

Address: House:31(Lavel-5),Road:01,Uttara-09, Dhaka-1230  
01829907307

Date of Submission:-18<sup>th</sup> June,2026

FILE NO : 02-DW-01

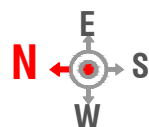
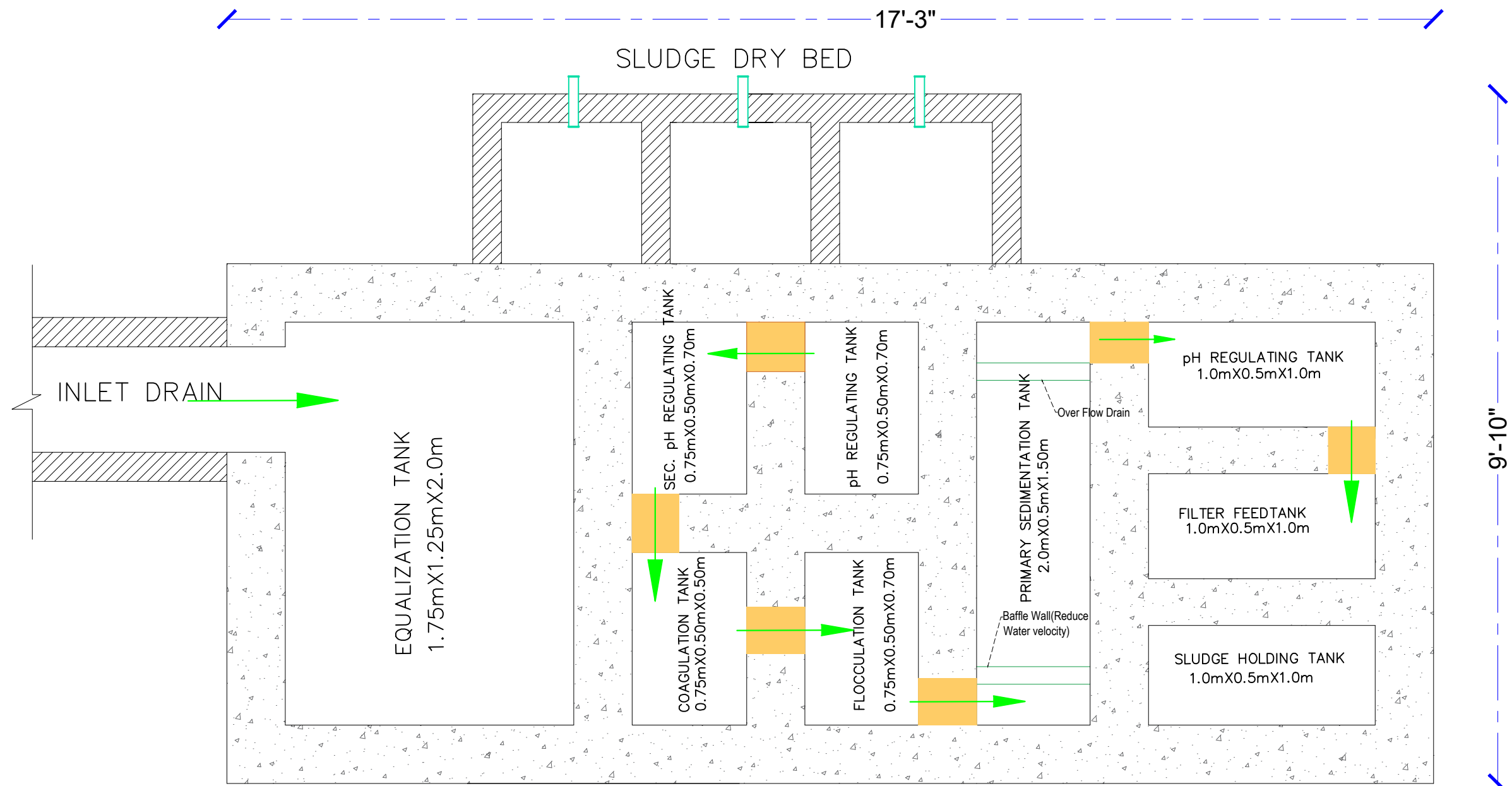
**KISHAN ACCUMULATORS LTD.**  
**EFFLUENT TREATMENT PLANT (CAPACITY=0.50M<sup>3</sup>/HR)**  
**CONSULTANT :EPL ENGINEERING.**



HYDRAULIC DIAGRAM FOR ETP

| NAME OF PROJECT :        | LOCATION :                                                     | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                               | CAD BY :                                                                       | SCALE :  | DRAWING TITLE :   | OWNER'S SIGNATURE : | SHEET NO: |
|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------|-------------------|---------------------|-----------|
| EFFLUENT TREATMENT PLANT | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-34-43101 | Md.Shahidul Hassan<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | HYDRAULIC DIAGRAM |                     | A/01      |
| CLIENT:                  | KISHAN ACCUMULATORS LTD.                                       |                                                                   |                                                          |                                                                                                                     |                                                                                |          |                   |                     |           |

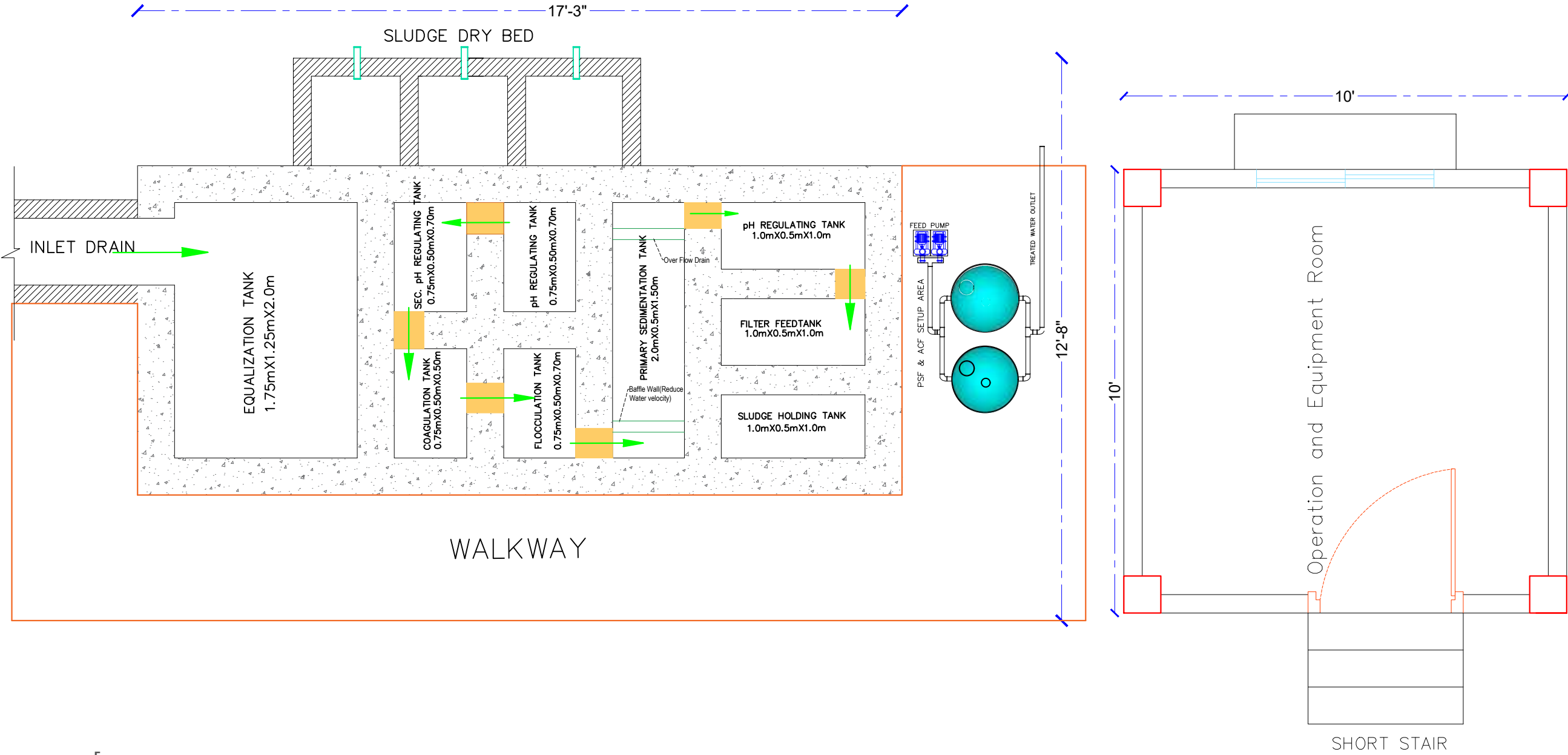
KISHAN ACCUMULATORS LTD.  
EFFLUENT TREATMENT PLANT (CAPACITY=0.50M<sup>3</sup>/HR)  
CONSULTANT :EPL ENGINEERING.



ETP LAYOUT PLAN(BELOW GL)  
REQUIRED LAND AREA—300Sq.Feet

|                   |                          |                                                                |                                                                   |                                                          |                                                                                                                     |                                                                               |          |                              |                     |           |
|-------------------|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------|------------------------------|---------------------|-----------|
| NAME OF PROJECT : | EFFLUENT TREATMENT PLANT | LOCATION :                                                     | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                               | CAD BY :                                                                      | SCALE :  | DRAWING TITLE :              | OWNER'S SIGNATURE : | SHEET NO: |
| CLIENT:           | KISHAN ACCUMULATORS LTD. | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-34-43101 | Md.Shahidul Hassn<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | ETP LAYOUT<br>PLAN(BELOW GL) |                     | A/02      |

KISHAN ACCUMULATORS LTD.  
EFFLUENT TREATMENT PLANT (CAPACITY=0.50M<sup>3</sup>/HR)  
CONSULTANT :EPL ENGINEERING.



ETP LAYOUT PLAN (ABOVE GL)  
REQUIRED LAND AREA – 300 Sq. Feet

| NAME OF PROJECT :        | LOCATION :                                                      | CONSULTANT BY :                                                       | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                               | CAD BY :                                                                      | SCALE :  | DRAWING TITLE :               | OWNER'S SIGNATURE : | SHEET NO.: |
|--------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------|-------------------------------|---------------------|------------|
| EFFLUENT TREATMENT PLANT | Address: Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31, ROAD#01, SECTOR#09, UTTARA, DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-44-43101 | Md.Shahidul Hassn<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | ETP LAYOUT<br>PLAN (BELOW GL) |                     | A/03       |
| CLIENT:                  | KISHAN ACCUMULATORS LTD.                                        |                                                                       |                                                          |                                                                                                                     |                                                                               |          |                               |                     |            |

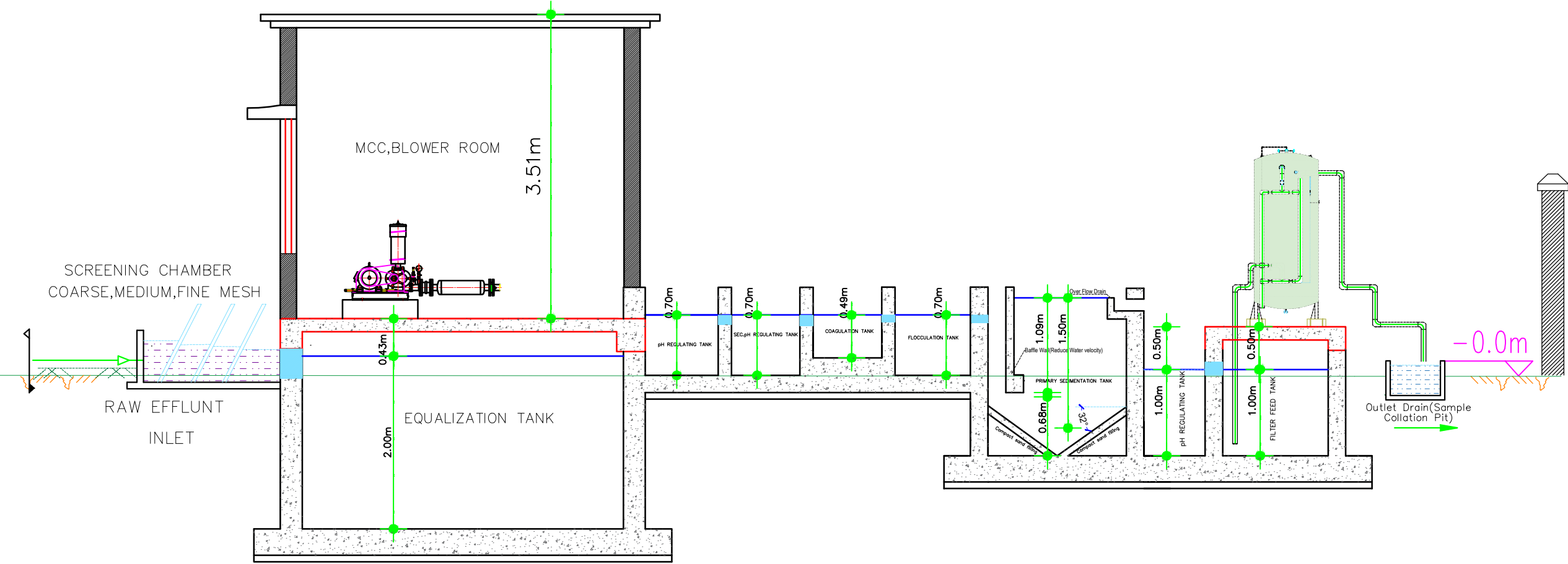
# KISHAN ACCUMULATORS LTD.

## EFFLUENT TREATMENT PLANT (CAPACITY=10.0M<sup>3</sup>/HR)

### CONSULTANT :EPL ENGINEERING.

| DETAILS OF TANKS / UNITS |                                               |                                                               |                                                         |                             |        |
|--------------------------|-----------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------|-----------------------------|--------|
| SL.NO                    | DESCRIPTION                                   | DIMENSIONS                                                    | CAPACITY<br>(cum)                                       | HYDRAULIC<br>RETENTION TIME | M.O.C. |
| 01                       | SCREEN CHAMBER                                | 1.0mX0.25mX0.25m+F.B-0.250M                                   | 0.062CUM                                                | 0hr7min                     | RCC    |
| 02                       | EQUALIZATION TANK                             | 1.75mX1.25mX2.0m+F.B-0.250M                                   | 4.375CUM                                                | 8hr45min                    | RCC    |
| 03                       | pH REGULATING TANK                            | 0.75mX0.50mX0.70m+F.B-0.250M                                  | 0.25CUM                                                 | 0hr30min                    | RCC    |
| 04                       | SECONDARY pH REGULATING TANK                  | 0.75mX0.50mX0.70m+F.B-0.250M                                  | 0.25CUM                                                 | 0hr30min                    | RCC    |
| 05                       | COAGULATION TANK                              | 0.75mX0.50mX0.50m+F.B-0.250M                                  | 0.180CUM                                                | 0hr20min                    | RCC    |
| 05                       | FLOCCULATION TANK                             | 0.75mX0.50mX0.70m+F.B-0.250M                                  | 0.25CUM                                                 | 0hr30min                    | RCC    |
| 06                       | SLUDGE HOLDING TANK                           | 1.0mX0.5mX1.0m+F.B-0.50M                                      | 0.50CUM                                                 | 1hr0min                     | RCC    |
| 07                       | PRIMARY SEDIMENTATION TANK<br>Plain Clarifier | 2.0mX0.5mX1.50m+F.B-0.250M<br>Surface Area-1.00m <sup>2</sup> | 1.50CUM<br>SOR- 0.500m <sup>3</sup> /m <sup>2</sup> /hr | 3hr0min                     | RCC    |
| 08                       | pH REGULATING TANK                            | 1.0mX0.5mX0.50m+F.B-0.750M                                    | 0.250CUM                                                | 1hr0min                     | RCC    |
| 09                       | FILTER FEED TANK                              | 1.0mX0.5mX1.0m+F.B-0.50M                                      | 0.50CUM                                                 | 0hr57min                    | RCC    |
| 10                       | MGSF & ACF                                    | Dia-0.25mXHight-1.2m=0.058CUM                                 |                                                         |                             | FRP/MS |
| 11                       | SLUDGE DRYING BED-1,2,3,4                     | 0.60mX0.60mX0.60m+F.B-0.250M                                  | 0.219CUM                                                |                             | RCC    |

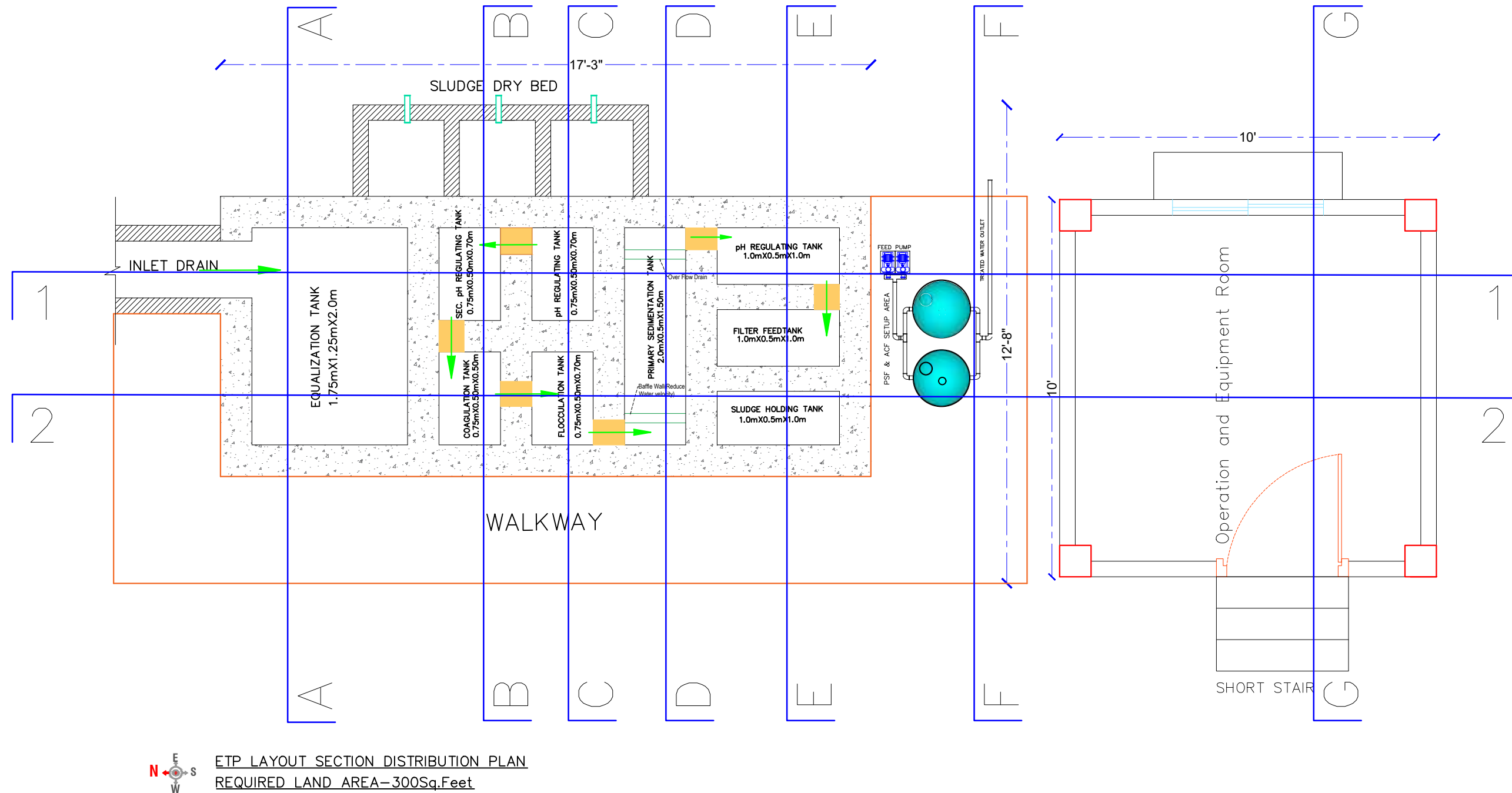
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|-------------------|--------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|---------------------|-----------|
| NAME OF PROJECT : | EFFLUENT TREATMENT PLANT | LOCATION :                                                        | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                                                                                                               | DESIGN AND CHECK BY :                                                                                                                                                                                       | CAD BY :                                                                                                                                                              | SCALE :  | DRAWING TITLE :  | OWNER'S SIGNATURE : | SHEET NO: |
| CLIENT:           | KISHAN ACCUMULATORS LTD. | Address:Uzirpara, Bakultala, Narail<br>Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | <br>ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | <br>Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-3443101 | <br>Md.Shahidul Hasn<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | DETAILS OF TANKS |                     | A/04      |



ETP TANK ELEVATION

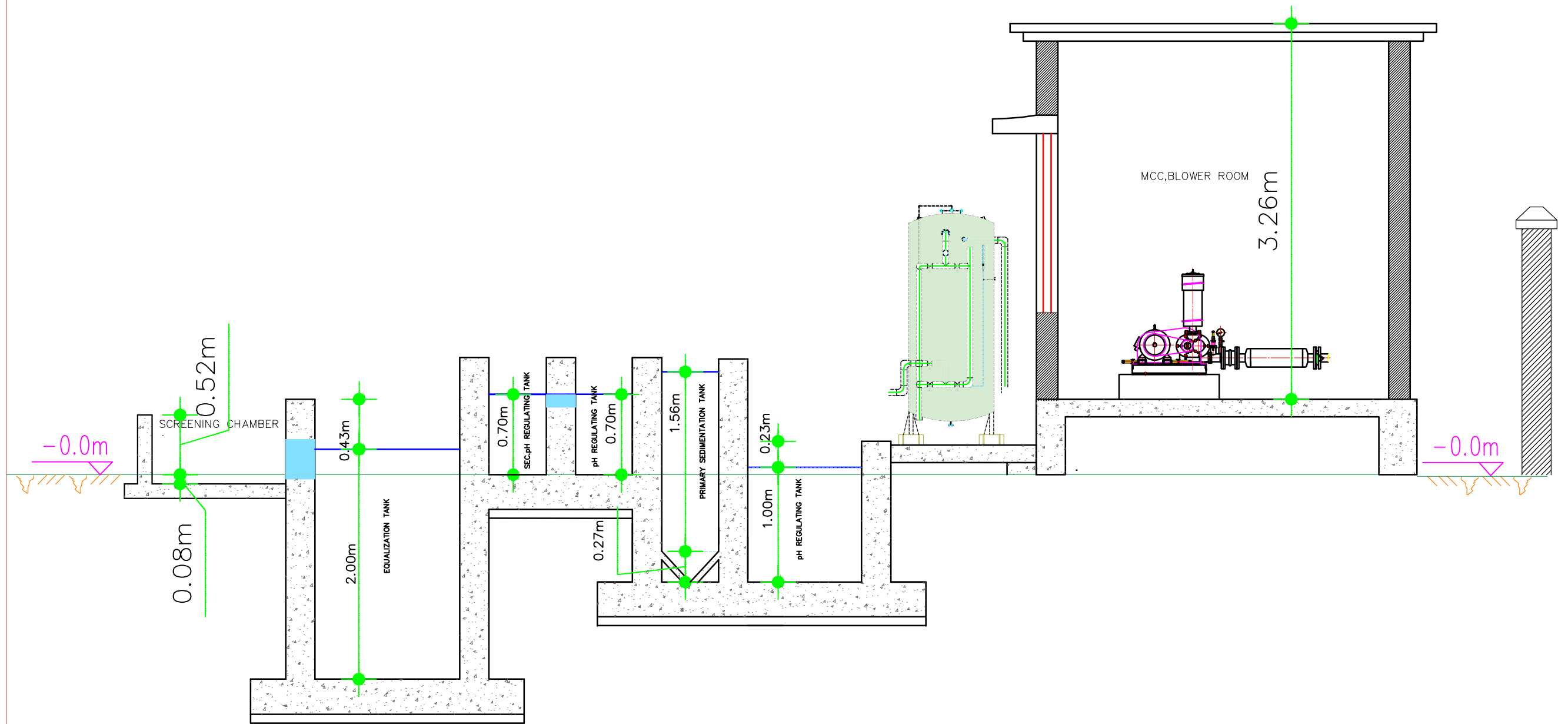
|                   |                          |                                                                |                                                                                  |                                                                          |                                                                                                                                      |                                                                                               |          |                    |                     |            |
|-------------------|--------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------|--------------------|---------------------|------------|
| NAME OF PROJECT : | EFFLUENT TREATMENT PLANT | LOCATION :                                                     | CONSULTANT BY :                                                                  | PROCESS DESIGN BY :                                                      | DESIGN AND CHECK BY :                                                                                                                | CAD BY :                                                                                      | SCALE :  | DRAWING TITLE :    | OWNER'S SIGNATURE : | SHEET NO.: |
| CLIENT:           | KISHAN ACCUMULATORS LTD. | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br><small>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230</small> | ABDUL GONI MIA<br><small>B.Sc in honour's<br/>M. Sc in chemistry</small> | Engr. Husain Md.Sajib<br><small>B.Sc. in Civil Engineering,<br/>M.Engg. in Environmental Engineering (BUET)<br/>IES-36-43101</small> | Md.Shahidul Hassn<br><small>B.Sc. Engr.(CIVIL).<br/>MS in Environmental Sciences (JU)</small> | AS SHOWN | ETP TANK ELEVATION |                     | A/05       |

KISHAN ACCUMULATORS LTD.  
EFFLUENT TREATMENT PLANT (CAPACITY=0.50M<sup>3</sup>/HR)  
CONSULTANT :EPL ENGINEERING.



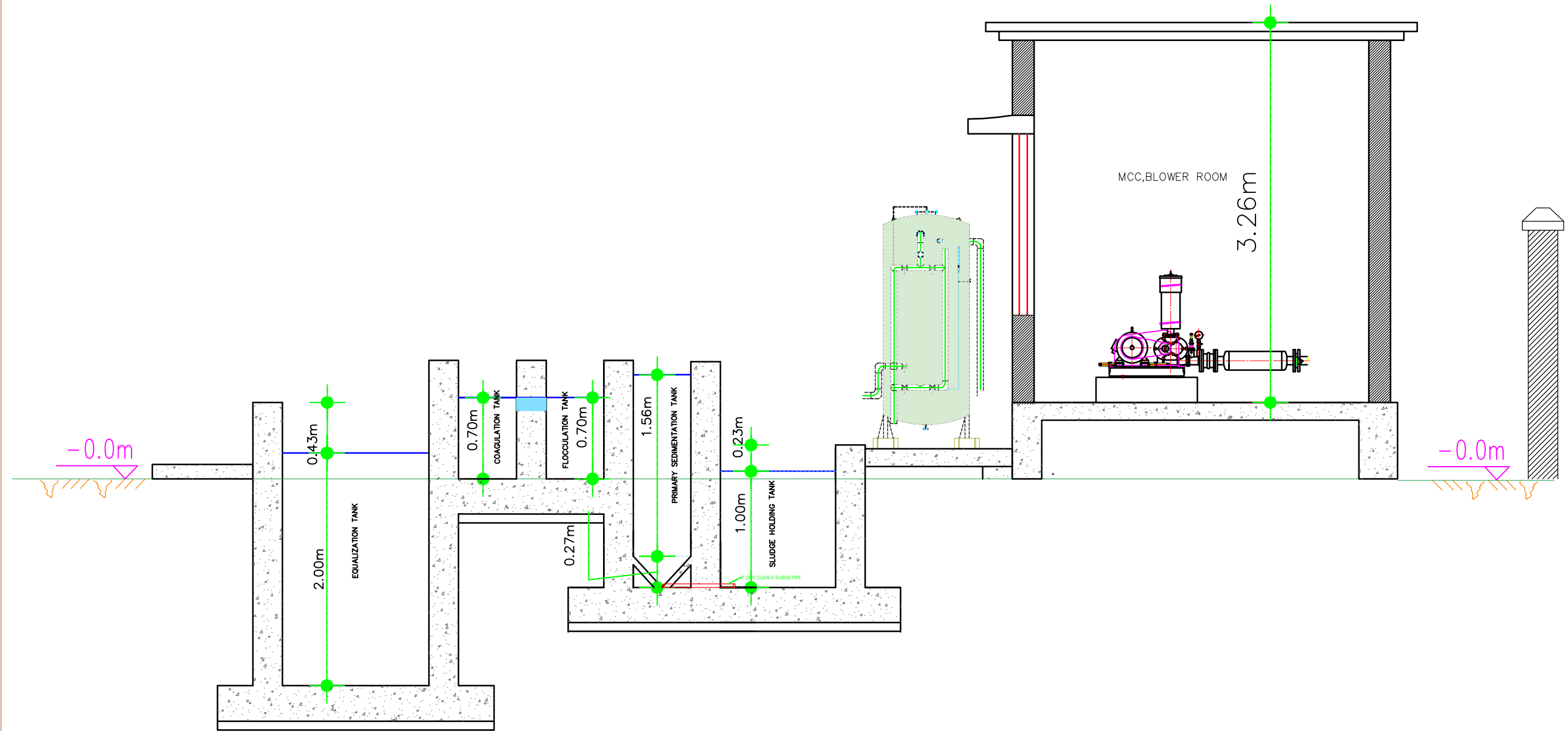
ETP LAYOUT SECTION DISTRIBUTION PLAN  
REQUIRED LAND AREA-300Sq.Feet

| NAME OF PROJECT :        | LOCATION :                                                     | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                               | CAD BY :                                                                       | SCALE :  | DRAWING TITLE :                         | OWNER'S SIGNATURE : | SHEET NO: |
|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------|-----------------------------------------|---------------------|-----------|
| EFFLUENT TREATMENT PLANT | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-44-43101 | Md.Shahidul Hassan<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | ETP LAYOUT SECTION<br>DISTRIBUTION PLAN |                     | A/06      |
| CLIENT:                  | KISHAN ACCUMULATORS LTD.                                       |                                                                   |                                                          |                                                                                                                     |                                                                                |          |                                         |                     |           |



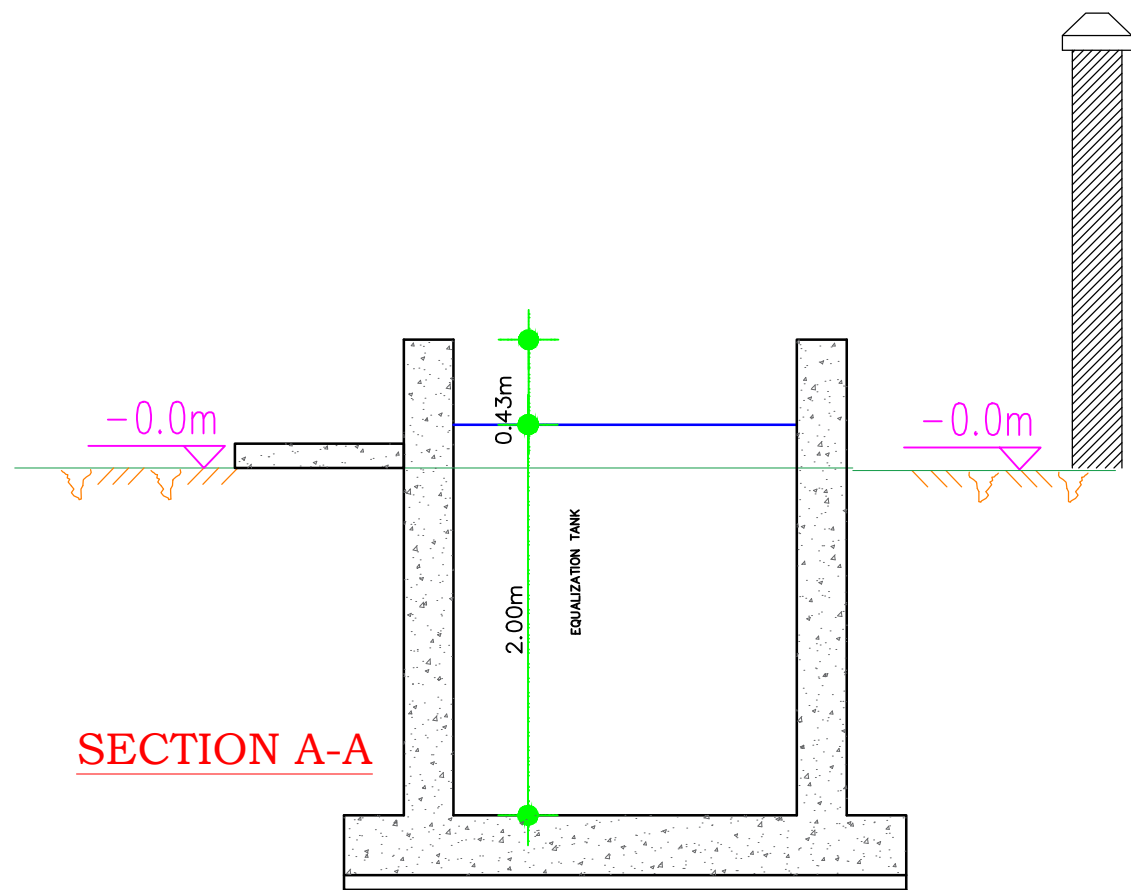
**SECTION 01-01**

| NAME OF PROJECT :        | LOCATION :                                                     | CONSULTANT BY :                                                                 | PROCESS DESIGN BY :                                                                                                                               | DESIGN AND CHECK BY :                                                                                                                                                                                        | CAD BY :                                                                                                                                                               | SCALE :  | DRAWING TITLE : | OWNER'S SIGNATURE : | SHEET NO: |
|--------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|---------------------|-----------|
| EFFLUENT TREATMENT PLANT | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br><small>HOUSE#1,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230</small> | <br>ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | <br>Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-44-43101 | <br>Md.Shahidul Hassn<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | SECTION_01-01   |                     | A/07      |
| CLIENT:                  | KISHAN ACCUMULATORS LTD.                                       |                                                                                 |                                                                                                                                                   |                                                                                                                                                                                                              |                                                                                                                                                                        |          |                 |                     |           |

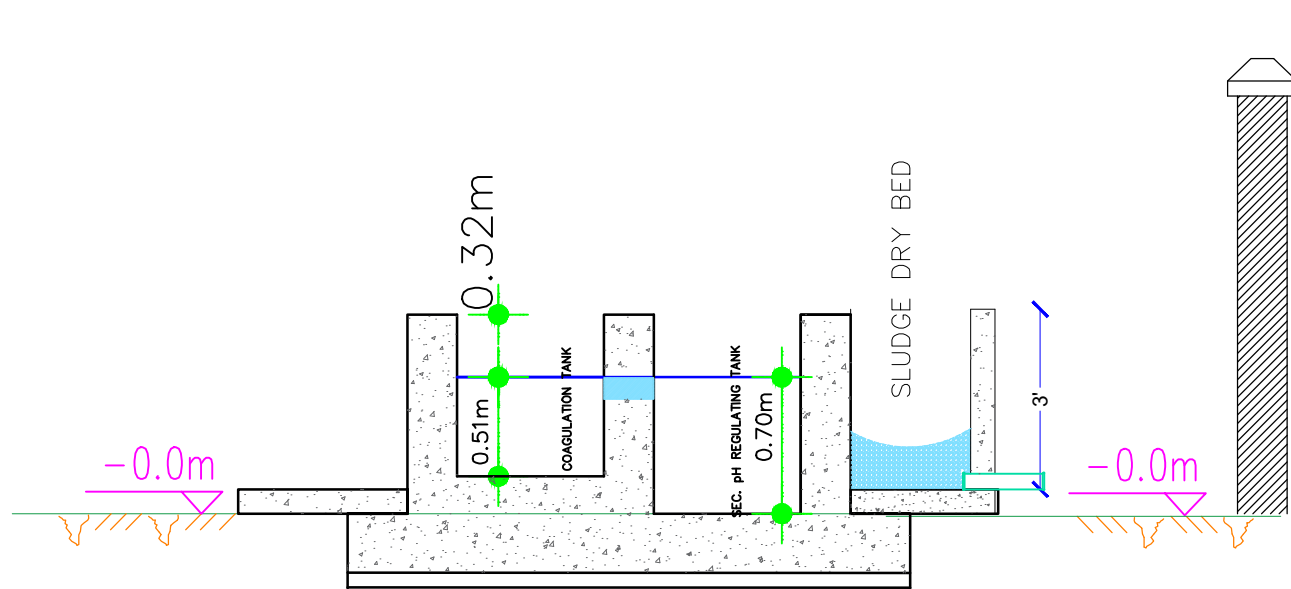


**SECTION 02-02**

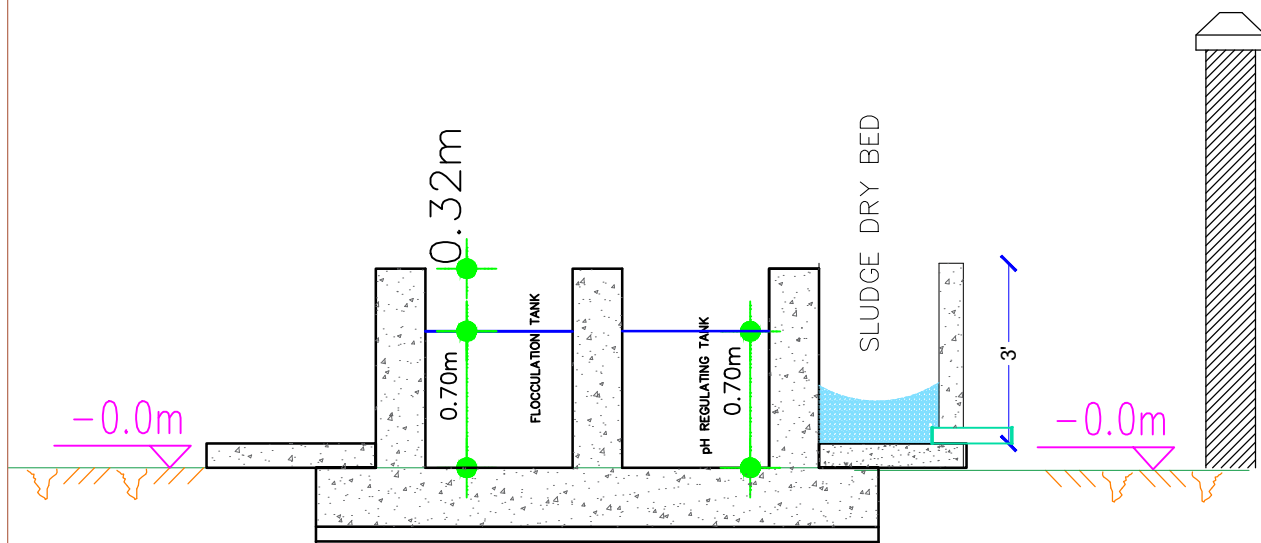
| NAME OF PROJECT :        | LOCATION :                                                     | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                              | CAD BY :                                                                       | SCALE :  | DRAWING TITLE : | OWNER'S SIGNATURE : | SHEET NO: |
|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------|-----------------|---------------------|-----------|
| EFFLUENT TREATMENT PLANT | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-4443101 | Md.Shahidul Hassan<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | SECTION_02-02   |                     | A/08      |
| CLIENT:                  | KISHAN ACCUMULATORS LTD.                                       |                                                                   |                                                          |                                                                                                                    |                                                                                |          |                 |                     |           |



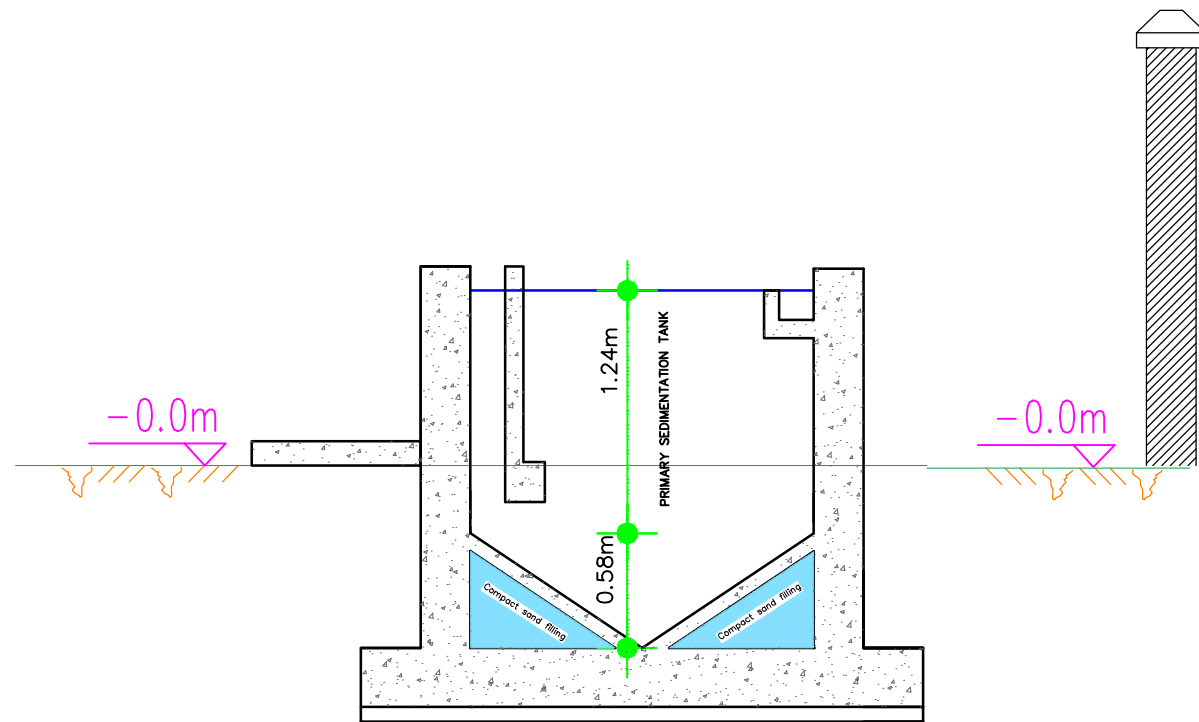
SECTION A-A



SECTION B-B

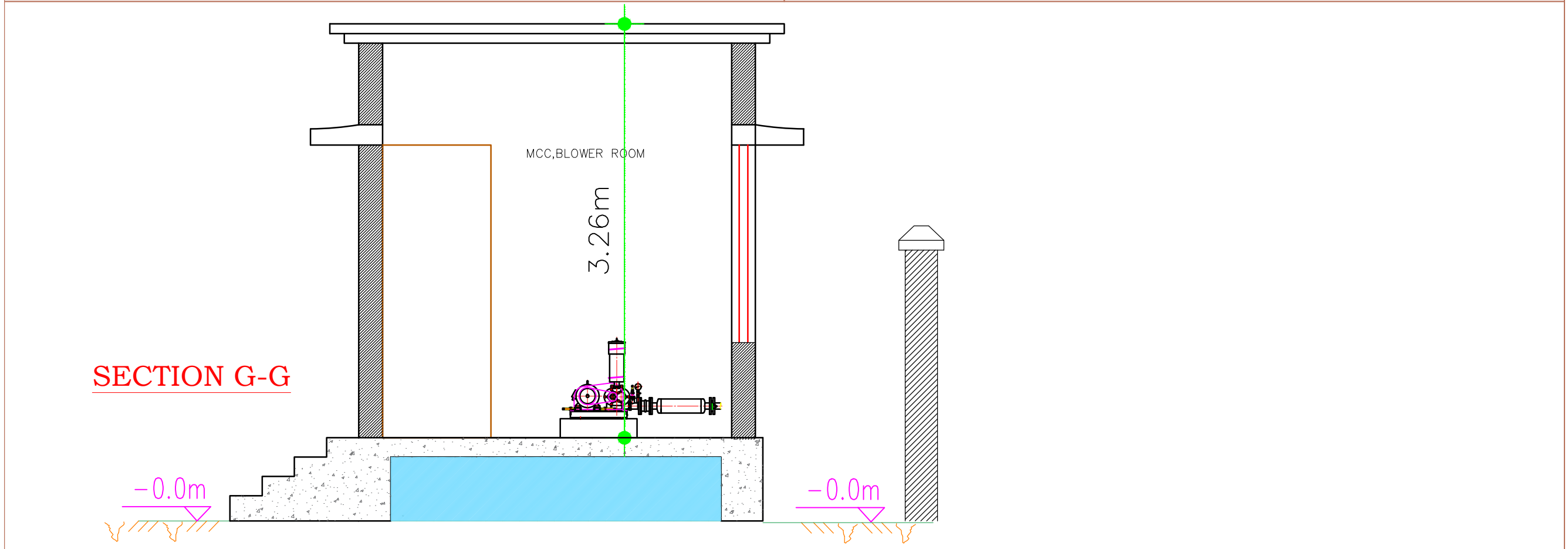
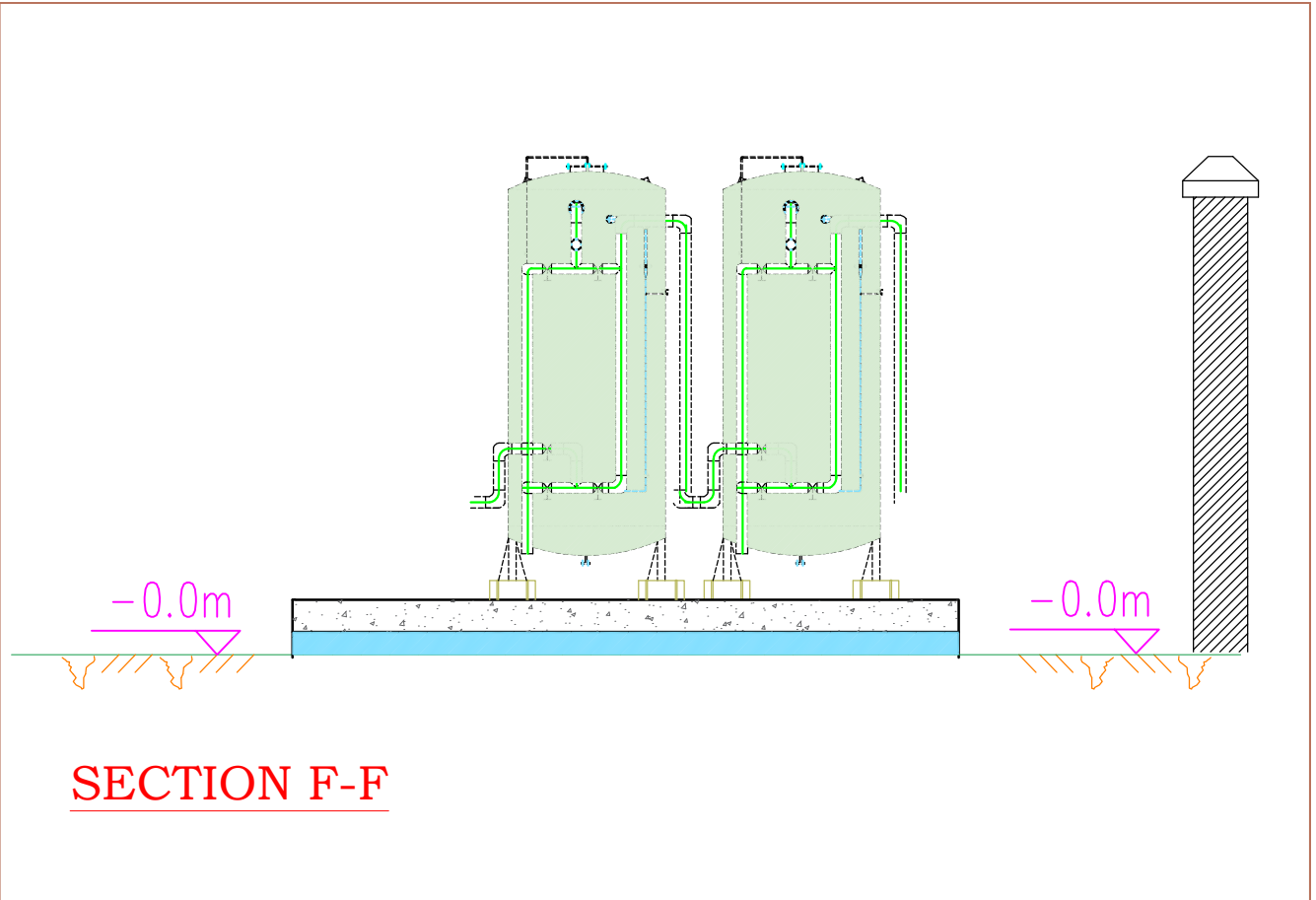
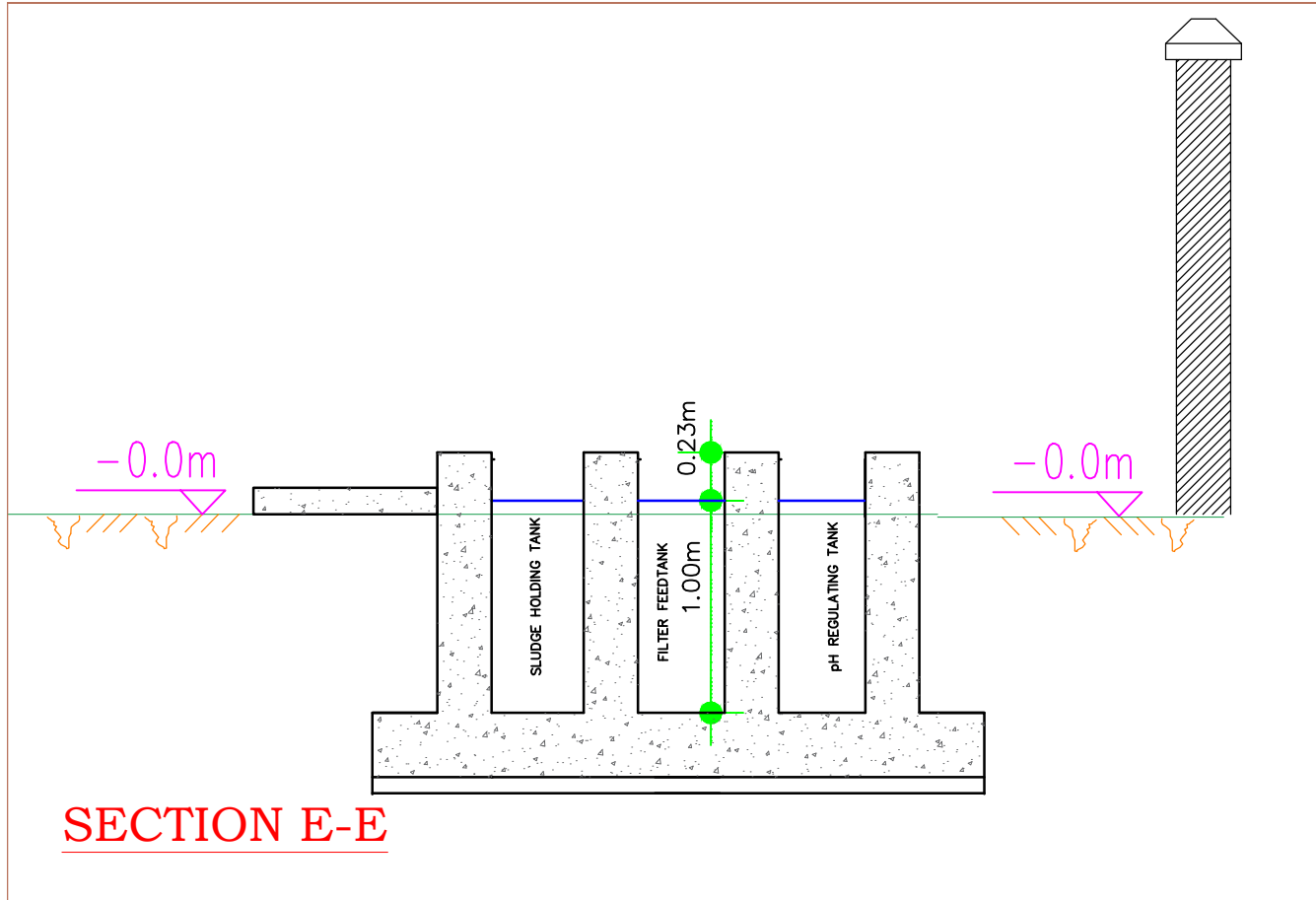


SECTION C-C

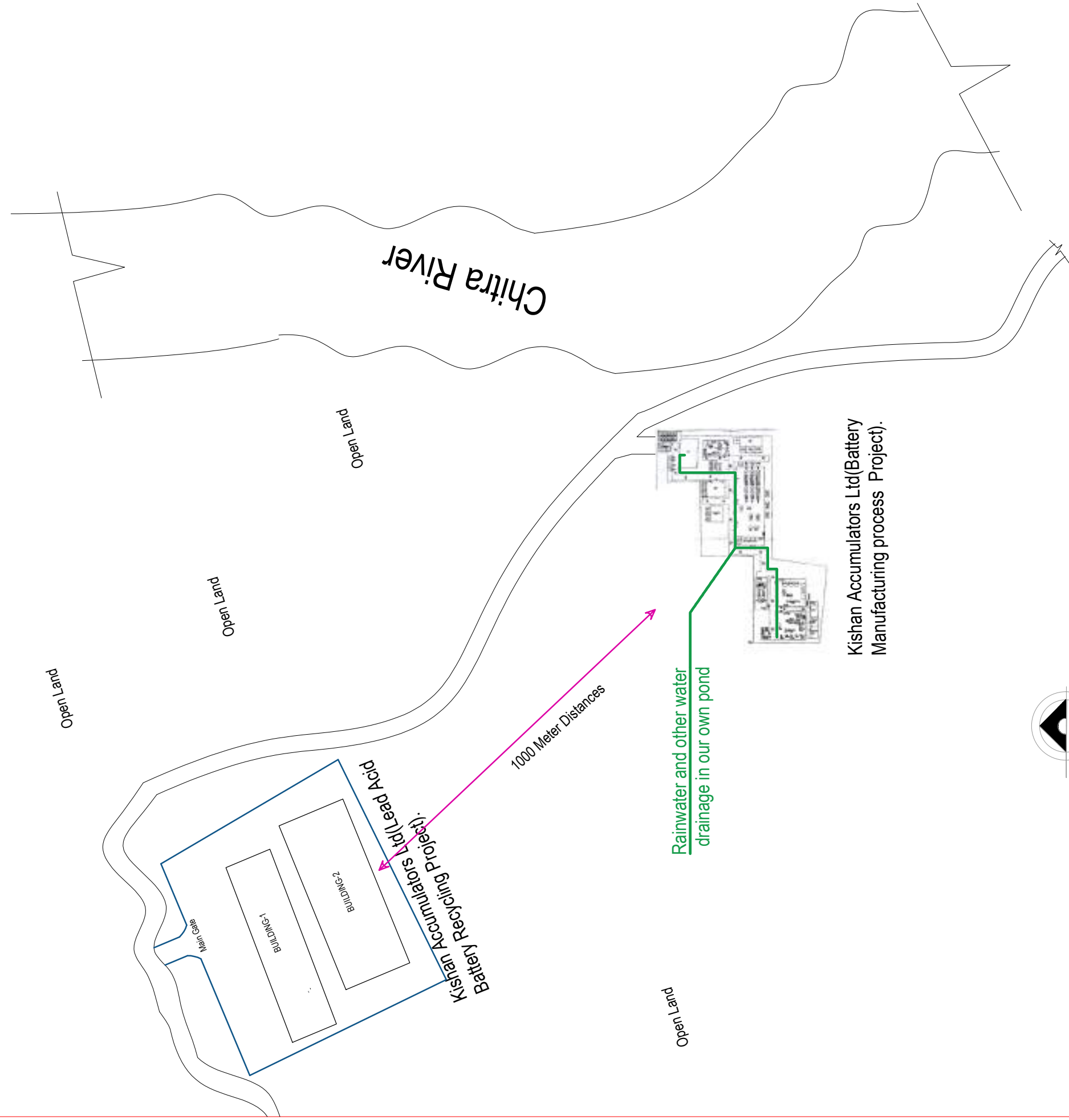


SECTION D-D

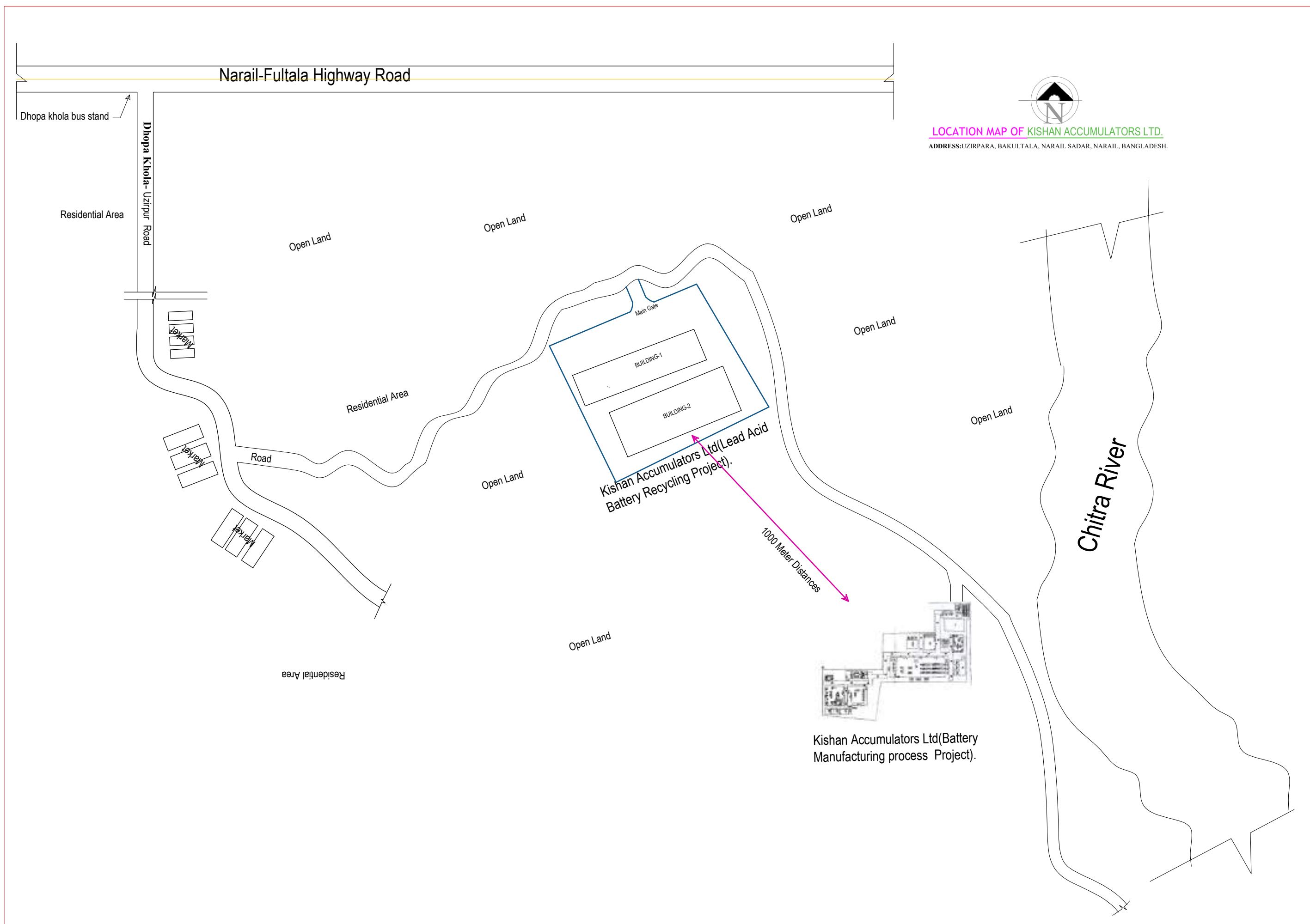
| NAME OF PROJECT :        | LOCATION :                                                     | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                             | CAD BY :                                                                      | SCALE :  | DRAWING TITLE :                                          | OWNER'S SIGNATURE : | SHEET NO: |
|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------|----------------------------------------------------------|---------------------|-----------|
| EFFLUENT TREATMENT PLANT | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-443101 | Md.Shahidul Hassn<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | SECTION A-A<br>SECTION B-B<br>SECTION C-C<br>SECTION D-D |                     | A/09      |
| CLIENT:                  | KISHAN ACCUMULATORS LTD.                                       |                                                                   |                                                          |                                                                                                                   |                                                                               |          |                                                          |                     |           |



| NAME OF PROJECT :        | LOCATION :                                                     | CONSULTANT BY :                                                   | PROCESS DESIGN BY :                                      | DESIGN AND CHECK BY :                                                                                               | CAD BY :                                                                      | SCALE :  | DRAWING TITLE :                           | OWNER'S SIGNATURE : | SHEET NO.: |
|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------|-------------------------------------------|---------------------|------------|
| EFFLUENT TREATMENT PLANT | Address:Uzirpara, Bakultala, Narail Sadar, Narail, Bangladesh. | EPL ENGINEERING .<br>HOUSE#31,ROAD#01,SECTOR#09,UTTARA,DHAKA-1230 | ABDUL GONI MIA<br>B.Sc in honour's<br>M. Sc in chemistry | Engr. Husain Md.Sajib<br>B.Sc. in Civil Engineering,<br>M.Engg. in Environmental Engineering (BUET)<br>IES-44-43101 | Md.Shahidul Hassn<br>B.Sc. Engr.(CIVIL).<br>MS in Environmental Sciences (JU) | AS SHOWN | SECTION E-E<br>SECTION F-F<br>SECTION G-G |                     | A/10       |
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**DRAINAGE LAYOUT MAP OF KISHAN ACCUMULATORS LTD.**  
**ADDRESS:UZIRPARA, BAKULTALA, NARAIL SADAR, NARAIL, BANGLADESH.**



LOCATION MAP OF KISHAN ACCUMULATORS LTD.

ADDRESS:UZIRPARA, BAKULTALA, NARAIL SADAR, NARAIL, BANGLADESH.

***Annexure V***

***Air Pollution Control System (APCS) Design***

*APCS (ATP) of the Project*

## Sources of Air Pollution

The lead-acid battery manufacturing process involves several production sections that may generate air pollutants during operation.

**Grid Casting Section:** Lead ingots are melted in furnaces and cast into battery grids. During the lead melting and casting process, lead fumes and smoke may be generated and released into the workplace environment if not properly controlled.

**Battery Assembly Section:** During battery assembly, lead components are joined using lead welding processes. This operation may generate lead fumes. In addition, handling and assembly of battery plates may result in the release of small quantities of lead dust due to abrasion and material loss.

**Lead Powder Filling Section:** Lead dust may be generated during the filling of lead powder into battery tubulars and other lead-handling operations. Without adequate dust collection systems, these fine particles may become airborne.

**Plate Formation and Charging Section:** During battery formation and charging, sulfuric acid-containing electrolyte is used. The electrochemical charging process may generate acid mist or acid fog, which can be released into the surrounding air.

Therefore, the primary air pollutants associated with the proposed lead-acid battery manufacturing facility are lead fumes (lead smoke), lead dust, and acid mist (acid fog). Appropriate air pollution control measures will be incorporated into the facility design to minimize emissions and ensure compliance with applicable environmental standards.

## **Air Treatment Plant (ATP)**

The air pollutants generated from the manufacturing processes of Kishan Accumulators Ltd. will be controlled through a dedicated Air Treatment Plant (ATP) designed to capture and treat lead fumes, lead dust, and acid mist before their release into the atmosphere. The ATP will incorporate a combination of wet scrubbing and dry scrubbing technologies to ensure compliance with applicable environmental standards and occupational health requirements.

### **Wet Scrubber System:**

Wet scrubbers will be installed to control acid mist and lead fumes generated from the grid casting and plate formation/charging sections. In this system, contaminated air passes through a scrubbing chamber where it comes into contact with a liquid medium, effectively removing particulate matter, lead-containing fumes, and acidic contaminants from the exhaust stream before discharge.

### **Dry Scrubber System:**

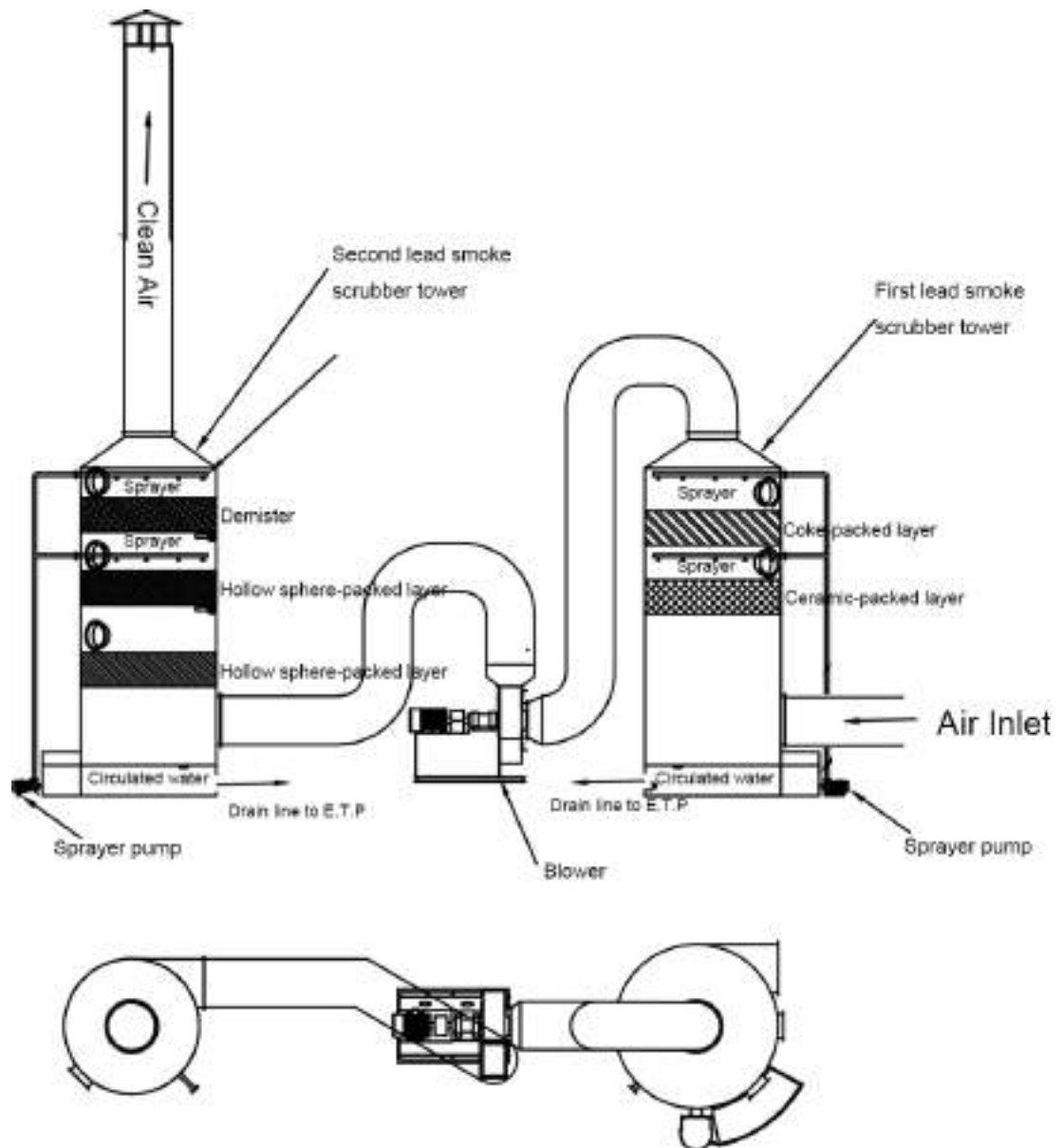
Dry scrubbers will be used to control lead dust generated from the battery assembly and lead powder handling sections. These systems operate by passing contaminated air through filtration and dry reagent-based treatment units that capture fine lead particles and other airborne contaminants. The collected dust will be safely handled and managed as hazardous waste in accordance with environmental regulations.

To effectively manage air emissions from different production areas, two (2) wet scrubbers will be installed for the plate formation and charging section, one (1) wet scrubber will be installed for the grid casting section, and two (2) dry scrubbers will be installed for the battery assembly and lead powder filling sections. The proposed ATP system will significantly reduce emissions of lead fumes, lead dust, and acid mist, thereby protecting worker health and minimizing impacts on the surrounding environment.

## AIR TREATMENT PLANT (ATP)

### Lead Smoke from Grinding casting and battery assembly section

ATP Process Flow Diagram

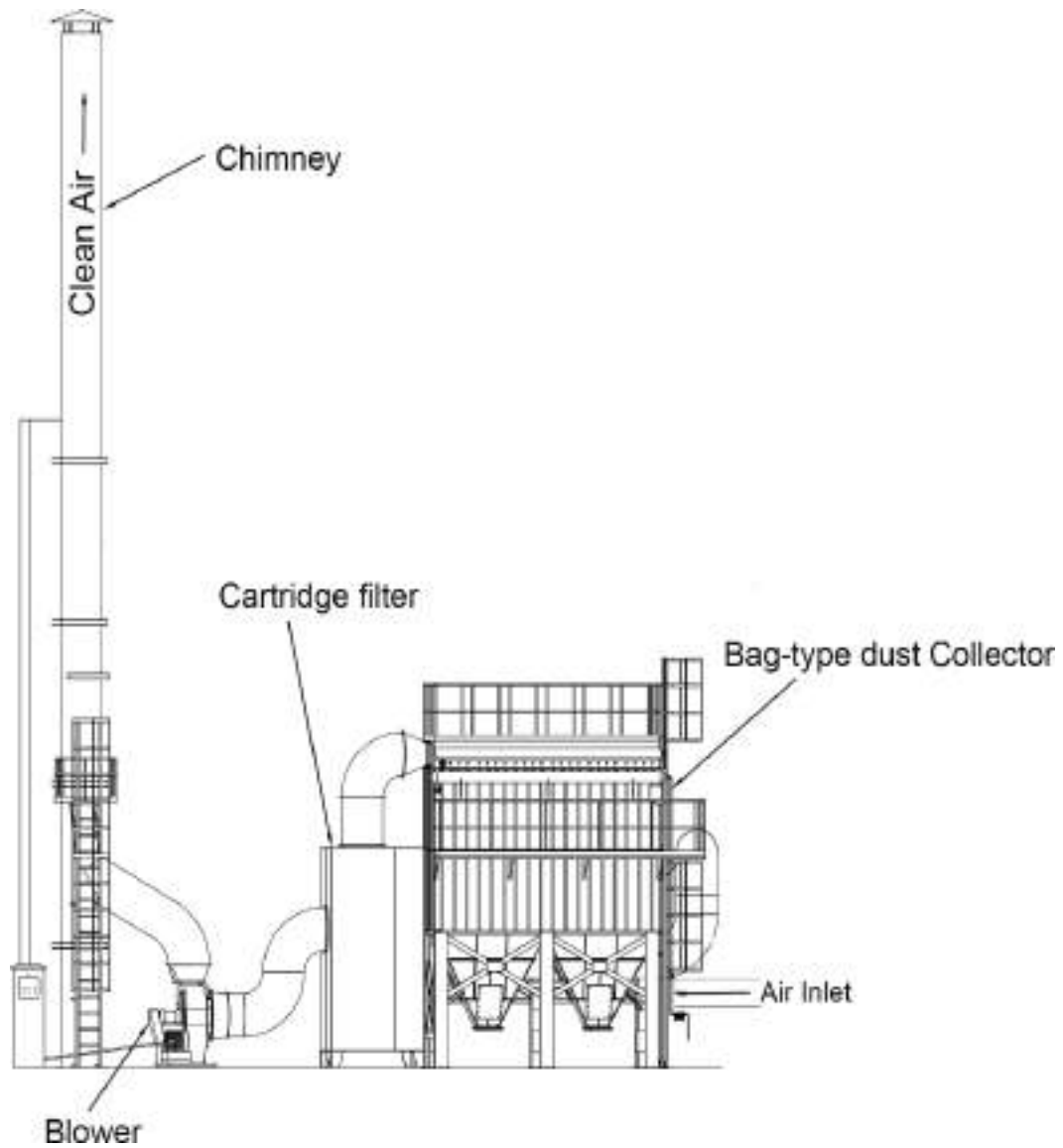


This system has two lead smoke scrubber towers, each divided into different stages.

The inlet of lead smoke containing air adopts a circular inlet, and large particles of dust are swept by first stage air and throw it into the bottom tank. In the lead smoke scrubber towers, particulate-laden air passes into a chamber where it contacts liquid spray produced by spray nozzles. Towers are placed in vertically waste gas flow paths. The liquid spray is directed counter to the gas flow, in the same direction as the gas flow, or perpendicular to the gas flow. The gas flow enters at bottom of the tower and flows upward. Water sprays downward from nozzles. Water droplets capture particles suspended in the gas flow through impaction, interception and diffusion. The towers rely primarily on particle collection by impaction; they have high collection efficiencies for coarse PM. There are some different packed bed layers containing packing materials such as coke, ceramic and hollow sphere in these lead smoke scrubber towers. Water is sprayed across the top of the packed layer and trickles through the packing materials. Gas enters packed layer and types of packing materials. They are able to reduce odor and pollutant gases to low residual concentrations. The cleaned gas stream passes through a mist eliminator near to top where entrained moisture is removed prior to discharge by the chimney. Scrubbing liquor (waste water) is collected at bottom and discharged to the drain line connected to the ETP. The water will be recycled through the ETP.

**AIR TREATMENT PLANT (ATP) -Lead dust from battery assembly  
and lead powder filling section**

ATP Process Flow Diagram



The system of ATP for lead dust is dry scrubber system. It mainly includes bag-type dust collector, cartridge filter, blower and chimney.

**1. Bag-Type Dust Collector:** Bag-Type Dust Collector utilizes the filtering effect of fiber fabric to filter dusty gases. When the dusty gas passes through the bag, the dust is trapped on the surface of the bag, and the purified gas side is discharged through the bag. As dust accumulates on the surface of the bag, regular cleaning is required to ensure the normal operation of the dust collector.

**2. Cartridge Filter:** The gas will go inside the cartridge filter after the Bag-Type Dust Collector. Cartridge filter dust collector composed a cartridge filter as a filtering element. After the dusty gas enters the dust collector hopper, due to the sudden expansion of the airflow cross-section and the effect of the airflow distribution plate, some coarse particles in the airflow settle in the hopper under the action of dynamic and inertial forces; After the dust particles with fine particle size and low density enter the dust filter chamber, they deposit on the surface of the filter material through a combination of Brownian diffusion and screening effects. The purified gas enters the clean air chamber and is discharged through the chimney and blower.

**3. Blower:** The blower is another component that the main function is air flow. The blower extracts air from the dust collector and flows to the gas chimney.

**4. Chimney:** The tall vertical chimney is in the system. The clean air will be discharged by the chimney.

## **AIR TREATMENT PLANT (ATP) -Acid fog from Plate formation and charging section**

The system of ATP for acid fog is wet scrubber system. We also call it as spray type scrubber system. It mainly includes spray tower, FRP Blower and the chimney. Each spray tower can connect with two charging lines depend on the air volume of the blower. The principle is same as the ATP of lead smoke so we will not explain again here.

ATP Process Flow Diagram (Spray type scrubber system)

