QUALITY MANAGEMENT SYSTEM PROCEDURES (QMSP)

PERFACT ENVIRO SOLUTIONS PVT LTD (PESPL)

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Procedures to comply with NABET Scheme Version 3, June 2015, and amendments up to December 2024.

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About Quality Management System Procedure (QMSP)

This Document is specifically prepared as per the NABET Scheme Version 3 dated 5th June 2015 and its subsequent amendments till 5th December 2022.

This alongside the various policies, circulars given by Human Resources Department (HRD), Management system procedures (MSP) - which covers other procedures and requirements of IMS Management which are not covered by the NABET Scheme; form the basis of IMS implementation in PESPL.

Employees involved in EIA work of Perfact Envirosolutions Pvt Ltd are required to read, understand the Quality Policy and its requirements.

Moreover, all employees are mandated to undergo this management system procedure handbook prepared to ease the process of conducting EIA and its associated activities.

Any change in the procedure mentioned in the manual by Quality Manager and communicated to all via email and thereafter the updated practice is amended in procedures by the quality team from time to time, in all such cases, email is given by the quality team by all to review the updated MSP document.

Every reader is entrusted with complete confidentiality and trust with this document and any part of the document in whole or partial may not be used anywhere else without proper referencing, authorization, regularly and approval of the quality team. Any deviation found shall be considered a breach of trust and in turn a breach of the code of conduct.

If there are any issues, clarifications, or suggestions, please contact the quality team.

Perfact Enviro Solutions Pvt. Ltd. [PESPL] will follow the system which will have the following Management designated Structure.

Management system will be

1. Chairman
2. CEO
3. COO
4. Quality Manager
5. Advisers (Quality)
6. Directors
7. VPs
8. EIA Coordinators/FAEs/FAAs/Team members

This QMS System will be developed, updated by the Quality Manager who will be appointed by the CEO.

Prepared by: Quality Manager/Dy. Quality Manager

Reviewed and Approved by - CEO/COO

Note: This Document does not need signature (the same is electronically locked to avoid any changes, the document is controlled only in its location in PG QMS GDrive PESPL and otherwise considered uncontrolled).

Introduction

Perfact Enviro Solutions Pvt. Ltd. is a Private Limited Company, registered with the Registrar of Companies.

The company is headed by Mr Praveen Bhargava and Mrs. Rachna Bhargava, who are the Founder Directors of the company who have vast experience in the field of Environment Consulting, Environmental Science and Technology, about 32 years and 27 years respectively.

Perfact Enviro Solutions Pvt. Ltd. [PESPL] is a NABET: QCI accredited Consultant Organization providing different environmental solutions to various industries in securing Environmental Clearances, Consent orders, ETP/STP Design, Adequacy certification, Environmental Audit, Environmental Testing Services and any other environmental solutions.

In addition to its office at Delhi there are following regional offices:

- Gurugram
- Lucknow
- Chennai
- Gujarat

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Our Vision

"To become the premier firm that will provide Environmental Consultancy for sustainable, smart development with uncompromising and ecocentric values."

Our Mission

"To provide a platform for exceptional Environmental Professionals to Collaborate, Conjugate, Contribute towards advocating innovative solutions to our Clients to adopt sustainable methods and practices for contributing to the betterment of our "Only one earth".

Our Core Values

Quality of Work

Sustainability has no compromise and does the quality as well. We believe in the concept inculcated by our founders that "A job is done well only when it is done in the way it is to be done".

Integrity

We believe that integrity is the most important value that we can instill in our employees and it is essential that everyone involved with us has clear ideals and will operate with integrity.

Commitment to Environment

Our most important and most consequential work has always been towards growing, protecting, and sustaining the environment, and we believe that our unwavering and uncompromising commitment to reduce, avoid and stop any harm to the planet has been a cornerstone of the organization's working.

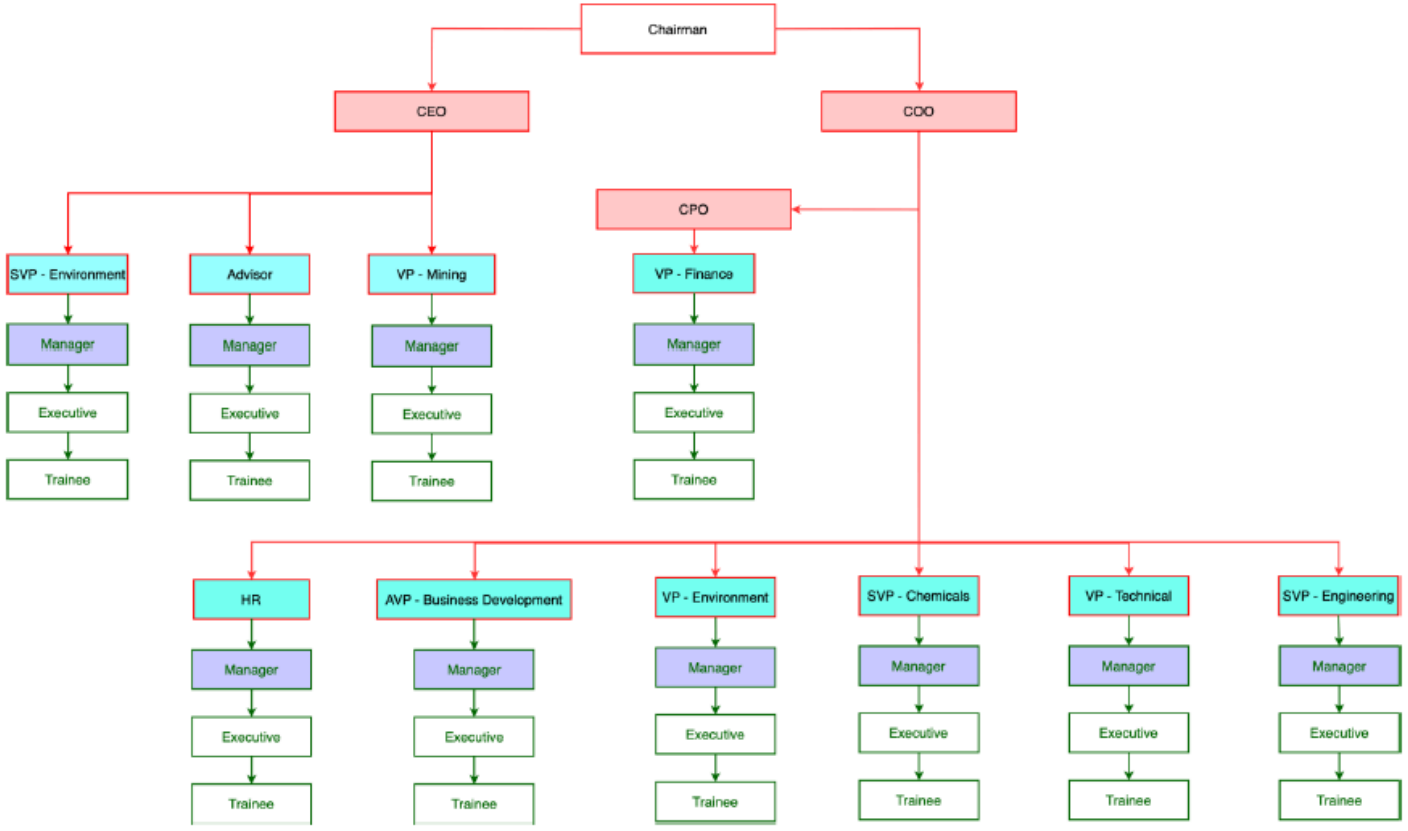
Responsibility & Accountability

One of the most important values that we impart to our employees and customers alike is the willingness to take responsibility and be accountable for our work, It is ingrained in the fabric
of our organization to accept your mistakes and mishaps if and when they happen and that we should have the inner strength to make them right.

Innovate and Never Imitate

We stay true to the fact that to be a leader is better than following the pack and we operate to ensure that we are the ones who innovate and are at the forefront of adopting all technological and policy changes to ensure that we are always the early bird.

ORGANIZATION CHART



ROLES AND RESPONSIBILITIES

S.No.	Title	Roles	Responsibilities
1	Chairman	Leader/EC/FAE	Responsible for the EIA work
2	CEO	Planner/EC/FAE	Responsible for execution of the Job by assigning appropriate resources and ensures quality of the Job done as well: responsible for realizing contractual fulfillment
3	COO	Chief Operating Officer (Technical)/EC/FAE	Responsible for Data extraction from the clients' input , dissemination of data and aligning it to the EIA preparation for Industrial Projects other than Infra development and allied sectors
4	Advisers/ VPs/ Quality Manager	Leaders in the systems	Framing up Quality standards from time to time wrt the statutory and NABET/MOEF/SEIAA/SEAC/ISO standards ; ensuring reliability of the EIA delivered
5	Experts/ Empanelled Experts	EC/FAE/FAA/ TM	Responsible for Data extraction from the clients' input, dissemination of data and aligning it to the EIA preparation for Infra development and allied sectors
6	Head Business Development	Leader in Business development	Business Development activities , Responding to Enquiry & offer submission , negotiation and securing Work Orders/ Contracts
7	Manager -HR	Leader in Talent search, hire and engage	Responsible for Human Resources interface

QUALITY MANAGEMENT SYSTEM PROCEDURE

1. Purpose:

To define Quality Management System

2. Scope

This procedure is the prime reference document used for preparation of Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) and Laboratory work.

3. Responsibility

Quality Manager/HOD is responsible to establish and maintain this procedure.

4. Reference

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015 and Subsequent amendments

5. Procedure:

QMS will have following system:

5.1 A quality Policy which will:

a. be appropriate to the Organization's business
b. show commitment for continual improvement
c. provide a framework for setting objectives and a review mechanism
d. be communicated and understood within the organization
e. focus on customer satisfaction

It will be reviewed and revised if required once in two years and annexed as Annexure-1 Quality objectives will be made yearly, reviewed and revised and annexed as Annexure-1b

QUALITY POLICY

PESPL is committed to delivering enhanced and up-to-date environmental consultancy services to all its customers by leveraging its expertise, organizational knowledge, and a robust process of continual improvement.

PESPL commits to maintain quality up to international standard in all documented outcomes, ensuring compliance, accuracy, and timely delivery. This is achieved through a structured internal review mechanism and SMART objectives that are carefully evaluated by management and effectively implemented by our team of experts.

PESPL ensures that quality objectives, goals, and targets are consistently formulated, reviewed, and adhered to on a recurring basis. Our management, quality cell, managers, and employees are dedicated to ensure that this policy and our objectives are well understood within the organization and effectively communicated to all stakeholders.

PESPL assures total satisfaction to all its customers through its systematic procedures and clear communications that lead to a seamless understanding of the requirements and deliverables.

1 PESPL will have following Quality Management System Procedures:

1.1. Control of documents including records:

I. Uniquely identifying documents and records
II. Approving documents prior to issue
III. Reviewing and updating of documents, as required
IV. Ensuring quick availability of relevant revision of the document
V. Storage, protection and retrieval of documents and handling of outdated/superseded documents

It is adequately defined in the QP-001.

1.2 Performance Measurement and Review:

I. Fixing Key Performance Indicators (KPI) of experts involved in EIA, which should include quality of the EIAs they are associated with an annual

appraisal of the same

II. Assessing / ensuring the quality of EIA reports prepared
III. Improving skill level of experts through training
IV. Periodic and systematic audit, both internal and external and follow up action for closure of Non conformances NCs/ observations.
V. Management review giving periodicity and issues to be taken up including feedback from project proponent/public hearing/environment appraisal committee/state
VI. environment appraisal committee on quality of EIA reports prepared and necessary follow up action.

It is adequately defined in the **QP002, QP003, QP004, QP005 & QP006.**

1.3. Actions taken to address Non-conformances:

I. Analyzing the NCs/ Obs. of internal audits as well as external audits including NABET to identify the causes and the actions (corrective and preventive) to be taken,
II. Identifying resources and other inputs required for such actions,
III. Fixing the time frame and the responsibility for the actions,
IV. Ensuring the completion of the actions to be taken,
V. Ensuring amendments in the procedure for the prevention of the recurrence of such NCs.

It is adequately defined in the **QP007.**

1.4. Identification, retention and assessment of performance of empanelled experts:

I. Specifying qualifications and experience requirements of the experts
II. Assessing the work done by the prospective experts prior to their retention
III. Framing the “terms of reference” for retention of the expert, including preparation of the report for her/his portion of the work
IV. Assessing performance of the work done by the experts for the organization,
V. Ensuring updation of the knowledge level of the expert (a suitable procedure should also be included for updating the knowledge level of in-house experts).

It is adequately defined in the **QP008.**

1.5. Collection and measurement of primary data:

I. Site visits by the EIA team to familiarize about site conditions to plan for the EIA, selecting the number and location of monitoring stations, the type of sampling and parameters to be monitored,
II. Interpretation of data including statistical analysis to arrive at meaningful information,
III. Specifying the type of biotic environment data to be collected as appropriate for the scope of EIA, methodologies to be followed and interpretation of the data.
IV. Specifying the type of socio-economic environment data to be collected as appropriate for the scope of EIA, methodologies to be followed and interpretation of the same.

It is adequately defined in the **QP009.**

1.6. Collation, synthesis and interpretation of secondary data defining:

I. When secondary data would be resorted to
II. Relevant secondary data to be collected as appropriate for EIA requirements
III. Sources of secondary data ensuring their reliability and age
IV. Validation of important secondary data by cross verification at the site or from other sources
V. Ensuring the brevity of the data (eliminating irrelevant information) It is a good practice to give reference to the source when secondary data is used.

It is adequately defined in the **QP010.**

1.7. Work Outsourced:

I. Defining the conditions when outsourcing would be resorted to
II. Assessing the capability of the agency to take up the work to be outsourced
III. Drawing up the terms of reference for the outsourced work
IV. Identifying steps to be taken to ensure the quality of the outsourced work

V. Extracting the relevant portions of the outsourced work for inclusion in the EIA report
VI. It is adequately defined in the **QP011**.

1.8. Laboratory Work for Baseline Data:

I. Assessing a laboratory for its capability to analyze the parameters required for collection of baseline physical environment data for EIA studies,
II. Identifying the scope of work to be assigned to the lab and those to be done by the EIA consultant organization,
III. Collection, preservation and transportation of samples from site to the laboratory,
IV. Quality assurance by the EIA team of the primary data collection work including supervision at site,
V. Type of records to be maintained by the laboratory and the EIA team on the baseline data collection work,

It is adequately defined in the **QP012**.

1.9. Complaints and appeals:

I. Informing the clients about the provision of complaints and appeals
II. Accepting complaints/ appeals,
III. Handling and disposal (including authority and responsibility) of the same within reasonable time,
IV. Maintaining records of complaints/ appeals,
V. Ensuring implementation of preventive/ corrective actions

It is adequately defined in the **QP013**.

1.10. Master list:

Master list of Quality Procedures (QPs), Standard Operating Procedures (SOPs) and Quality forms and formats (QF) is maintained and controlled with revision number and dates.

These lists are maintained by the Quality Manager.

1.11. Documents/Records

S.No.	Document Name	Document Number

1.	Master list of Quality Procedure (QP)	PESPL/QMS/ML-QP/01/00
2.	Master list of Standard Operating Procedure (SOP)	PESPL/QMS/ML-SOP/02/00
3.	Master list of Quality form/format/files (QF)	PESPL/QMS/ML-QF/03/00
4.	Quality Policy	Annexed as Annexure-1.-PESPL/QMS/AX/01/00
5.	Quality Objectives	Annexed as Annexure-1b.-PESPL/QMS/AX/02/00

QP001 DOCUMENT CONTROL INCLUDING RECORDS AND ELECTRONIC STORAGE OF DATA (INTERNAL AND EXTERNAL DOCUMENTS)

1. Purpose

To ensure control of documents including records with unique identifying, approving, reviewing, and updating system, issuing and revision method, proper handling, storage, and retrieval system including electronically storage and handling system and document of external origin.

2. Scope

This procedure is applicable to all relevant documents and records required for establishment and maintenance of QMS system for quality of Environmental Impact Assessment Report (EIA).

3. Responsibility

The overall responsibility of control of documents generated lies with the Quality Manager. The designated responsibilities for each step of document preparation, review, and approval are listed in Table 1.2

For the control of records: Section in-charges are responsible for the

implementation and maintenance of the procedure of the organization.

4. Reference:

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015

5. Procedure for control of documents

5.1 Preparation

The Preliminary draft of the document is created and put for 1st level review to the team head and then it's forwarded to Business Head for 2nd level review. After that the final review is being done by the Quality Control Council to ensure the quality of the document.

About Approval of Document:

Approval of the document is contingent upon review and acceptance/approved by the Quality Control Council. Only Approved Document is being submitted to Client/EAC

5.2 Final Document

1. All documents prepared by PESPL will bear a Unique Identifier of Document (UID) Number on the First Page of the File along with the Date of Preparation. 2. New Order/Project approved by Client- Business Development Head will allot Pcode as per the current procedure.

5.3 Unique Identification of Documents and Records

PESPL has established a procedure to prepare, modify and distribute the following documents in order to carry out any consultancy activity -

- **Quality Management System:**

To illustrate a systematic approach on how an organization addresses a quality management system.

- **Quality Procedures:**

These are procedures which provide step by step instructions on how specific workflows are carried.

- **Quality Formats:**

These are formats formulated to record the results of all surveys done and data generated on performing an activity.

- **Reference documents:**

These are external documents that are used as reference in carrying out any specific pre-defined activity through a set procedure.

- **Annexures:**

These are supplementary materials/documents used for procedures.

5.4. System of Document Control

Table 1.1; Document Control System 5.5 Issue and Review of documents:

S.No.	Level No.	Description	Reference Number
1	Level 1	Quality Management System Procedures: QMSP	PESPL/QMS/QP/xx/y Where, xx indicates two digits Sl. no. y: indicates revision number
2	Level 2	Standard Operating Procedures	PESPL/QMS/ML-SOP/02/ 00
3	Level 3	1) Quality Formats/Forms: QF 2) Reference Documents: RD 3) External Origin : EX 4) Annexure : AX	PESPL/QMS/QF/xx/yy PESPL/QMS/RD/xx/yy PESPL/QMS/EX/xx/yy PESPL/QMS/AX/xx/yy
4	Level 4	Project Code for EIA report	PE/xx/yy: Where, PE indicates Company name, xx indicates: Financial year. YY indicates: Index code of proposal

Table 1.2; Designated Personnel for the preparation, review, and approval of various documents and their maintenance

S.No.	Document	To be Developed & Updated by	Reviewed & approved by	Periodicity
1	Quality Policy and quality objectives	Quality Manager	CEO	Yearly
2	QMSP Quality Procedure (QP)	Quality Manager	COO	Yearly
3	Quality Formats	Quality Manager	COO	Yearly
4	Document Control Record	Quality Manager	COO	Yearly
5	EIA Team & Assignments	BD/BH	COO	1 Month
6	Internal Audit/RCA-CA/PA Record/MRM/Customer Feedback/Complaint	Quality Manager	CEO	6 Months

7	Training Plans & Records	EIA Division Incharge EIA Division Incharge	Quality Manager CEO/Director	6 Months

All the documents are issued by MR.

I. About approval: ……..
II. A stamp of "Master Copy" identifies master copy in green color and a stamp of "Controlled Copy" in blue color identifies controlled copy on cover pages of each document.
III. External documents such as product specifications, codes, standards, notification/norms are maintained at relevant departments, while a list of such documents is maintained with the Quality manager.
IV. A master distribution list indicating current revision of documents is issued and updated by the Quality manager.
V. Quality manager holds all master copies of documents and circulates documents with control copy stamps.
VI. Last version of Obsolete documents is preserved for any future reference and stamped as "Obsolete" in red color. All obsolete documents are withdrawn prior to issuing the next revision.
VII. COO/VP approves all the documents in the absence of the CEO.

5.6 Updation of Documents - Changes and/or Modifications

I. All documents and records are updated or modified for continual improvement from time to time as per inputs received during appraisal from EAC/SEAC and Public hearing, feedback from customer, external/internal audit and assessment audits or any other relevant development.
II. These requests are reviewed in regular/ MRM meetings.
III. The changes are reviewed and approved by the same person/authority approving the original Document. In the event, when the person who had originally approved is not available, background information for the changes is made available to the approving Authority. Quality manager updates the master distribution list also.
IV. Quality manager issues the controlled copies of revised documents to all concerned control copy holders.
V. Quality manager marks the old documents as obsolete by a red stamp and stores the same in a separate file for future reference if any.
VI. The issue number of the quality system procedures will be changed after six revisions or after three years excluding the revision history sheet and contents pages. The changes in contents of the quality system Procedures will be entered

in revision history and amendment details.

5.7 Quick Availability of Relevant Revisions of the document.

QMS Document:

- All the documents have a unique Document number.
- Quality manager issues the controlled copies of documents to all concerned referring to the master distribution list and keeps a record.
- (A stamp of "Master Copy" in green color identifies master copy and a stamp of "Controlled Copy" in blue color identifies controlled copy on cover pages of each document.
- All other approved documents related to QMS which are controlled copies are maintained and issued by Quality manager
- Documents of external origin will be maintained, at concerned sections, in concerned files.

EIA Reports & related documents: The Master copy (Original Signed copy) of the EIA reports and related documents shall be maintained by the respective EIA Coordinator (EC) for EIA. EIA coordinators will ensure that all relevant documents for EIA are available. Every EIA report is given a Document Number.

Example of a correct UID is PE252745-C-03
where PE indicates-Company Name, 25-Indicates financial Year, and 1234 indicates index code of Proposal followed by hyphen and then Document name and it is completed by version no's

Documents are named as below:
A- FORMS, B- PFR for Feasibility Reports, C- Application for Application Form (single file), D- TOR/ TOR compliance for TOR Letter and its compliance , E- EIA for EIA Report, F- Encl for any other annexures,G- Single file of EIA Document.H- Presentation Document, J- Any FAE Report, K- Other for any document type not covered

Version no are named as below:
Initial draft suffix is 00; PP reviewed and QA reviewed are 01 and 02 respectively; Uploaded copy suffix is 03; Submitted copy suffix is 04, the Circulated copy will be 05; any changes subsequent to the Presentation or suggested by EAC is 06 and

if needed 07 too.

Initial draft suffix is 00; PP reviewed and QA reviewed are 01 and 02 respectively; Uploaded copy suffix is 03; Submitted copy suffix is 04*; *04 version is the same at PH and Online stage for EIA and the Circulated copy will be 05; any changes subsequent to the Presentation or suggested by EAC is 06 and if needed 07 too.

This UID will on the cover page of the document only

5.8 Storage, Protection and Retrieval and Handling of outdated/superseded documents

I. After completion of a project, documents are stored by the concerned person in files to provide easy access and traceability.
II. The documents and Records are retained in the suitable environment to ensure no damage or deterioration takes place during the retention period. Proper pest control is done at the physical location from time to time.
III. Documents are retrieved by authorized personnel from the storage location specified along with the document number.
IV. There is also a recurring backup that is taken of all documents stored in soft copy on the server.
V. All old versions of amended documents are stamped as “Obsolete” in Red color and are promptly removed from all locations and communicated to all the holders.
VI. All documents and records are preserved for a specified period as they can be required by any authority or any litigation use.
VII. Retention periods for all documents are specified below –

Table 1.3:

S.No.	Document Name	Retention Period
1	Master list of Records	Till next revision
2	PESPL legal records/EIA reports	Life time
3	Archived documents (EIA, EC and Reference documents, etc.)	Hard copies - 2 years Soft copies – Life time
4	Employee HR	5 years
5	Document Change Requests	2 years

6	Obsolete copy of QMS & other documents	2 years

All documents and records will be destroyed in a controlled manner by shredding hard copies and deleted soft copies permanently from the system.

6 CONTROL OF RECORDS AND ELECTRONIC STORAGE OF DATA

6.1 Control of Records

Electronic Records are controlled by the procedure same as that of control of documents as per QP001. Records of the organization which are kept in hard copy are controlled by the stamping of records with red color ink on each page of quality records and the cover page of technical and other records.

Records kept in hard format will be stamped with a controlled copy/ timestamp mark [if required, circulation or submission] on the cover page.

6.2. Issuance, Disposal, and Retention of Records

Issuance, disposal and retention of records is maintained by the filing section.

6.3. Electronic Storage of Documents and Records

I. The server allows all users as per their designation, section, and other details to store, access, and retrieve data from the server. This means that users may read, write and own folders and files.

II. Storage is done in the designated folder in Google Drive. Access is granted based on username and password and record of the same is stored in archive drives.

III. Storage shall be done as per the name of the project in the root folder of the designated section. Example: - <Shared Drive><EIA-GDrive><Project Folder><Sub-Folder e.g. 6. EIA Stage> Folders by any other name other than that of the project shall not be allowed other than manuals, references, books, or other data.

IV. Files shall not be repeated and subfolders may contain information such as Submission, circulation, or Presentation documents. The folder shall be indicative of the type of document i.e. level and process at which the report/ document was made. All documents from the client are also saved in the same.

V. Users are not normally allowed to change or overwrite data. This shall only be done by the section in charge or on the consent of the Manager.

VI. Users are allowed to save their personal, inter-department, and backup data for temporary storage on W: by the name of public sharing in the mapped drive over the Network.

VII. All files on the server to be stored in the format of "Company Group Name_Company Name_Location(District Sector)_Category".

VIII. Example:Godrej_Oasis_Gurgaon_Sec.88-89_Cat.-8(b)-B.

IX. All work done by all sections in the day is ultimately put to designated folders in the server where the data of the organization is secure. This is mandatory and failure by users to do so results in warnings by the senior manager and ultimately official warning by the management.

6.4. Access of files to users

Google Drive is linked to Local Network-attached storage (NAS) at 49.205.179.130 in a different geographical location. This NAS is only used for emergency purposes and to close Google Drive. Another NAS hosts an internal LAN 10.0.0.110 sharing drive for only internal file transfer and printing purposes and thus not an official storage drive.

Access to the Google drive is based on the group policy of Lab, EIA, NOC, admin, and management; wherein they are allowed to read and write their folders and are restricted access to another. (to be put in tabular form)

All users are normally mapped on this basis and if thereafter illegal mappings are made, the username shall not be authenticated by the server.

Quality documents are protected from tampering by any user other than designated Personnel i.e. Quality Manager under the supervision of the Top Management by a temporary password for the folder. Other users have read-only access to the folder and files.

6.5. Backup of Documents and Records on Server

I. Internal sharing drive on LAN 10.0.0.110 is hosted through NAS (Network-attached storage) alongside google drive close at 49.205.179.130.-(GSP to be referred)

II. The above-said servers are maintained in RAID 5 configuration and the backup

of the server is made selectively for folders. The folders backed up hourly on a time capsule via time machine are EIA, Lab, NOC, Accounts, Admin, R&D, and Quality Documents. That is all folders except Public Sharing are covered in the backup.

III. Cloud backup is taken on the server at 11 pm every night by cloning and thereafter uploaded on dropbox securely remotely. This does not include any data of Public Sharing.

6.7. Maintenance of Server, other electronic resources

I. The main folder is on google drive and thus on the cloud, it is entrusted to Google Workspace services to maintain the main server. The On-premises server which is a clone of the cloud server is maintained in-house.

II. Level 1 routine server is maintained by Automator or server which is done weekly.

III. The server is maintained by proper standby shut down on holidays which is controlled by the admin.

IV. Other emergency issues are handled by the IT Head and unsolvable issues lead to the stoppage of the server and sending hardware to the service desk.

V. For the temporary data access, the backup is made on a secure hard disk and is circulated to section incharges.

7. Document/Record:

S.No	Document Name	Document Number
1	Document Control	PESPL/QMS/QP/01/00
2	Master List of Documents and Control Records	PESPL/QMS/ML-DC/04/00

QP002 PERFORMANCE EVALUATION OF EXPERTS

1. Purpose

To lay down a procedure for performance evaluation of all persons involved in EIA work.

2. Scope

This procedure is applicable to the EIA Coordinators, Functional area experts, Functional area associate, Team members, Mentors including empanelled experts.

3. Responsibility

The Human Resources (HR) Manager, CEO/COO is responsible for the implementation and

approval of the procedure.

4. Reference: QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015

5. Procedure

5.1 Roles and Responsibility of Experts

I. Experts are given Key Responsibility Areas (KRAs) by the Management. This is majorly based on the current job description and as per the requirement of the management for the expert.

II. KRA(s) are reviewed/revised by the management annually or whenever there are changes in the office management system, management, or major shuffle in the organization or any relevant changes in the EIA notification.

5.2 Performance Indicators of the Experts

Fixing Key Performance Indicators (KPI) of experts involved in EIA, which should include quality of the EIAs they are associated with and, annual appraisal of the same

I. Management formulates indicators for the performance of experts as per the requirement of management and as per the depth of the review/ assessment requirement.
II. The performance indicators are based on the following but are not limited to the quality of work, the quantity of work, timeliness of delivery, extra efforts

undertaken, skill added, and improvement in work from the last review.

III. Technical Review of experts is done annually and is linked to the monthly payment of the individual.
IV. Appraisal may be impacted if evaluation of experts is negative.

6. Record

Records for all reviews, evaluations are maintained by the management, and the same along with the non-technical review/ evaluation of experts is used for annual appraisal of all experts/ employees.

Records are maintained whenever is done, normally annually but may be done as required by the top management. It is authorized by the management directly.

7. Document/Record:

S.No.	Document Name	Document Number
1.	KPI	PESPL/QMS/QF/021/00
2.	KRA	PESPL/QMS/QF/022/00
3.	Appraisal form	PESPL/QMS/QF/023/00

QP003 QUALITY ASSURANCE OF EIA REPORT

1. Purpose

To establish a systematic approach for evaluating and ensuring the quality of EIA reports, guaranteeing that they meet the required standards and provide accurate information for informed decision-making.

2. Scope

The procedure applies to the procedures related to the preparation of EIA reports and therefore ensuring continual improvement.

3. Responsibility

EIA Coordinator (EC)/FAE/Mentor/Business head.

4. Reference:

EIA Notification 2006 and amendments till date, QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015, MoEF……,

5. Procedure:

S. No	Schedule of Meeting	MOM Formats	Format Number
1	Kick off Meeting to be conducted immediately when Project is handed over to team	**Tier 1 - Level 0 - INTERNAL KICK OFF MEETING MINUTES**	PESPL/QMS/QF/33/00
2	To be conducted after Project sheet preparation	**Tier 1 - Level 1** - PRE-APPLICATION MEETING MINUTES	PESPL/QMS/QF/33/00
3	To be conducted during sampling plan preparation	**Tier 1 - Level 2** - SAMPLING PLANMEETING MINUTES	PESPL/QMS/QF/33/00
4	To be conducted before submission of TOR Application	**Tier 2 - Level A**- TOR APPLICATION MEETING MINUTES	PESPL/QMS/QF/33/00

5	To be conducted before conducting monitoring	**Tier 2 - Level B** - BASELINE DATA COLLECTION MEETING MINUTES	PESPL/QMS/QF/33/00
6	To be conducted after TOR is issued/recommended & before initiating EIA	**Tier 1 - Level 3** - PRE-EIA MEETING MINUTES	PESPL/QMS/QF/33/00
7	To be conducted after Draft EIA is prepared	**Tier 1 - Level 4** - DRAFT EIA MEETING MINUTES	PESPL/QMS/QF/33/00
8	To be conducted before EIA submission - Public Hearing / Final	**Tier 2 - Level C** - FINAL EIA MEETING MINUTES	PESPL/QMS/QF/33/00
9	Submission of EIA report & PPT to EAC for EC Presentation, along with Agenda		TFO1 - FOR REQUISITION SLIP FOR PRINTING , TF06- TECHNICAL FORMAT FOR HANDOVER UPLOADING DOCUMENTS, TF05- TECHNICAL FORMAT FOR HANDOVER PPT EAC MEETING, UPDATION OF PROJECT SPACE
	EC Presentation at EAC, NOTE- IF ADS or any query arises, reply has to be submitted for the same within the stipulated time.		TFO2- FOR EAC MOM TO TEAM EIA
	AFTER RECEIVING EC		TF08- TECHNICAL FORMAT FOR CLOSING OF PROJECT

6. Quality Checks:

- Site and project description with photographs, layout maps, process flow diagrams of the manufacturing processes, material balance, environmentally

sensitive receptors like water bodies; wetlands and estuaries, forests, wildlife sanctuaries, national parks, biosphere reserves; human habitations, schools, and hospitals; archaeological and historic monuments; croplands industries, and the like.

- Consideration of alternative sites, technology, and processes
- Primary baseline data Collection, Secondary data and it's validation
- Interpretation of data for ecological and social baseline conditions and assessment for identification of environmental impacts and quantification, where applicable
- Risks assessment and consequence analysis including an emergency plan.
- Environmental management plan and its monitoring
- Duly signed declaration of experts' involvement in EIA preparation
- Compliance to TOR and public hearing
- Quality check weightage format number will be filled for the Quality assurance of the EIA report.

6.1 Review of EIA at first level

I. The Business Head/ EIA coordinator (Sector specific) of the respective team (Estuary, Pond, Pool, Tributary, Ocean) is responsible for review and evaluation of the EIA report as per the data from the client, TOR issued by EAC/ SEAC, Comments from FAE/ EC/ TM, and other experts. This evaluation of the first level is recorded and saved in the file.

II. The reviewed/ checked document undergoes a correction process for the points raised in the first review and the corrected file is again reviewed by the first reviewer.

III. The first level reviewer, therefore, plays an important role in the functioning of the QA section and also plays an important role in the appraisal of the team whose report was reviewed.

6.2 Second Level Review

I. The second level reviewer examines the report before sending the report to the client/ submission to SEIAA/ MoEF&CC. This review is done at the level of an experienced person who has been selected as a part of the Quality Control Council for that particular project.

II. The second-level review is also responsible for evaluation as per the criteria in the prescribed format and is essential in the appraisal of the EIA Report and the

preparation team. The second-level review also reviews the detailed chapters of FAA/FAEs/ TM involved in the EIA.

III. The document is shared to the QCC for review via Technical Format for Quality Control Records. The review/ comments will be shared with the BH/ EIA Coordinator via technical format for QCC response and are kept in QA comments in the performa of technical Project Sheet.

IV. Based on the recommendations of the second reviewer, the document is finalized and sent for submission to Client/ EAC/ SEAC.

6.3 Additional Review(s)

I. Additional reviews might be done as per the recommendations of the secondary reviewer for cases where a specialized process/ industry has been undertaken.

II. The additional review shall be carried out at the level of Mentor or any external person (as Team Member in the EIA); this is optional and is done rarely for cases. This is majorly applicable for non-routine cases which require special attention especially concerning the process of the industry and its environmental aspects.

III. Additional reviews might be done for random projects by senior mentors/ ECs in the organization for random checking

IV. Random additional review of EIA might be done during an internal audit if required, this depends on the audit plan prepared and the availability of auditee and auditor during an internal audit.

V. Additional review will be done to address complaints/ requests from client/ EAC/ Project Proponents, if required in any case

TABLE 6.1; Criteria For Evaluation And Review Of Eia Reports Along With The Weightage Scheme. Other Criteria Apart From The Above Given May Be Included As Per The Reviewer And Case To Case Basis.

S.no	Parameter of EIA Weightage	Weightage
1	Site and project description with photographs, layout maps, process flow diagrams of the manufacturing processes, material balance, environmentally sensitive receptors like water bodies; wetlands and estuaries, forests, wildlife sanctuaries, national parks, biosphere reserves; human habitations, schools, and hospitals; archaeological and historic monuments; croplands industries, and the like.	10%
2.	Consideration of alternative sites, technology, and processes.	5%
3.	Methodology for collection of - • Primary baseline data for the physical environment (sampling location, preservation, analysis) • Secondary data (reference, relevance, authenticity, period, ground validation).	15%
4.	Interpretation of data for identification of environmental impacts and quantification, where applicable	15%
5.	Interpretation of ecological and social baseline conditions and assessment of potential impact and mitigation measures.	10%
6.	Risks assessment and consequence analysis including an emergency plan	10%
7.	Environmental management plan and its monitoring	15%
8.	Duly signed declaration of experts' involvement in EIA preparation.	10%
9.	Compliance to TOR and public hearing	10%
TOTAL SCORE 100%		

7. Records:

S.No.	Document Name	Document Number
1.	Minutes of Meeting	PESPL/QMS/QF/024/00
2.	QA comments/checking sheet	PESPL/QMS/QF/012/00
3.	EIA report	PE/xx/yy: Where, PE indicates Company name xx indicates: Financial year. YY indicates: Index code of proposal

QP004 TRAINING OF EXPERTS

1. Purpose

To lay down a procedure for Improving skill level of experts through training.

2. Scope

This procedure is applicable for the identification of training needs and execution of the training program of the experts along with evaluation.

3. Reference

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015

4. Responsibility

HOD/Quality Manager/COO

5. Procedure

5.1. Identification of training needs

HOD identifies the training needs:

- Induction training as per the skills
- Job specific training
- As per the feedback of the work quality of output, timeliness, and accuracy
- Training identification if a new type of work is assigned or new equipment or software is installed.
- based on an annual performance review

5.2. Development of the training program

5.2.1. Preparation of Annual Training:

I. Based on the cumulative recommendations of the HOD/appraisers/reviewers annual training program is prepared as per training format number: PESPL/TRAINING_PLAN/002

II. An internal training program is also conducted from time to time based on the specific requirements.

III. The training coordinator gives a training schedule for the training including timings, syllabus, and faculty to all concerned before the scheduled training date.

5.2.2. Evaluation of Training

A detailed feedback/ evaluation of training is taken by the faculty for all the attendees and a pass mark of more than 60% is set. If performance below 60% is found for any of the attendees then Re-training is arranged. In case of the second failure, the trainee is put to other roles/jobs within the organization. Failure to show performance & improvement even in the new role/job, the person may be issued a warning letter based on non-performance.

6. Records

S.No.	Document Name	Document Number
1.	Training Plan	PESPL/QMS/QF/013/00
2.	Training Schedule	PESPL/QMS/QF/014/00
3.	Training attendance	PESPL/QMS/QF/015/00
4.	Training Feedback	PESPL/QMS/QF/016/00
5.	Training Evaluation Form	PESPL/QMS/QF/017/00

QP005 INTERNAL AND EXTERNAL AUDIT

1. Purpose:

To lay down a procedure for Periodic and systematic audit, both internal and external and follow up action for closure of Non conformances NCs/ observations.

2. Scope

This procedure applies to all activities of the QMS

3. Responsibility

The Quality Manager/Deputy Quality Manager

4. Reference:

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015.

5. Procedure

5.1. Audits are designed for one or more of the following purposes

I. To determine conformity or nonconformity of the activities to the specified requirement and elements of the quality system.

II. To determine the effectiveness of the implemented QMS in achieving the quality objectives.

III. To verify compliance of quality activities and related results with the planned arrangements, documented QMS.

IV. Internal Quality Audits are conducted once in 6 months & the audit is conducted by a person with no conflict of interest, maybe external but must be competent to carry out the internal audit.

5.2. Audit planning and schedule

I. Quality Manager / Deputy Quality Manager makes an annual plan for internal and external audits at the beginning of the year. External audits are conducted by Certification/accreditation bodies for the continuation/renewal of the certificate.

II. Based on the annual plan, the Quality Manager / Deputy Quality Manager

prepares the internal audit schedule depending on the status and importance of the activity. The Quality Manager appoints the internal auditors. Auditor is required to audit all applicable elements of the quality Management system.

III. Quality Manager / Deputy Quality Manager informs the audit schedule to all auditors and the auditees.

5.3. Execution of the audit:

I. During the audit, the auditor covers the entire scope of the audit as per the annual audit plan.

II. Before starting the audit the auditor properly prepares a checklist for convenience in audit, to save wastage of time during the audit, and to follow a professional approach.

III. Quality Manager/Deputy Quality Manager conducts an opening meeting for the auditors and the auditee's heads to ensure availability of the resources and facilities required to conduct the audit.

IV. Evidence is collected through interaction, the examination of documents, and observations of activities & conditions in the concerned area/function.

V. Evidence indicating nonconformity are noted, and investigated.

VI. Audit findings are documented on the non-conforming report.

5.4. Audit Report

The audit team shall submit their findings and observations of the audit conducted in their respective areas including the Major & Minor NCs to the Quality Manager/Deputy Quality Manager after the completion of the Audit and timeline is fixed. A copy of this report is available to all Auditee(s) through the HOD.

5.5. Corrective action and follow-up

I. The Auditees department is responsible to determine and initiate corrective action required to correct the nonconformity and do the root cause analysis for the closure of the raised non-conformity report.

II. Corrective action and its follow-up are completed within a period, agreed by the auditor and auditees dept.

III. On the agreed completion date or earliest possible, the auditor verifies the closure up to satisfaction & effective implementation of the corrective action taken.

IV. The auditor records his comments regarding verification of the corrective action taken. On satisfaction, he signs and closes the nonconformity.
V. Quality Manager includes the audit report with details of the corrective actions taken in the agenda for the next Management Review Meeting.

5.6. AUDIT CRITERIA

The findings of the audit are categorized under three categories:

a) Major-when more than 50% of samples are non-conforming or the implementation is inadequate as per or NABET Scheme Version 3;

b) Minor- when less than 50% samples are non-conforming;

c) Observation/OFI (Opportunity for Improvement) – which may result in non-conformity at the later stage if not addressed immediately

6. Records:

S.No.	Document Name	Document Number
1.	Internal Audit	PESPL/QMS/QF/018/00

QP006 MANAGEMENT REVIEW MEETING

1. Purpose

To lay down a procedure for Management review giving periodicity and issues to be taken up including feedback from project proponent/public hearing/environment appraisal committee/state environment appraisal committee on quality of EIA reports prepared and necessary follow up action.

2. Scope

Internal Audit, Public hearings, and appraisal of EIAs.

3. Responsibility

The Quality Manager/CEO/COO

4. Reference:

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015.

5. Procedure

5.1. Planning

I. The frequency of the Management Review Meeting is after every Internal Audit. Although extra MRM may be planned for the requirement of specialized EIA, discussion on external assessment

II. Before the date of the meeting, the Quality Manager Circulates the agenda to all concerned including the CEO, Director, and other key personnel.

III. The Quality Manager collects the information and summarizes it for input to Management Review. However, other points besides the points given below are also included in the Agenda prepared by the quality manager;

Agenda Points of MRM:

A. Review of follow-up actions on the decisions taken in the previous management review meeting.

B. Review of results of internal/external audits

C. Review of Customer feedbacks including complaints

D. Review of process performance and service conformity.

E. Review of corrective and preventive actions taken.

F. Review of changes made in the organization's functions that affect the Quality Management System including continuing suitability of the Quality Policy.

G. Recommendations for improvement.

H. Review of all technical & Quality Management System issues.

I. Review of Requirement of EIA ongoing

J. Review on Process of EIA projects including other requirements of the section concerning completion.

K. Review on the status of EIA projects and the respective reasons for being held up in various stages of the process

L. Review on the feedback from SEAC/SEIAA/ MOEF on EIA reports

M. Discussion on Feedback of employees and other experts

N. Discussion on Quality Assurance of EIA reports and detailed analysis of the review done at the first and second level

O. Discussion over the performance evaluation of Empanelled experts, in-house experts, upcoming FAA/FAE(s)

P. Discussion over requirements of infrastructure, manpower other resource requirements which can be dealt with by the management

Q. Any other points in agenda by the Key persons, directors or Quality Manager

5.2. Meeting

I. The CEO / COO chairs the meeting. All the personnel are requested to bring the relevant information and evidence of the agenda points.

II. After discussions in the meeting, actions, as proposed, are planned and responsibilities with deadlines are assigned to Auditees.

III. Minutes of the meeting are prepared by the Quality Manager and are approved by the CEO / COO.

IV. The minutes of the meeting are circulated to all the members post-approval

5.3. Follow Up

After the Completion of deadlines, a report on the actions taken on the points (as decided in the meeting) is prepared by the Quality Manager and submitted to the CEO / Director.

6. Record

S. No.	Document Name	Document Number
1.	MRM Notice	PESPL/QMS/QF/019/00
2.	MRM minutes	PESPL/QMS/QF/020/00

QP007 CONTROL OF NON-CONFORMING WORK

1. Purpose

To lay down a procedure for Analyzing the NCs/ Obs. of internal audits as well as external audits including NABET to identify the causes and the actions (corrective and preventive) to be taken

2. Scope

This procedure applies to Internal Audit and External Audit for QMS

3. Responsibility

The Quality Manager/Auditee

4. Reference:

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015 and ISO 9001:2015.

5. Procedure

5.1. Analyzing the NCs/Observations of Internal/External Audits including NABET to identify the causes & action to be taken

The organization has procedures to take corrective actions and preventive actions when NCs are found. During IA all NCs that are identified and their resolutions and decisions are taken by management in the management review.

Non-Conformities and/or Observations if received from NABET; the Quality Manager/HOD shall assess the root Cause, Severity of the same to QMS performance, whether any of them can be a risk to our processes, the corrective and preventive actions required to close the NCs and to ensure that such NCs do not re-occur. According to, Quality Manager/HOD will ensure the Compliance of action to be taken in this matter.

5.2. Resource Identification

Quality Manager/HOD will identify the resources and approval from the Management required to close and prevent the NCs/Observations.

5.3. Fixing the Time Frame and Responsibility

The time frame for all actions is in the NC report. It is the responsibility of the

Quality Manager/HOD to ensure completion within the stipulated period.

The responsibility and time frame to close the NCs/Observations along with root cause analysis shall be identified by the HOD and the details will be recorded in the NC report.

5.4. Ensuring the Completion of the actions to be taken

If there is a need to amend the procedure to prevent the recurrence of such NCs, they must be discussed in the management review meeting.

I. Persons responsible for the closure of NCs/Observations are required to complete the task in time, as mentioned in the NC report. Quality Manager/HOD shall monitor the progress of work by obtaining the interim status of the work execution. Summary of the NC report will be discussed in the MRM. The decisions on such actions are to be identified, arranged, and executed by the decision of MRM.

5.5. Amendment in the Procedure

Systemic root Cause analysis will be carried out and if required the concerned procedure will be revised. The change request shall be processed as per **Procedure QP001 DOCUMENT CONTROL.**

6. Records:

S.No.	Document Name	Document Number
1.	CAPA (NABET/EAC/Customer feedback)	PESPL/QMS/QF/25/00

QP008-IDENTIFICATION, RETENTION AND ASSESSMENT OF PERFORMANCE OF EMPANELLED EXPERTS

1. Purpose:

To lay down a procedure for appointing empanelled EIA Coordinators (ECs) and Functional Area Experts (FAEs) and review their Performance and obtaining management approval for their retention.

2. Scope: Applicable to all NABET approved Sectors available with Perfact Enviro

- Identification of Specialization/expertise services to be procured.
- Evaluation and empanelment of experts based on the project experience.
- Preparation of Terms of Reference or Professional Service Agreement (PSA) for retention of the Experts.
- Review and approval of Terms of Reference or PSA
- Verification of Services, reports or data delivered by the experts professionals
- Assessing through performance evaluation of the experts or professionals based on the quality and number of projects carried out for the organization.

3. Responsibility

The Human Resources (HR) Manager, and CEO/COO is responsible for the implementation and approval of the procedure.

4. Reference:

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015 and ISO 9001:2015.

5. Procedure:

5.1. Identification of Experts:

- Qualification and experience requirement for empanelled ECs and FAEs shall be based on the guidelines provided under “Scheme for the accreditation of EIA Consultant Organizations” by National Accreditation Board for Education and

Training (NABET), a

5.2.Terms of Reference of the Empanelled Experts:

The empaneled expert will collect the required data, collate and analyze it for preparation of environmental report or part thereof.

The expert will make site visits and supervise field execution of studies, as & when required.

Prior intimation and approval of management will be required for such site visits.

The expert will retain Site visit documents and submit the same to the organization as per NABET requirement.

The expert will prepare sectoral reports as specified to him in the contract document and submit the same to the organization for compilation and incorporation into the EIA report.

The expert will address the comments/observations on the report by client or EAC of MoEF&cc/SEAC, if any.

The expert will hand over the collected Secondary documents, raw data sheets, calculations sheets, photographs and other documents related to the project to the organization upon completion of his task or before expiry of his empanelment with the organization.

The experts will represent the organization before the EAC and Client, as when required. The expert will appear for an interview with the surveillance committee of QCI-NABET for his empanelment as per the Accreditation Scheme of EIA Consultants.

The expert will not disclose or divulge any project related information to anyone without prior approval of the management.

5.3. Assessment of Performance:

Assessment of Performance of the empanelled experts will be conducted annually or upon completion of assigned work or expiry of PSA, whichever is earlier as per “Performance Appraisal of Empanelled Experts” .

Further, the empanelled expert will be requested to fill Feedback Form annually or upon expiry of engagement contract with the Organization, whichever is

earlier as per "Feedback Form by Expanelled expert.

5.4. Updation of Knowledge of Empanelled Expert:

Empanelled experts will be nominated for training programs/workshops/seminars as per their availability for upgradation of their knowledge.

5.5. Retention Policy:

The empanelled expert, who has already worked with the Organization in other projects, shall be retained subject to project requirement and management approval.

6. Records:

S.No.	Document Name	Document Number
1	Training Plan	PESPL/QMS/QF/013/00
2	Training Schedule	PESPL/QMS/QF/014/00
3	Training attendance	PESPL/QMS/QF/015/00
4	Training Feedback	PESPL/QMS/QF/016/00
5	Training Evaluation Form	PESPL/QMS/QF/017/00
6	KPI	PESPL/QMS/QF/21/00
7	KRA	PESPL/QMS/QF/22/00
8	Appraisal form	PESPL/QMS/QF/23/00

QP009 COLLECTION OF PRIMARY DATA

1. Purpose

To lay down a procedure for Collection and measurement of primary data through the field work, for assessing the impacts on physical, biotic and the socio-economic

2. Scope

This procedure is applicable for the collection of Primary data for the preparation of the EIA report.

3. Responsibility

FAE/FAA/Team Member and Laboratory

4. Reference:

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015 and ISO 9001:2015.

(Refer: "QP012 for laboratory baseline collection procedures")

5. Procedure

5.1 Site visit by the EIA team:

A. Site Visit by the FAEs, FAAs and team members associated with the particular EIA shall be conducted to understand project-specific ground realities; generation of primary data (such as identification of critical environmental and social issues at the Project area, finalization of sampling/monitoring locations, public consultation,, etc.) and collection of secondary data.

B. Location of sampling/monitoring stations, frequency, and type of parameters shall be decided by the Experts during the site visit as per the study requirement considering the topographical, environmentally sensitive areas, etc. and following the guidelines issued by the Central Pollution Control Board/State Pollution control boards, Ministry guidelines and as per the TOR issued by statutory authorities.

C. As per the discussion of the above experts; the project in-charge formulates the test request for the lab and sends along with targets for the lab and other data concerning billing etc.

5.2 Collection and analysis of Data by Lab

Collection, Preservation and transportation of Samples by Lab will be done as per the

5.3. Verification/ Quality Assurance of Primary Data Collection

I. Primary data collected by the laboratory shall be done by site visits of EC/ FAE during data collection

II. Analysis of Data received from the Laboratory is reviewed by FAE for each of the FA.

5.4. Interpretation of data

● Interpretation of data is done by average, range analysis and It is also represented through Pie charts, Graphical representation and any other applicable statistical tools and Summary of data is discussed.

5.5. Collection of biotic environment data

I. FAE in consultation with EC, Mentor, and TM formulates a plan for site visit and data collection.

II. EB data collection, analysis and interpretation is adequately described in the SOP-Doc No: PESPL/FAE/SOP/10

5.6. Collection of socio-economic environment data

I. FAE in consultation with EC, Mentor, and TM formulates a plan for site visit and data collection.

II. Focus Group discussion (FGD) is also done with a Group of local people, Sarpanch, teachers, and Self help groups (SHG).

SE data collection, analysis and interpretation is adequately described in the **SOP-Doc No: PESPL/FAE/SOP/09**

6. Records:

S.No.	Document Name	Document Number
1.	Field Information Sheet- AQ	PESPL/QMS /QF/01/00
2.	Field Information Sheet-SC	PESPL/QMS /QF/02/00
3.	Field Information Sheet-NV	PESPL/QMS /QF/03/00
4.	Field Information Sheet- AP	PESPL/QMS /QF/04/00
5.	Field Information Sheet-HG&GEO	PESPL/QMS /QF/05/00
6.	FAE- Field Information Sheet- LU	PESPL/QMS /QF/06/00
7.	FAE- Field Information Sheet- SHW	PESPL/QMS/QF/07/00
8.	FAE- Field Information Sheet- WP	PESPL/QMS/QF/08/00
9.	Field Information Sheet SE (Focus Group Discussion-FGD)	PESPL/QMS/QF/09/00
10.	Field Information Sheet- SE	PESPL/QMS/QF/10/00
11.	Field Information Sheet- EB	PESPL/QMS/QF/11/00
12.	Field Information Sheet- RH	PESPL/QMS/QF/12/00

QP010 COLLATION, SYNTHESIS, AND INTERPRETATION OF SECONDARY DATA

1. Purpose

To lay down a procedure for Collation, synthesis and interpretation of secondary data for the EIA report.

2. Scope

It is applicable to all functional areas as required for the EIA report.

3. Responsibility

FAE/FAA/Team Member and Laboratory

4. Reference:

- QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015.
- Sources of information/data as described in respective QPs.

5. Procedure

Restoration of Secondary data:

5.1. Procurement of Data

I. As per the requirement raised from the FAE/ FAA/ TM the project, in charge, is intimated for the request of data along with the estimated amount of purchase as per the requirement of EIA.

II. The project in charge initiates the Purchase of data from applicable agencies as per GSP013 (PURCHASE).

III. Secondary data would be restored to environmental parameters like physiography/terrain and Geomorphology, Geology & Soil, Flora, Fauna, Drainage Pattern, Water Use (Surface & Ground), meteorology, Socio-economic, etc.

5.2. Identification of relevance and volume of Secondary data

- By the potential environmental impacts on various components of the environment, the need for relevant secondary data for EIA study shall be identified and listed with details like relevance, the volume of data required, vintage of the data (age), and the sources from where the data to be collected. Respective functional area experts shall

be responsible for the same.

● Team members, under the guidance of EC/FAEs, shall collect the secondary data from authentic sources like Government Organizations/Departments such as Survey of India, Concerned IMDs,

● National information Center database, published census documents, CPCB, etc.

Efforts will be made to collect updated and relevant data.

5.3. Verification of Data

I. The purchase is verified for the fit of the purpose of use, adequacy of the purchase, and the review and evaluation of purchase/ service concerning the item/data.

II. It may also be verified whether the vendor/supplier agency is fit for use or the item shall suffice the need or there may be more purchases.

III. Respective functional area experts shall be responsible for the evaluation of the completeness, correctness, and conformance of secondary data against the method, procedural, or contractual requirement and synthesis of relevant information for the EIA report.

5.4. Use of Data

I. Data from the external agency is used in EIA as per the directions and requirements of EC/ TM/FAE and as per the scope of EIA (TOR).

II. Data is incorporated in the EIA after the FAE report given by the respective FAE and Team Member (TM)

III. Some data might be incorporated directly in EIA but shall be done in consultation and guidance of EC.

IV. As much as possible the EIA shall be able to demonstrate the source of secondary data and shall be annexed as much as possible.

5.5. Interpretation of Data

5.5.1. Secondary data collection and data validation

The secondary data will be included in the EIA report to support the data interpretation of the primary data collected for baseline environmental conditions. The following points will be followed to include, verify and validate the authenticity of secondary data in EIA reports

I. The chief source of secondary data will be the government published reports.

II. The secondary information can also be obtained as the reports prepared by government officials duly verified by the head of the concerned department

III. In the case of the Forest department engaged in managing designated forests and wildlife, it will not be used as a secondary source for ecological data collection for those regions which does not include any forest

IV. The social and ecological data should be representative of the area being studied and not for the larger region as a district or state as the whole

V. Validation of Secondary data is done by the cross verification of collected data to ensure its reliability is done during the Site visit or from other authenticated sources.

VI. The source of secondary data will be duly mentioned below the data being represented as tabulated or graphical form

VII. The data obtained should be related to the latest reports or as applicable concerning the baseline monitoring season.

VIII. The data being used should be relevant and aptly supporting the specific interpretation being discussed

IX. The secondary data will be used in its completely original format

5.6. Brevity of the data

Secondary data collected from various sources usually contain detailed and voluminous information and only a portion (s) of the available information is useful for inclusion in the EIA reports. Therefore, it is the responsibility of the FAEs to do scrutiny of the information and only relevant portions shall be extracted to ensure brevity of data and pictorial representation; these data shall be encouraged in the form of graphs, pie charts, line diagrams, etc. wherever feasible. In the EIA report, the source and period of data are to be mentioned to enable the reader to cross verify and have belief in the accuracy of the information furnished.

6. Records: NA

QP011 WORK OUTSOURCED

1. Purpose

To lay down a Procedure for assigning outsourcing of work for some specific studies for an EIA.

2. Scope

This procedure applies to Lab baseline analysis work, biodiversity study or socio-economic study or R&R study, Geological study or any other study required for EIA Purpose.

3. Responsibility

The Quality Manager is responsible for the implementation of this procedure.

4. Reference

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015.

5. Procedure

5.1. Requirement of Outsourcing work

I. Sub-contracting shall be done for tasks that cannot be undertaken by the organization at its capacity for tasks for which experts, infrastructure, or manpower is not available. Some of the studies which form part of EIA may require to be outsourced to specialized agencies/institutes or as recommended in the TOR. Such studies may be:

- Lab baseline data analysis work
- CRZ Mapping
- Detailed Bio-diversity Study
- Marine Ecology/Aquatic Ecology
- Wildlife Conservation Study
- Detailed Hydrological Study
- Socio-Economic Study
- R & R

Any Other Specific Study suggested by EAC/SEAC

5.2. Selection of Outsourcing agency

Assessing and evaluating the Capability of the Vendors/agencies involve the following:

I. Outsourcing agencies are evaluated for competency; certifications and other experience of the outsourcing work in the past with other organizations for similar jobs or with PESPL.

II. It is decided as per the requirement of TOR and decisions made by the EC, customer, and other requirements of competent authority and relevant agencies and or other expert guidance of mentors. This shall be strictly to prepare and maintain the highest quality of EIA.

5.3. Review of Work done by the outsource

Review of work carried out by the outsource is done by the FAE and EC for its relevance in the EIA and summary of the report is provided in the EIA report.

5.4. Terms of reference for the outsourced work

I. Preparation of Terms of Reference for engagement fo agency/Vendor and then TOR shall be drawn defining the scope of work, responsibilities, deliverables, timelines, quality control, and quality assurance requirements for the study Work order/ Purchase order for subcontracted work is given in the order that shall be given to the agency after selection.

II. Discussion with the Client before finalization of the Terms of Reference and Review and approval of Terms of Reference through Management.

III. Terms of Reference shall be given in the work order/ purchase order for the outsourced work & Forward the approved Terms of Reference to the Purchase Division for the issue of the Work order.

IV. Outsourced work as applicable shall be included in the EIA report as per the requirement of TOR, EC, and respective TM and mentor. This shall be decided by the EC and the management is case necessary. Wherever outsourced work is used, it is given in the EIA report in the applicable format.

5.5. Ensuring the quality of the outsourced work

Quality of outsourced work is established by verification of data with other sources, site visits in the outsourced area, review of work with competent agencies.

This would involve the following steps:

- EIA Coordinator and Functional Area Experts (FAEs) shall ensure compliance with the Terms of Reference and quality assurance for the work done.

- In-house Quality control checks shall be undertaken by the FAEs

● Investigation/analysis of deviations if observed by the FAEs related to data/reports submitted by the agency.

Quality Control and performance analysis will be undertaken by the respective FAEs as per defined criteria and quality control procedures as mentioned above. When deliverables are found to be outside the criteria, action shall be taken to address non-conformance.

5.6. Extraction of Relevant Portions of Outsourced for inclusion in the EIA Report

The reports received from outsourced agencies may contain many details, statements that may not be so relevant for the EIA-EMP reports. The FAE shall be responsible to prepare a summary of the report containing only relevant portions like project impacts, Conservation/mitigation/monitoring plan, budget, etc. for inclusion in the EIA report. The Concerned EC shall study the full report as well as the summary prepared by the FAE before inclusion in the EIA. The detailed study report shall be appended as an Annexure to the EIA & EMP report.

6. Records:

S.No.	Document Name	Document Number
1	Study report (Name of study)	Reference number of Outsourced agency

QP012 LABORATORY WORK FOR BASELINE DATA

1. Purpose

The purpose of this procedure is to implement a system of effective communication, collection, interpretation of data collected from the laboratory

2. Scope

This procedure applies to Samples collection, analysis and reporting.

3. Responsibility

Laboratory head and FAEs

4. Reference

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015.

SOP for Sample collection, preservation, transportation, coding, retention and disposal-**PRPL/SOP/TRANSP/001**

5. Procedure

5.1. Test Request to the Authorised Laboratory

I. The test request may only be placed to a competent lab (accredited as per ISO/IEC 17025:2017). This is usually subcontracted to sister laboratories accredited by NABL as per ISO/IEC 17025:2017 namely M/s Perfact Researchers Pvt Ltd, New Delhi based on the assessment of the office, NABL scope, and the facility and timeliness of delivery of the lab.

II. As per the requirement of the TOR/ EAC/ FAE/EC or other team members for the preparation of the EIA/EMP report, the project in charge (PI) shall give a test request form to the authorized lab for the collection of baseline data.

III. The test request form shall be carefully filled by the project in charge for the requirement of WP, AP, AQ, EB, SE, SC, and SHW expert with final views of EC

IV. The deadline to the lab and the quality control procedure to the lab shall be given at this stage. This has been annexed as per Annexure A-3 of this manual.

V. Collection, preservation, and transportation of samples from the site to the laboratory

VI. The expert shall ensure the proper data collection and sample preservation and transportation of the samples from the site to the laboratory. To ensure the expert needs to visit the site during data collection and also to recheck the transportation means of samples to be transported and then received at the laboratory as per the LAB SOP for sample collection, preservation, and Transportation.

5.2. Quality Assurance of the Data

I. Data from the physical parameters are sent to FAE and are sent by the PI for verification, this is done to ensure that the data fit for EIA and is as per the requirement of the expert.

II. Experts also verify the soundness of data and match it with the secondary data (books, research papers, etc) for the data validation. After validation, the lab is informed of the soundness of data and they release final reports.

III. FAE(s) document their reports for incorporation to EIA based on the data from the laboratory and their own field experience.

5.3. Primary data collection and data validation

To ensure the authenticity of the primary data collected from the sampling sites following points are being followed

- **Pre sampling preparedness**

Sampling Plan

1. Sampling site selection criteria will be decided based on the environmental sensitivity, probable receptors (human settlement, flora, and fauna), local meteorology, land use/ land cover, location of water bodies, etc.

2. The number of samples to be collected will be decided by studying the type of project, TOR conditions, site representativeness, and geographical terrain around the project site Instrumental check

3. Working conditions of all the laboratory equipment to be verified

4. Pre seasoning/ decontamination/ sterilization of collection units, ice boxes, etc will be conducted with standard procedures

During Sampling

1. All precautions will be taken while conducting sampling to prevent any contamination in samples

2. Any deviation from any sampling plan procedure will be priorly discussed with

experts and changes will be incorporated accordingly

3. Samplers will be handled only by the trained personals taking all the precautionary measures

4. Samplers will be placed on-site following all the standard guidelines given by authorized governmental bodies

5. Samplers will be decontaminated from environmental contaminants before and post every sampling event

6. Samples will be transferred between lab and field following all the precautionary

measures.

Laboratory analysis

1. The samples collected from the sampling site will be opened only under laboratory conditions and in presence of an authorized laboratory technician

2. The analysis will be carried out within the period as given in standard guidelines and duly validated.

5.4. Type of records to be maintained by the laboratory and the EIA team

The Lab is maintaining the field data sheet of baseline data collected. The site photographs covering the core and buffer zone data with all the relevant information also collected by the laboratory.

The EIA Team/Expert is maintaining the site visit reports of individual experts in the formats available **(PESPL/FAE_SHEET /001-011).**

6. Records:

S.No.	Document Name	Document Number
1	Test report	Reference of Lab report

QP013 COMPLAINTS AND APPEALS

1. Purpose

To lay down a procedure for handling customer complaints and Appeals.

2. Scope

This procedure applies to Client and Authorities related to the EIA

3. Responsibility

HOD/EC/Management

4. Reference

QCI – NABET Scheme for Accreditation for EIA Consultant Organizations, Version 3 – June 2015.

5. Procedure

5.1. Informing the clients about the provision of complaints and appeals:

Clients are informed about the provision of registration of Complaints and appeals through feedback email id and Website.

5.2. Registrations of Complaints and Appeals

I. All quality-related customer complaints and appeals (External or Internal) are registered Verbally, telephonic, by email, Website, or any available means, and acknowledgments are given to the customers/ complainant/appellant.

II. After registration or admission, the complaint or appeal is being handled by the admin support desk at the 1st level before being forwarded to the respective Section Incharge for the 2nd level of support (if not solved at the 1st Level)

III. The Management Desk is also informed about the complaint or appeal and shall be recorded in the format: PESPL/QMS/QF/26/00

COMMENTS OF CLIENTS/EAC/SEAC/ OTHER STATUTORY AUTHORITIES

I. HOD/EC will acknowledge the receipt of comments to the client ensuring action

within a specified period.

II. Comments or clarification sought by the client /EAC/SEAC /Other Statutory authorities; their follow up & lesson learned shall be recorded in the format PESPL/CAPA_NABET/001

III. HOD will discuss the comments received from client /EAC/SEAC /Other Statutory authorities with the EC/concerned FAE.

IV. After thorough discussions and deliberations, corrective action will be finalized defining the action to be taken, Resources required and the person responsible to incorporate the comments within the committed time frame.

V. HOD/EC will monitor the status of client comments regularly or on a monthly basis. VI. Critical comments or lessons learned shall be discussed in the management review meeting and can be called up depending upon the severity.

5.3. Investigation

I. If not solved at the 1st level – the admin support desk, the complaint is forwarded to the 2nd level support – the respective Section Incharge for investigation and reporting the investigation detail.

6. Records:

S.No	Document Name	Document Number
1	CAPA (NABET/EAC/Customer feedback)	PESPL/QMS/QF/26/00

Annexure 1 - QUALITY POLICY

PERFACT ENVIROSOLUTIONS PVT LTD

QUALITY POLICY

PESPL is committed to delivering enhanced and up-to-date environmental consultancy services to all its customers by leveraging its expertise, organizational knowledge, and a robust process of continual improvement.

PESPL commits to maintain quality up to international standard in all documented outcomes, ensuring compliance, accuracy, and timely delivery. This is achieved through a structured internal review mechanism and SMART objectives that are carefully evaluated by management and effectively implemented by our team of experts.

PESPL ensures that quality objectives, goals, and targets are consistently formulated, reviewed, and adhered to on a recurring basis. Our management, quality cell, managers, and employees are dedicated to ensure that this policy and our objectives are well understood within the organization and effectively communicated to all stakeholders.

PESPL assures total satisfaction to all its customers through its systematic procedures and clear communications that lead to a seamless understanding of the requirements and deliverables.

Quality Manager 25/12/2024

Chairman 25/12/24

Perfact Envirosolutions Pvt. Ltd.
New Delhi

Annexure 2 - SOP

Annexure-2

Edition: 03
Revision: 02
Revision Date: 31/01/2023

STANDARD OPERATING PROCEDURES

(SOP)

Prepared by

Perfact Envirosolutions Pvt Ltd (PESPL)

TABLE OF CONTENTS

Issued By	STANDARD OPERATING PROCEDURES	Doc No: PESPL/FAE/SOP/01
PERFACT ENVIROSOLUTIONS PVT LTD	Preparation of FAE report for Air Quality	Rev No.: 01
		Issue Date: 03/05/2021

1.1 Introduction:

Atmospheric Dispersion is Modeling is an advanced dispersion model for calculating concentrations of pollutants emitted both continuously from point, line, volume and area sources, or discretely from point sources. The model includes algorithms which take account of the following: effects of main site building; complex terrain; wet deposition, gravitational settling and dry deposition; short term fluctuations in concentration; chemical reactions; radioactive decay and gamma-dose; plume rise as a function of distance; jets and directional releases; averaging time ranging from very short to annual; condensed plume visibility; meteorological preprocessor.

1.2 Objective:

To estimate and study how the air pollutants from different sources are dispersed into the atmosphere.

1.3 Responsibility:

Field Area Expert (FAE), Functional Area Associate (FAA) to have the complete understanding of air quality dispersion and its impact on the environment with mitigation measures.

1.4 Procedure

Following are the action plan which are taken into account for the preparation FAE reports:

1.4.1 Selection of team

- The project is assigned to the project incharge by the team head
- The team consists of members: EIA coordinator, project incharge, FAE, FAAs and air monitoring team from the laboratory.

1.4.2 Coordination with EIA coordinator

- The coordination meeting is planned after the data sheet is prepared in detail by the EIA coordinator once all the relevant information is received from the client required to make the EIA/FAE report.
- The coordination meeting is held between the EIA coordinator, FAEs, FAAs,project incharge and the monitoring team head.
- The coordination with the EIA coordinator is followed by the Email sent by the project incharge to brief about the project details that are discussed in detail at 4 different levels (0 level,1st level,2nd level,3rd meeting) depending upon the project type and is also updated at the trello board.
    I. **Level 1:** Location and environment sensitivity,critical points of the project, sampling plan,target list are proposed
    II. **Level 2:** Specific TOR points are brought into consideration, site visits are planned, impact and mitigation of the project are discussed for the better understanding of the subject .
    III. **Level 3:** Discussion about FAE reports.

- Further,the project incharge shares the above mentioned information about the project including technical details of the project,datasheet, standard TOR granted to the proposal, KML,and the toposheet to the respective FAEs and FAAs through the mail or trello update.

1.4.3 Study of the project details like datasheet,location on toposheet and KML

- Study & understand the subject, and project details
- Study & understand the environmental settings in respect of topography, habitations near the site, type of probable emissions from the site and nearby site etc., from Google Earth map, technical details and sources of emission.
- The sampling plan is structured keeping in mind the locations in upwind and downwind direction from the project site.
- The locations are then marked on the toposheet and KML to understand the number of receptors covered for air quality monitoring.

1.4.4 Site visit for field information

- Initial site visit with one or more FAEs,EIA coordinator, and project incharge to understand the local environmental conditions and understand the impact due to different air emission sources including point and nonpoint sources.
- During the detailed visit done by the monitoring team, sampling should be done in such a way that the receptors selected for the air monitoring are following the basis of the CPCB guidelines and should follow these criteria:
- Eg: The site should be away from major pollution sources, it should be away from absorbing surfaces,all the sides should be open,height of the inlet of sampler must be 3 – 10 m above

the ground level,the sampler must be more than 20 m from trees,there should be unrestricted airflow in three of four quadrants etc.

- The short note is made to understand the pollutant emission characteristics.The site visit report is maintained that includes the type of pollutants that areemitted which depends upon the type of the industry.

Thermal Power Plants:- SO_2, NOx, PM 10, PM 2.5, Hg

Oil Refinery:- SO_2, NOx, PM 10, O_3, Benzene, Ni

Steel Plants:- SO_2, NOx, PM 10, Benzo(a) Pyrene

Pharmaceutical Industry:- SO_2, PM 10, Benzene, NOx

Pesticide Industry:- SO_2, NOx, PM10, Benzene

Cement Plant:- PM10, PM 2.5, SO_2, Ni

Distilleries, Sugar Industry:- PM10, SO_2, Nox

Questionnaire for Air quality dispersion

Name Of Project		
Address Of Project		
Project Category As Per Eia Notification 2006		
Sources Of Air Pollution Identified (Dg(S), Boilers, Roads, Haul Roads, Pits Etc.)		
Total Lease/ Plot Area		
Site Location		
Utm (N)		
Utm (E)		
Utm Zone		
Elevation Base		
Details Of Project		

Nearest Road		
Width Of Road		
Nearest Town		
Maximum Building Height		
Total Area Of The Project		
Details Of Sources		
Roads (Nonpoint)		
Length (M)		
Width (M) (Minimum Width) (Use Google Earth In Case Not Available)		
Utm (N) (Start)		
Utm (E) (Start)		
Utm (N) (End)		
Utm (E) (End)		
Elevation (M)		
Emission Rates (G/S)		
PM10		
PM2.5		
SO2		
NO2		
CO		
Emission Hours		
Stacks (Point Sources (Vents, Chimneys Etc.)		
Remark Of Source (Dg?,Boiler? Fuel? Capcity In Kva Or Tph Etc.)		
Utm (N)		
Utm (E)		
Elevation (M)		
Emission Rates (G/S)		
PM10		

PM2.5		
SO2		
NO2		
CO		
Diameter Of Top (M)		
Height From Ground (M)		
Velocity Of Flow (M/S)		
Flow Rate (M3/S) (Optional If Velocity Given Else To Be Given)		
Emission Hours		

1.4.5 Identification of environmental impact in the functional area depending upon the type of the project

- After the site visit is conducted to understand the impact due to all the possible sources, identification of environmental impact is done that depends upon the type of the project: pesticide industry, sugar industry,pharmaceutical industry, building and construction site,township and area development projects, mining projects,metallurgical industries, cement plants,synthetic organic chemical plant,common hazardous waste treatment,storage and disposal units, and biomedical waste treatment facilities.
- **For eg: To understand the impact of the pesticide industry on the air environment, expert needs to understand the activity and aspects associated with the project.**The activities which are related to the pesticide industry that poses majorly greater impact are: Pesticide manufacturing operations(gaseous emissions like VOCs and hydrocarbon), operation of machinery including DG sets,Boilers(emission of pollutants NO_2,SO_2,PM) etc, transportation

of raw materials finished product (NO_2,SO_2,PM10,PM2.5 and CO).

1.4.6 Study of the most effective mitigation measures to control the impact the project site.On the basis of the impact

- Depending upon the type of the project, the mitigation measures are adopted keeping in mind the impact that the project poses along with the activities & aspects associated with it.
- Eg: For construction projects the mitigation measures adopted are water spraying at the dust generation point through water sprinklers, and development of green area in the periphery of the project site.
- For pesticide industries: Spillage is managed by detection of leaks in the first place from structures or vessels to avoid emission of VOCs,
- ESPs used to reduce process emissions(PM) from boilers,
- Bag filters are used to control emissions
- The air quality model(AERMOD) is run through different scenarios where concentration of the pollutant is approximated in the worse condition, normal condition and with the control measures adopted.

1.4.7 FAE report preparation:

The **input parameters** used in the model are:

- The location of the project and the sources: latitude and longitude
- Source description- Point source,area source, volume source,nonpoint source.
- AERMOD ready Meteorological data of the particular station

- Receptor details
- Terrain details which describes the elevation of the project site
- Methodology used with description of above input parameters & characteristics of sources.
- Scenario study
- Output file in the form of isopleths

The **structure of the report** consist of following points:

- About the environment legislations
- Understanding of the project location, its nearby and adjoining areas and meteorological data.
- Model description (AERMOD 9.9.0) which is a mathematical model to understand the dispersion of the air pollutants from the sources
- The comparison of the primary data with the secondary literature available in the research papers,articles, government websites, ebooks etc.
- All the possible sources of the emission during the whole process: stack source and non point source and details of receptors & its location from the project including distance and concentration of the pollutant.
- The type of gases emitted from the sources:SO_2,NO_2,PM2.5, PM10,CO,VOCs, Benzene and hydrocarbons.
- The environmental impact due to the sources on human health and the surrounding.Also to understand the impact through AQ modeling, the characteristics of the input parameters are studied: type of fuel used, its quantification, exhaust diameter,velocity,exit flow rate,height of the stack and emission rate.

- The mitigation measures adopted.
- Data interpretation that includes the discussion about the results that were obtained.

1.4.8 Report Compilation

The report is then compiled and is mailed to the EIA coordinator or the project incharge for their review and is then incorporated into the main EIA report.

Flow chart for primary data collection and handover of the information/data to team EIA :

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling locations for data collection.

After approval of the Sampling plan/locations by FAEs, TRF is filled by the Project in Incharge/Team head based on the sampling plan and shared with the Lab head.

The respective FAEs field data sheets filed by the field team is sent to HOD-Lab at L1; FAA/ FAE at L2 for further approval

If found ok by HOD/FAE then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

After the completion of fieldwork, the team prepares and shares a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers in a meeting called by them to the experts after Second Coordination Meeting

After issuance of the test report, Lab HOD hands over the Test report along with a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers to the Team Head for Briefing and Handover to the team and information of EC (EIA Coordinator)

SOP FOR SOIL CONSERVATION

Purpose

To lay down a procedure for the Preparation to predict the environmental impacts of the proposed activity and suggest mitigation measures.

Scope:

The document covers the methodology for the Preparation of the sampling plan in consultation with the experts (LU-Land Use & EB-Ecology and Biodiversity),Site visits for field information, identification of the environmental impacts from the proposed activity, and suggests mitigation measures.

Responsibility: - FAE/FAA.

Reference: CGWB, IARI

Procedure:

Selection of the team:

EIA coordinators select a team depending on the type of project which is studied and based on the experience of an FAE/FAA.

Interaction with EIA Coordinator:

A Coordination meeting is planned between the EIA coordinator, Project Incharge, and FAE/FAA. The following points are discussed:

- Brief about the proposed project.
- Location on KML and topo sheet and environment sensitivity, are critical points of the project. Discussion/Interaction with other related experts for identification of sampling locations.
- Specific TOR Points
- Time schedule to complete the work

Study of Project details :

The project site is located on toposheet and a 10 Km buffer zone is prepared and the KML of the Project Site is prepared.

The initial study is done with Site location on a topographic map, kml, and other secondary sources like CGWB report, etc. Through the initial study locations of sampling are decided with discussion with the FAE -LU and FAE -EB .

Site visit for field information/data:

The site visit is done by an FAE/FAA and the following information is collected and studied:

- Site Photographs
- Topography/Physiography of the area
- Land-use details (Core Zone)
- Drainage details (Core Zone and nearby areas)
- Classify area wise soil fertility indices based on the type of Land i.e. Barren, Agricultural Land, Forest Land, Vegetative Land soil fertility information.
- Nature and extent of contamination, contaminants of concern, historic activities that may be sources of contamination, and conceptual site model. List all present and past activities at the site that involves storage and production, use, treatment, or disposal of hazardous material that could contaminate the Soil.

Identification of environmental impacts:

To identification of environmental impacts from the proposed site assessment is considered the following elements:

- Understanding of the project location, its nearby and adjoining areas.
- All the possible sources of contamination during the whole process.
- The type (domestic waste, hazardous waste, biodegradable waste, or

non-biodegradable waste) and how are they stored.

- The comparison of the primary data with the secondary literature available in the research papers, articles, CGWB websites, etc.
- Ensuring that all potential impacts including those under abnormal/accidental conditions for various stages of the project are addressed with quantification.
- Analyzing and interpreting the baseline data collected; identifying and assessing potential impacts arising due to various project activities, products, and services during different stages of the project.

Study of most efficient & economical control measures:

The economic reasoning, analytic approach, and primary data supporting each value are discussed.
This report discusses each of the soil conservation benefit categories, the concepts behind their applications, and the interpretation of results.
The study is aimed at identifying the potential environmental impacts on soil due to the various project activities, assessment of impact, assessment of the associated risks, and developing an environmental management plan for the most efficient and economical mitigation are selected.

Preparation of FAE report :

The mitigation measures are suggested on the basis of the impact predicted for the upcoming project to see the present status of soil quality and the surrounding Impact assessment.
The report is then prepared and is mailed to the EIA coordinator or the project in-charge for their review and is then incorporated into the main EIA report. On the basis of data received from the Laboratory, project

site, and the surrounding stations, the result discussion.

Flow chart for primary data collection and handover of the information/data to team EIA:

A draft sampling plan is prepared by the FAE/FAA in the Initial meeting with the interaction with other Experts like LU& EB.

FAE submits a sampling plan to the project incharge/Team head. The project incharge/Team head then submits the final sampling request to the Laboratory associated.

The lab team presents a draft pre-visit sampling plan in the coordination meeting Level 1 and in the same meeting, the Expert can review the final sampling plan. If any Observations/Comments on the sampling plan are identified by the Experts are explained to the lab team in the same meeting itself.

In case some change is there then only the revised sampling TRF (Test request form) is shared with the Lab Team

The FAE plans his/her field visit during the Monitoring period or before the monitoring is conducted. The respective FAE field data sheet filed by the field team is sent to HOD-Lab at L1; FAA/ FAE at L2 for further approval

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary, and Tributary)

After the completion of fieldwork, the team prepares and shares a post-visit presentation including the Observations, Sampling plan executed with the Coordinates, site photos & field sheet numbers in a meeting called by them to the experts after the Second Coordination Meeting .

After issuance of the test report, Lab HOD hands over the Test report along with a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers to the Team Head for Briefing and Handover to the team and information of EC (EIA Coordinator)

Records: Field sheet/Site visit reports/FAE report

SOP for Noise & Vibration Level

Purpose

To lay down the procedure for preparation of Noise & Vibration report

Scope:

The document covers the methodology & procedures for preparation of Noise & Vibration FAE report

Responsibility: - Field Area Expert- Noise & Vibration

Procedure:

1. Team of FAA & FAE is selected for preparation of the report.
2. Team gets to interact with the EIA Coordinator to know the basic nature & details of the project.
3. Project details are studied by the team including datasheet, location on toposheet/kml.
4. Site visit is done by the team for field information, identifying the existing sources of noise & vibration and also from the activities of the proposed project.
5. Identification of the anticipated environmental impact on nearby surroundings due to the proposed activity of the project.
6. Analyse and interpret data as received from field monitoring and compare the data from the ambient air quality standards in respect of noise as mentioned in Noise Pollution (Regulation and Control) Rules, 2000.
7. After analysing suitable impacts from the project, study and suggest most efficient and economical mitigation measures.
8. Compile all the above information and the FAE (Noise & Vibration) report is prepared.

Flow chart for primary data collection and handover of the information/data to team EIA :

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling locations for data collection.

After approval of the Sampling plan/locations by FAEs, TRF is filled by the Project in Incharge/Team head based on the sampling plan and shared with the Lab head.

The respective FAEs field data sheets filed by the field team is sent to HOD-Lab at L1; FAA/ FAE at L2 for further approval

If found ok by HOD/FAE then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

After the completion of fieldwork, the team prepares and shares a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers in a meeting called by them to the experts after Second Coordination Meeting

After issuance of the test report, Lab HOD hands over the Test report along with a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers to the Team Head for Briefing and Handover to the team and information of EC (EIA Coordinator)

SOP FOR AIR POLLUTION MONITORING, PREVENTION & CONTROL

Purpose

The purpose of this SOP is to lay down a procedure to identify air polluting equipment/ machines and processes , Accidental potential that may cause Air polluting emissions , to device suitable monitoring procedure and instruments, predicting maximum cumulative emission possible, potential Air pollution impact the industry may receive from neighborhood industries , and based on the findings to recommend possible prevention techniques and or process alternatives, and to arrive at the pollution control devices , techniques and procedure as applicable to manage Air pollution in compliance with the requirement of Environmental Act and other statutory requirements such as CPCB / SPCB through preparation of Air Pollution monitoring , Prevention and Control as a part of EIA report

Scope:

Lay down the methodology & procedures for Air Pollution monitoring , Prevention and Control by a Functional Area Expert of EIA team

Responsibility: - Field Area Expert- Air Pollution monitoring , Prevention and Control

Procedure:

EIA coordinator forms a team of FAA & FAE for the assignment :

1. Team meeting to interact with the EIA Coordinator to know the project details and key areas of concern in the project.
2. Understanding and discussion on air pollution sources like activity, process and equipment/ machinery details of the project.
3. Project details are studied by the team and a data sheet is prepared; location of the project is noted from the toposheet/ kml file generated by LU team.
4. Google maps are used to locate the site and to understand the environmental sensitivity near the proposed project site; Industrial area/ CPI area. Study of other industries/activities in 500 m radius or similar industries.

5. Quantifying the air emission from different processes and activities. Study the control measures and give details to the AQ expert for assessing the GLC. If GLC is higher than standards then review the design details of control measures.
6. Thoroughly reviewing client's technical input on the proposed activities, Brainstorming with experts (in-house & client's) to suggest process alternatives , technology alternatives to eliminate or reduce emissions
7. Suggesting suitable AP control devices (stacks, chimneys, Scrubber, Neutralizer, cyclones, bag collectors) to curb the emission
8. Referring to sector specific guidelines on AP control and monitoring methods and procedures and that adopted in similar projects.
9. Plan for Site with a clear action plan of survey, and knowledge over existing processes and practices in case of an expansion project. The format of the field survey report is given below.
10. Identification of the anticipated environmental impact on nearby surroundings due to the proposed activity of the project. Likewise threats from external environment to the proposed project as already noted in your Action List
11. Analyse and interpret data as received from field monitoring done by laboratory , your visit, modelling studies carried out by AQ FAEs and compare the data from the secondary sources; Use statistical tools to verify accuracy of data obtained
12. Reference Secondary sources include PCB reports and Online monitoring devices in case if the site is located in Industrial , from neighborhood industries , Published research journals and EIA reports
13. After analyzing suitable impacts from the project, verify if the suggested APCDs are most efficient and economical mitigation measures.
14. Compile all the above information
15. prepare a draft FAE report (Air Pollution Monitoring , Prevention and Control) covering identified impacts, suggested mitigation measures and management of air pollution.
16. Discuss with the EIA -C and team members to get the report reviewed
17. Send the report to Client and get their review done
18. Prepare and submit Final FAE report(Air Pollution Monitoring , Prevention and Control)

Flow chart for primary data collection and handover of the information/data to team EIA :

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling locations for data collection.

After approval of the Sampling plan/locations by FAEs, TRF is filled by the Project in Incharge/Team head based on the sampling plan and shared with the Lab head.

The respective FAEs field data sheets filed by the field team is sent to HOD-Lab at L1; FAA/ FAE at L2 for further approval

If found ok by HOD/FAE then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

After the completion of fieldwork, the team prepares and shares a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers in a meeting called by them to the experts after Second Coordination Meeting

After issuance of the test report, Lab HOD hands over the Test report along with a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers to the Team Head for Briefing and Handover to the team and information of EC (EIA Coordinator)

SOP FOR HYDROLOGY REPORTS

Objective:

To lay down the procedure for assessment of hydrology and possible impact on it due to proposed project activities.

Responsibility:

FAE, FAA team members

Procedure:

1. Initial Study of the project Configuration

Initial Study of the project comprises ascertaining the location of the project, Latitude & longitude, availability of the secondary data of hydrology and hydrogeology.

2. Additional Studies identified through google and secondary sources

To study the 10 km area of the project With the help of KML, CGWB report of the district, Drainage Map and Topomap. Following are the parameters which can be known through the additional studies:

- Drainage of the area
- General slope of buffer area and core zone.
- Topography of the study area
- Groundwater development status of Blocks falling in the buffer zone.
- Water table depth of the area during pre-monsoon and post-monsoon.
- Details about the aquifers
- HFL of the area (if available on website)
- History of floods in the area, if any.

3. Interaction with the team and EIA Coordinator

To interact with the team for planning the site visit and collection of data.

4. Visiting the Site and Data Collection

Collection of primary data such as slope of the area, any drains to the nearby area of the project site, HFL, flood history of the area from local people, Depth of water table, Information on decreasing levels of water table. Understanding the rain water flow from the area and merger with the natural system. In case of mining projects, assessing whether mining is going to intersect the water table or not. Probable quantity of water to be discharged from the mining pit, its quality and possible use within or outside the project. Suitable areas for water recharge, if required.

5. Analysis of Primary Data and Secondary Data

Analyzation of data with the help of primary data and secondary data collected to develop a picture of present configuration of ground and surface water scenarios.

6. Identification of Impact and mitigation measures

After analysing the data received from the primary and secondary sources with the team the impacts, which can be generated due to the project are identified and mitigation measures are suggested to prevent/minimize the impacts.

7. Preparation of report

Following steps are followed to prepare the final report:

- Discussion of action plan & critical points during the reviews meeting for the preparation of report.

- Considering the above details a draft report is prepared with team members and discussed the same with FAE during the meeting.
- Incorporate inputs of FAE and submit the report to the EIA Coordinator.
- Attend the Coordination meetings for the suggestions on the report of EIA Coordinator.
- Finalization of FAE report.

Flow chart for primary data collection, Approval and handover of the information/data to EIA Coordinator:

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling/Primary data collection plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling locations for data collection.

The respective FAEs field data sheets filed by the field team is sent to HOD at L1; FAA/ FAE at L2 for further approval

If found ok by HOD/FAE then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

SOP FOR FAE (LU)

Selection of Team

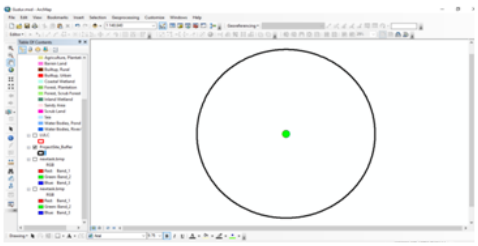
- Under the guidance of EIA coordinator selection of team.
- Plan a time frame for each internal meeting as well as meeting with clients.

Interaction with EIA coordinator

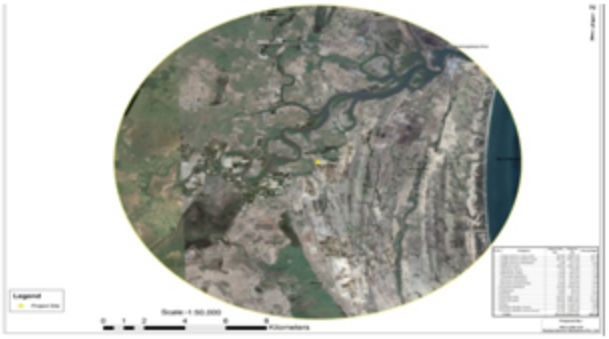
- Understanding of the overall project configuration with special reference to LU as a functional area expert.
- Review and understanding the project from Pre-feasibility report (PFR)/ Feasibility report(FR).
- Identify key elements of the baseline situation before visiting the sites.
- Identify and evaluate potential impacts/issues of concern of the ongoing activities at these sites.
- Interacting with the EC and other FAEs to get a holistic view of the EIA.
- Focused efforts on her/his specific functional area to identify the gaps and subsequently work towards addressing with other team members.
- Try to frame a time schedule to complete the work with coordination of EIA coordinator, another FAE'S and lab team.

Study of project reports like datasheet, location on topo sheet /KML

- Obtaining/ downloading the concerned toposheet from the client or specific site.
- Georeferencing of toposheet.
- Locate the project area in the toposheet .
- Preparation of KML file of the project site.
- Preparation of 10 km buffer zone



- Purchase Of Desired Imagery From NRSA / Download of Imagery from other sources

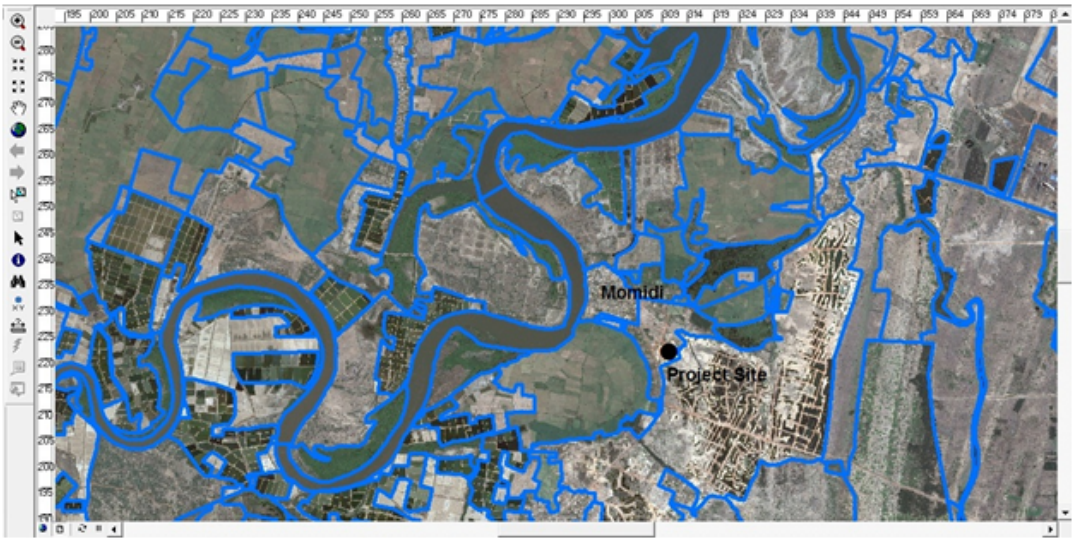


- Georeferencing of Image
- If single image is not available, then join two or more images and make a single image (Mosaic image)
- Clipping the image as per the shapefile
- Classification of the satellite imagery by creating polygons/ Cut polygon/ reshape polygon features for each land use class (Manual Digitisation)
- Coding of Features
- Refining of the imagery,
- Post classification processes like symbology, dataframe preparation.
- Extraction of the data into excel sheet and calculation of area for features
- Color code to Information

Site visit for field information data (Ground truth data)

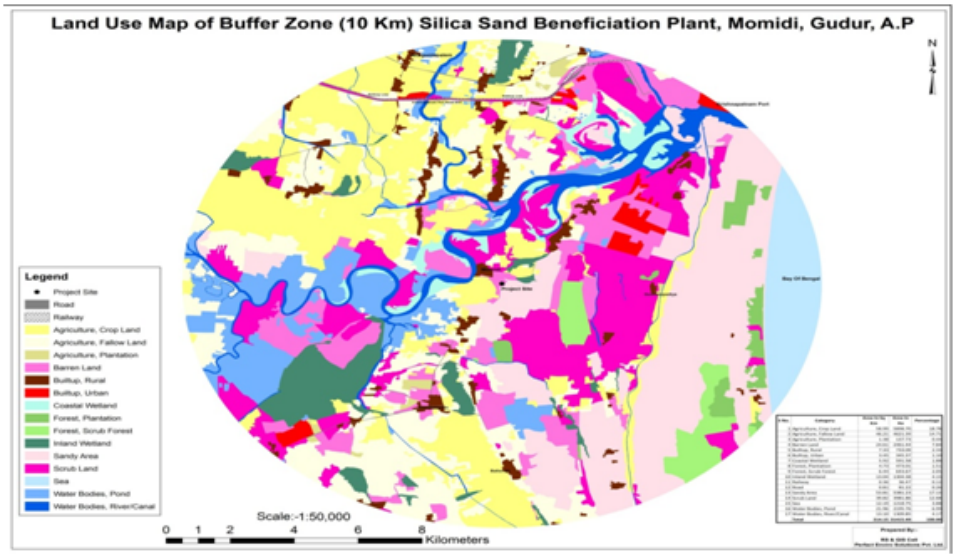
- Suggesting alternatives of location and designs for the project, if required.

- Site Photographs
- Topography/Physiography of the area.
- Land-use details (Core Zone)
- Drainage details (Core Zone and nearby areas)
- Geology of the area (Basically regional Geology)
- Mineral Reserve (In Mining cases)
- OB Storage place (In Mining cases)
- Method of Mining (In Mining cases)
- Dip & Strike of the mineral-bearing areas (In Mining cases)
- Water requirement for the project and Source of Water.
- Water level of the core zone.
- Ground truthing as per the category/ features mentioned in the map.
- Collect other relevant information which is not in the satellite image as sometimes the satellite image is old.



Updating of Landuse features using GIS software after field visit.

- Post processing (Symbology, Map preparation, Calculation of LULC categories Area,)



FInal Map after the correction imposed

Identification of environmental impacts in functional area.

- Ensuring that all potential impacts including those under abnormal/accidental conditions for various stages of the project are addressed with quantification, where applicable as per EIA guidelines to the specific sectors.
- Interacting with other FAEs to make sure that potential impacts on the other functional areas.
- Analyzing and interpreting the baseline data collected; identifying and assessing potential impacts arising due to various project activities, products and services during different stages of the project.

Study of most efficient & economical control measures

- Ensuring compliance to all TOR issued by MoEFCC/SEIAA pertaining to his area of expertise(LU).
- Addressing the issues raised during the public hearing in the specific functional area report.
- Ensure that project site is not located in the following areas:
    - Major floodplain.
    - Coastal Zone inundation areas.
    - Areas of unstable soil or subsurface conditions.
    - Areas of highly saline soils.

- Areas subject to landslides.
- Seismically or Volcanically active areas.
- Ensure that any involuntary resettlement is done in accordance with proper standards or consider alternate sites.

Preparation of FAE report

- Discussing, developing and submitting the functional area report with supporting tables, figures and photographs to the EC.
- Considering the above facts which are mentioned, we make a report and submit it to the EIA coordinator for discussion.
- Attending the review meeting to finalize the draft EIA report pertaining to her/his area of expertise.
- After discussion we incorporate the suggestions if any in the report & submit it to the EIA coordinator.
- Attend the final EIA meeting with the team at MOEF & CC.

Flow chart for primary data collection and handover of the information/data to team EIA :

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

The respective FAEs field data sheets filed by the field team is sent to EIA Coordinator for further approval

If found ok by EC then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from EC. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

SOP for the preparation of FAE Report- Solid Hazardous Waste (SHW)

1. The project is allocated by the EIA coordinator (EC) and the team including FAE of SHW is selected.
2. EC shares the brief details of the using DPR/Mine Plan/PFR of the project, Kml file, Toposheet through mail & trello.
3. Coordination meeting of all the FAEs/FAA with the EIA Coordinator is called for a better understanding of the project and the study area.
    - The project is discussed such as Site visit planning, data collection, sampling locations considering the 10 km buffer radius around the project site with the monitoring period.
    - Field survey details are planned on the basis of google earth & Topographical Map and shared with the monitoring team for the data collection.
4. Site visit is done along with the Monitoring team, EIA coordinator , FAA & Few FAE's. Data is noted in the field sheet.
5. The field sheet will give the details of solid waste site, recycling facilities, TSDF, CBWTF and Waste to energy plant in 10 km radius.
6. As per the process and activities in the project waste is characterized and quantified as follows:
    a. Domestic Waste
    b. Industrial Waste (Hazardous and non hazardous)
    c. Hazardous waste

d. Biomedical Waste

e. C & D waste

f. Battery Waste

g. E waste

7. The Secondary literature are referred for better assessment of characteristics of wastes in the report.
8. Preparation of waste management of each waste.
9. Then a report is prepared which includes following

- Description of the project location, its nearby and adjoining areas.
- All the possible sources of the generation of solid waste during the whole process.
- The type (domestic waste, hazardous waste, biodegradable waste or non biodegradable waste) and quantity of waste generated(Tonnes/day or tonnes/year) & how are they stored.
- The comparison of the primary data with the secondary literature available in the research papers,articles, government websites, ebooks etc.
- The environmental impact due to the sources on human health and the surrounding.
- The mitigation measure includes a treatment method or disposal method that can be adopted to control the level of impact due to the solid hazardous waste.
- Data interpretation and discussion on techno economic aspects of solid waste management.

10. The FAE report is mailed to the EIA Coordinator, FAA for their review.

11. To incorporate the comments received from the EIA Coordinator..
12. Mailing Final FAE report is mailed to the EIA Coordinator for incorporation in the EIA report.

Flow chart for primary data collection, approval and handover of the information/data to EIA Coordinator:

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling locations for data collection.

The respective FAEs field data sheets filed by the field team is EIA Coordinator for further approval

If found ok by EIA Coordinator then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field and to incorporate the comments received from the EIA Coordinator.

Final FAE report is mailed to the EIA Coordinator for incorporation in the EIA report

SOP for FAE in Function Area-Water Pollution Monitoring and Control Measures

EC to select the team to be involved in the proposed project in WP Functional Area for FAE & FAA/TM in coordination with FAEs.

↓

FAE to interact with the EC & other team members involved and understand the project specifications in reference to the WP functional area through the project report/details made available by the PP, environment sensitivity available through secondary sources like site location marked on Kml file & Topographical Map & datasheet prepared for the proposed project.

↓

Do a site visit alongwith the EC, FAA/TM in WP Functional Area and one or more FAE in other sectors as per the requirement. At site identify the sources of water and waste water generation in existing surroundings and probable sources if planned any.

↓

Assist the EC in the selection of water sampling locations, type & number of water or wastewater samples to be collected in core and buffer zone based on secondary data available and prior site visit done. After finalizing it through EC, place the request to an engaged approved laboratory for collection of baseline data through Test Request Form (TRF) along with the sampling locations marked on google earth/Topographical Map.

↓

During the samples collection of baseline data for surface water (like Ponds, Lakes, or Rivers), ground water (like Handpumps, Bore wells, Open wells, Dug wells, aquifers or springs), wastewater & treated water (STP/CSTP or ETP/CETP) as applicable, visit the site along with the monitoring team & also visit the approved laboratory engaged periodically during analysis to ensure the quality and validity of baseline data.

↓

On receiving baseline test reports from laboratory, verify the results obtained as per standards applicable & compare with secondary data (of the particular area & of the particular sector) for cross verification and inform the EC and Lab in case of any ambiguity. Also analyze and interpret the baseline data collected.

↓

Identify and assess potential impacts that may arise due to the proposed project with quantum during different stages of the project.

↓

Study the most efficient & economical water pollution control measures and accordingly suggest mitigation measures for each impact predicted.

↓

Develop the Environment Management Plan including water balance & wastewater treatment methodology, Monitoring plan, budget allocation, fresh & treated water standards to be met & responsibility for implementation of the same.

Interact with other FAEs to make sure that potential impacts of the other functional areas on the WP Functional Area have been addressed & fulfil the gaps identified.

Compile all the data ensuring compliance of Terms of Reference issued & addressing the issues raised during the public hearing as applicable and submit the final report prepared for WP Functional Area with supporting tables, figures and photographs to the EC for finalization of EIA Report.

Flow chart for primary data collection and handover of the information/data to team EIA :

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling locations for data collection.

After approval of the Sampling plan/locations by FAEs, TRF is filled by the Project in Incharge/Team head based on the sampling plan and shared with the Lab head.

The respective FAEs field data sheets filed by the field team is sent to HOD-Lab at L1; FAA/ FAE at L2 for further approval

If found ok by HOD/FAE then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

After the completion of fieldwork, the team prepares and shares a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers in a meeting called by them to the experts after Second Coordination Meeting

After issuance of the test report, Lab HOD hands over the Test report along with a presentation including the Observations, Sampling plan executed with Coordinates, site photos & field sheet numbers to the Team Head for Briefing and Handover to the team and information of EC (EIA Coordinator)

STANDARD OPERATING PROCEDURES	Doc No: PESPL/FAE/SOP/09
Socio-economic report	Rev No.: 01
	Issue Date: 28/05/2021

THE SE TEAM

Position	Name	Phone/Email ID	Responsibility
EIA coordinator (EC)			• Guide the team to find out the relevant indicators of the project. • To guide the SE team to identify the reasons which are contributing to high pollutant loads that may impact the area.
Functional Area Experts (FAEs)			• Having in-depth knowledge in SE • Having understanding of the SEIA process, legislations and rules/regulations with respect to the SE • Having the capability of identifying and assessing the potential impacts of the project, throughout its life-cycle, on the socio-economic aspects as applicable • Having the knowledge to suggest mitigation measures
Functional Area Associate (FAA)			• The objective is to encourage young and fresh candidates with no experience or less than 5 years of professional experience after acquiring minimum qualifications as required in the NABET.
Mentors			✔ To utilize their experience and expertise to train the functional area associates
ECs, AECs, FAEs, TMs, and FAAs shall maintain field logbooks of their visits to the site giving the observations, work done, etc., for the stated SEIA			

IMPORTANT NOTES REGARDING THIS DOCUMENT

- This Standard Operating Procedure (SOP) is intended to explain the objective, purpose, and procedure for the Socio-Economic Study.

- The SOP is intended for use by the SE team having a background in Social and Environmental science and they have been trained in preparing SE Reports.

- The SE study process is designed to be useful for the well-being of society with sustainable development.

- This SOP is the sole property of the Perfact Enviro Solutions Pvt Ltd.

TABLE OF CONTENTS

ABBREVIATIONS

SEIA	**Socio-economic impact assessment**
SE	**Socio-economic**
VSEC	**Valued socio-economic components**
CER	**Corporate environmental responsibility**

SOP FOR COLLECTION AND PREPARATION SOCIO-ECONOMIC

1.0 About the SOP

This SOP is for the preparation of the Socio-economic Impact Assessment Report of any proposed project/activities in a particular area. These procedures are meant to provide guidance for conducting the Socio-Economic survey & preparation of the Socio-Economic report. These also aim to help Functional Area Experts in the preparation of conducting social surveys and need-based assessment for preparation and implementation of CER at ground level.

2.0 Introduction

Socio-Economic Impact Assessment is the systematic tool used to identify and evaluate the potential socio-economic and cultural impacts of any developmental activities/projects on local communities/habitation/fields and many more. Social Impact Assessment helps to identify /reduce or prevent the potential significant adverse impacts. It can identify and distinguish the impacts due to proposed projects/activities. It also tends to show the people who are directly or indirectly affected due to the project activities. SIA focuses on the avoidance of adverse impacts and helps to plan how to maximize benefits from the proposed development.

2.1 Purpose of SOP

- To lay down a procedure for socio-economic impact assessment report of proposed developmental activity or project.
- To study the relevance of socioeconomic components in developmental activities and to find a sustainable and eco-friendly solution for society.
- It aims to help functional area experts for data interpretation and needs assessment for the implementation of CER at ground level.

3.0 The objective of SE reports

I. Identify relevant indicators.
II. Establish the baseline value of the relevant indicators for the project affected population.
III. Perform need-based assessment for the study area.
IV. Prepare mitigation or corporate environment strategy for the project to cover the needs of project-affected families.

4.0 Valued Socioeconomic Environment Components (VSEC)

Identification of Valued Socioeconomic Environment Components (VSEC) is one of the most important steps in the SEIA assessment process. It involves determining whether a proposed development is likely to cause significant adverse impacts on valued socio-economic components. If appropriate mitigation measures cannot be identified, a proposed development may not be approved. Based on the nature of

the proposed activity and the existing environment setting following VSECs have been identified for the present study, which can have an effect on surrounding communities/villages.

5.0 Approach adopted for conducting Socio- Economic Study

The selection of study areas is a very important process for Socioeconomic study. This process is based upon the areas in which the proposed project is going to be implemented. The selection process begins with the preparation of a toposheet having a boundary of a 10 Km radius from the project site.

So, to understand the study area (10 km Radius from the site) of the project, a Topographical map is studied and marked. From the Topographical map, the names of all the villages are extracted. All the villages lying within the study area are marked and studied further. The distance of different villages is incorporated within the report and is verified with the help of google earth.

6.0 Methodology

6.1 Types of data

The data needed for the socio-economic research can be broadly classified into

- Data pertaining to human beings.
- Dala related to the organization
- Data pertaining to territorial.

6.2 Identification of relevant indicators

Shall be decided by the EC and FAE in the coordination meeting subject to the project activity, envisaged valued Environmental components (VECs) identified by FAE along with the EIA coordinator; type of the nearby population and the environmental baseline scenario. It shall also be based on the expected duration/dispersion/extent and severity of the impact due to the project, project affected families shall be identified.

The relevant indicators as below may be selected on a project to project basis in the coordination meeting among the EIA coordinator and FAEs (L1 and L2)

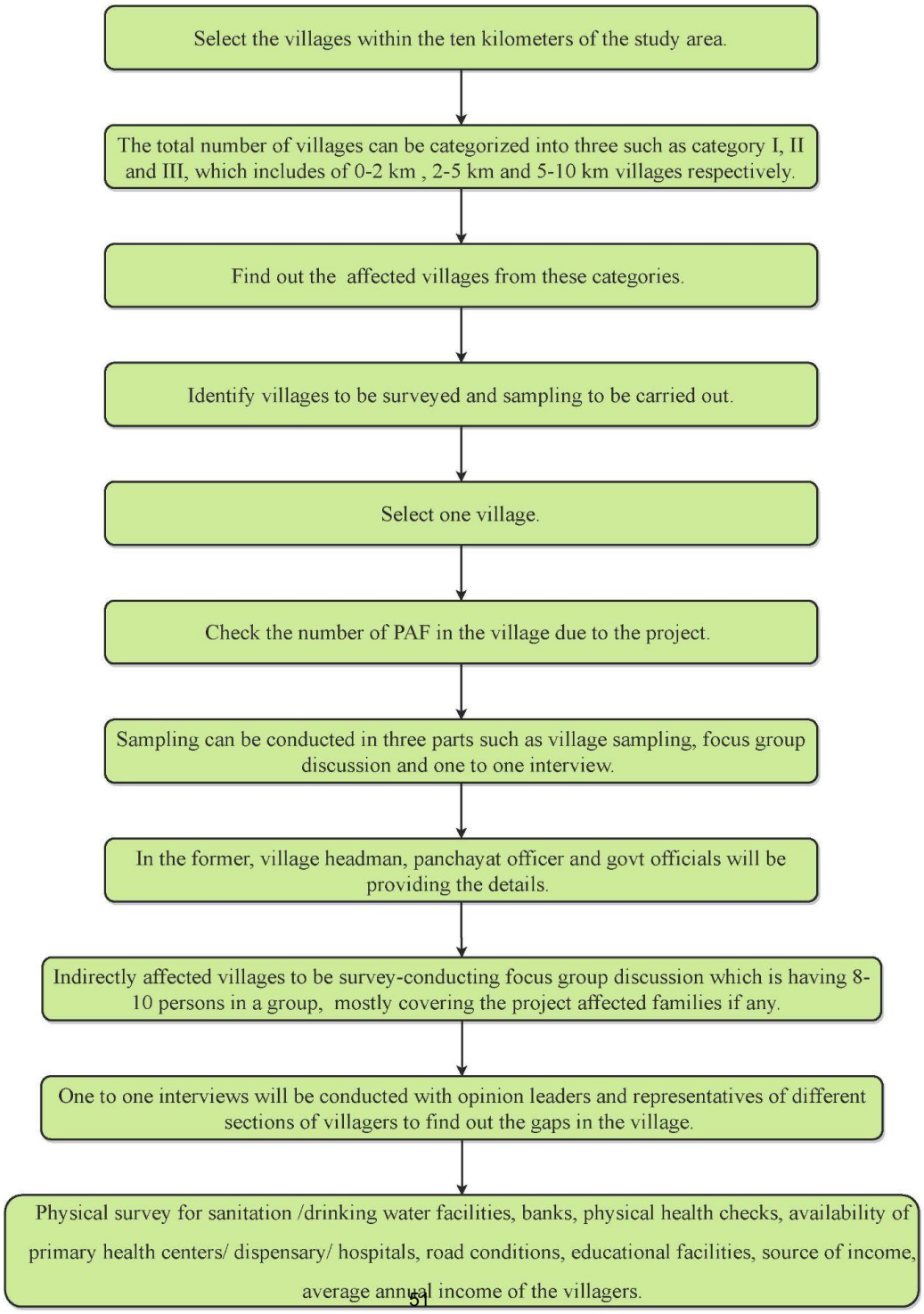
- Demographic (Population, Households, literacy, SC/ST/Other, Social Fabric)
- Infrastructure
- Economic
- Cultural and religious
- Health
- Education and skill level
- Livelihood including agriculture
- Air, water and soil quality
- Employment (Occupation, Workers)
- Crop yield and cropping pattern
- Transportation

6.3 Process flow diagram

A judgmental and purposive sampling method shall be used for choosing respondents of various sections of the society i.e. Sarpanch, adult

males, and females, teachers, medical practitioners, businesspersons, agriculture laborers, fishermen, unemployed groups, etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of research needs.

The process of collecting data using primary survey methods are as follows:



6.4 Sampling Method

The study was conducted in three parts which are described below:

1. The analysis of secondary data by referring to the Census of India data, 2011 and village directory. The exact status of amenities from different villages/towns are confirmed by the census data from the respective census district handbook for the villages coming in the radial distance of 10 Km from the project site.
2. The social impact assessment will be done by site specific survey through discussion with local villagers, project proponents and the head of the villages in surrounding villages coming under an area of 5 Km radial distance from the project site through prepared questionnaires. The villages coming under the buffer zone within radial distance of 10 Km from the project site are marked with the help of KML and listed further.
3. During the Survey, demands of the community were noted and will be implemented under the Corporate Environment Responsibilities by the project owner. The expected cost depends on the cost of the activities.

6.5 Data Collection and Analysis Method

Data collection is a term used to describe a process of preparing and collecting data, for example, as part of a process improvement or similar project. The purpose of data collection is to obtain information to keep on record, to make decisions about important issues, to pass the information on to others. Primarily, data is collected to provide

information regarding a specific topic. Data collection usually takes place early on in an improvement project and is often formalized through a data collection plan which often contains the following activity.

- Pre-collection activity — collecting general information regarding socio-economic, cultural and historical scenario of the area.
- Customizing the various data collection tools - data collection by using individual form, village form and FGD guide
- Present Findings — usually involves sorting and analysis to bring forth the desired outputs.

6.5.1 One to one discussion

The involvement and support of local people in efforts to define problems and incorporate local initiatives and ideas in the design and implementations. The success and sustainability of projects depend upon local understanding, approval, and participation in all aspects of the project cycle. One-to-one discussions will be carried out with village head/village level officers, opinion leaders from affected people, and someone from the deprived group.

6.5.2 Community Consultation

- To develop an understanding of the quality of life of the people residing in the study area;

- To solicit the views of communities, individuals on social, economic, and environmental components and the significance of impacts;
- Assessment of project impacts;
- To ensure enhanced public cooperation due to the creation of awareness about the purpose and benefits of the project;
- Development opportunities and initiatives;
- Mechanisms for monitoring and evaluation and for implementing corrective action.
- Assessment of the needs of the community and its prioritization.

6.5.3 Field survey and questionnaires

Field research involves the collection of primary data or information that is new. This is collected through surveys and questionnaires that are made out specifically for a purpose. Observations can be conducted on nearly any subject matter and the kinds of observations will depend on survey questions. Three different types of Questionnaires are mentioned in Annexure I, II and III.

6.5.4 Survey report

The demographic profile of the area is extracted from the Census of India, 2011. The demographic profile will give details about Households, Number of people, Male Population, Female Population, Total Literates, Male Literates, Female Literates, Sex Ratio, Schedule castes, and schedule Tribes. Apart from these, facilities available, Working

Population, Male workers, female workers, casual workers, marginal workers, etc are also extracted.

The survey report includes the division of the project area of 10 kilometer radius into three zones in which the impact is likely to be maximum. It is categorized into three categories and the demographic, other relevant profiles were also studied for the generation of comparative statements which is relevant to the project. Later, after studying the Demographic Profile of the study area, changes held in the area are verified by cross-checking the data collected from the field for these villages with secondary data collected from the census data extrapolated as on date by using following methods:

- Arithmetic increase method,
- Geometrical increase method
- Incremental increase method
- Simple graph method
- Semi log graph method.

6.6 Need-Based Assessment

Prior to formulation of social development interventions, area's profile is established in terms of socio-economic status (possession of immovable properties like houses, wells, ponds etc.), demography (details on the family members, age, sex, occupational, employment status and their sources of income), health &education status, water security, sanitation, waste disposal/management and the organizations, schemes, services available in the area. Identification of indigenous skill is an important aspect of the community assessment study. Skill development of local communities leads to

two-way benefits to the company. It adds efficient manpower as well as results in new livelihood opportunities, thus, strengthening the social development policy of the mining industry. However, it is of prime importance to assess their current capabilities.

Resource Assessment: Assessment of existing resource base which includes natural, financial, technical, infrastructure can be used to probe further future opportunities regarding livelihood, capacity building and financial linkages. Resource mapping, providing information regarding spatial distribution, also discusses the entitlements being enjoyed by the people inhabiting that zone, its utilization, preferences and constraints in accessing them.

Identification of social development needs: **Capacity building** has been strongly emphasized as a social development activity by the mining sector. It is defined as a process that assists communities to achieve social and economic development standards. Capacity building initiatives have the potential to foster community resilience and, therefore, increase the possibilities for mining companies to gain and provide sustainable outcomes for communities. This leads to **skill development** of local untrained communities and adds to new livelihood opportunities, especially for people living in rural mining areas. Subsequently results in livelihood generation. **Livelihood generation** is an important need when it comes to the rehabilitation of affected communities in mining areas. How social development investment can be directed or focused towards livelihood generation activities is important. Unless local capacities are enhanced, the communities would not be able to generate livelihoods for themselves especially in remote areas, implying emphasis on skill development work. Sustainability of these livelihoods can only be achieved through the hand-holding of the communities after skill development and the creation of new enterprises. It has been observed that

motivating local communities by means of entrepreneurship development programs/training/hand-holding facilities leads to community empowerment.

Community empowerment: Skill development of the local untrained communities is to foster entrepreneurship and vocational skills among members of local self-help groups (SHGs). This increases their access to economic opportunities leading to community empowerment. In case SHGs are non-existent, community mobilization should be identified regarding formation of SHGs. Frequent vocational training programs for these groups and refresher training on livelihood activities will assist in fulfilling our objective of the development of community.

ANNEXURE 1

Interviewer	
Date	

SOCIO ECONOMIC SURVEY (VILLAGE LEVEL)

A. Identification Data

1	Name of Village:			
2	Name of Respondent			
3	Designation of Respondent			
4	Contact No. of Respondent			
5	District			
6	Tehsil			
7	Gram Panchayat			
8	Number of Households		Particulars	Nos
		8A	Number of APL Households	
		8B	Number of BPL Households	
		8C	Total Population of the village	
		8D	No. of Females	
		8E	No. of Males	
9	Religion		Religion	Nos
		9A	Hindu (Nos.)	
		9B	Muslim (Nos.)	
		9C	Others (Specify) (Nos.)	
10	Caste		Caste	No. HHs
		10A	General (No. HHs)	
		10B	OBC (No. HHs)	
		10C	SC (No. HHs)	
		10D	ST(No. HHs)	

11	Connectivity		Connectivity		Length in Km
		11A	Distance from main road		
		11B	Kachha Road		
		11C	Metalled Road		
12	Type of House		Type of Houses		Nos
		12A	Pacca (Concrete) (Nos.)		
		12B	Semi Pacca (Concrete & Tin) (Nos.)		
		12C	Kutcha House (Mud & Grass) (Nos.)		
		12D	Others (Specify) (Nos.)		
13	Toilet Availability		Toilet Availability		Nos.-HH
		13A	Individual toilets (Nos.-HH)		
		13B	Public Toilets (Nos HH.)		
		13C	None -Open Defecation (Nos HH.)		
14	Institutions/ Educational Facilities		Institutions/ Educational Facilities	Within Village; Yes/No	Distance in km , if No
		14A	Anganwadi		
		14B	Primary School		
		14C	Middle School		
		14D	High School		
		14E	College		
		14F	Others (Specify) (Nos.)		
15	Medical Facilities		Institutions/ Health Facilities	Within Village; Yes/No	Distance in km , if No
		15A	Sub-Centre		
		15B	Primary Health Centre		
		15C	Dispensary		
		15D	Private Clinic		
		15E	Private Nursing Homes		
		15F	Asha Workers		

16	Occupation in the village		Occupation		Nos.
		16A	Agriculture (No. of HHs involved)		
		16B	Service (No. of person)		
		16C	Shops (No. of person)		
		16D	Business (No. of person)		
		16E	Others (Specify) (Nos.)		
17	Drinking Water Source —No. of Households Dependent	Water source			No. of Households Dependent
		17A	PWS-Individual		
		17B	PWS Community		
		17C	Hand Pump		
		17D	Tubewell		
		17E	Spring Water		
		17F	Open Well		
		17G	River/Pond etc.		
18	Roads within village (km)		Roads within village (km)		Length in Km
		18A	Good road		
		18B	poor Road		
		18C	Worst road		
19	Vehicles owned by villagers			Yes/No	No. of vehicle if yes
		19A	Truck		
		19B	Tractor		
		19C	Bullock cart		
		19D	Scooters		
		19E	Bicycles		
		19F	Cars/ Jeep		
		19G	Tempo		
		19H	Dumpers		

		19I	Others		
20	Means of Communication				Approx nos
		20A	Telephone		
		20B	Mobiles		
		20C	Post Office		
21	Public Utilities	21A	Banks		
		21B	ATM		
		21C	Public Toilets		
		21D	Community Hall		
		21E	Dharamshala		
		21F	Panchayat Office		
		21G	Police Station		
		21H	Government office		
		21I	Others		
22	Electrification Facilities	22A	Whether Electrified		
		22B	No of individual connections		
		22C	Whether street lights present		
		22D	Whether electricity available for Agricultural purpose		
		22E	Solar lighting		
		22F	Average daily duration of supply in hours		
23	Sanitation Facilities				Yes/No
		23A	Is there proper drainage available ?		
		23B	Individual Toilets (Soak Pit/Septic tank/Sewer line/ Others)		
		23C	Whether liquid waste is managed ?		
		23D	Whether solid waste is managed?		
24	Solid waste Disposal	24A	On-Land disposal		
		24B	Public Dustbin		

		24C	Composting		
		24D	Other		
25	Annual Income (Rs.)				
			Average income		
				Annual Average Income in Rs.	
26	Sources of Income	26A	Agriculture		
		26B	Wage Labour		
		26C	Animal husbandry		
		26D	Self Employment		
		26E	Private Job		
		26F	Government Job		
		26G	Pension		
		26H	Others		
27	Fuel used		Fuel Type	Yes/No	Source of Fuel (Market, Foret, Ag. Field
		27A	Kerosene		
		27B	Firewood		
		27C	Coal		
		27D	Bio Gas		
		27E	LPG gas		
28	List the nearby Industries		Name		Impact - Good & Bad
		28A			
		28B			
		28C			
		28D			
		28E			

29	Key Crops of the Area		Crop	% Area Covered	Av. Yield Q/ha	Av. Selling Price			
		29A	Wheat						
		29B	Paddy						
		29C	Oil Seeds						
		29D	Pulses						
		29E	Jwar/ Bajra						
		29F	Maize						
		29G	Sugar cane						
		29H	Potato						
		29I	Vegetables						
		29J	Others (specify)						
30	Disease Prevalence		Disease			%Suffering during last 6 months			
		30A	Diarrhea						
		30B	Dysentery						
		30C	Jaundice						
		30D	Gastroenteritis						
		30E	Typhoid						
		30F	Others-Specify						
		30F1							
		30F2							
		30F3							
		30G	Tuberculosis						
		30H	Bronchitis						
		30I	Asthma						
		30J	Pneumonia						

		30K	Others-Specify						
		30K1							
		30K2							
		30K3							
31	Availability of Skills in the Village		Type of Skills			No. in Village			
		31A	Mason						
		31B	Carpenter						
		31C	Blacksmith						
		31D	Mechanic						
		31E	Electrician						
		31F	Weavers						
		31G	Artisans						
		31H	Others-Specify						
		31H1							
		31H2							
		31H3							
32	Farmer Category		Category				No.of Household		
			Marginal Farmers - less than 1 ha. (2.5 acre)						
		32B	Small Farmers - > 1 ha. and <=2ha.						
		32C	Medium Farmers - > 2 ha. and <=4ha.						
		32D	Large Farmers - > 4 ha.						
33	Are villagers aware about the project			Yes /No					
34	Are they in favour of the project			Yes /No					

35	5 Most Important problems/ Gaps in village		Issues with approx cost of intervention
		35A	
		35B	
		35C	
		35D	
		35E	
36	Suggestions, if any		
		36A	
		36B	
		36C	
Name & Signature of the interviewer:			
Name and Signature of Representative			

STANDARD OPERATING PROCEDURES	Doc No: PESPL/FAE/SOP/10
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STANDARD OPERATING PROCEDURE OF ECOLOGY & BIODIVERSITY

Purpose: The purpose of the preparation of an Ecology and Biodiversity report is to identify and assess the potential impact of proposed activity on ecology and Biodiversity with mitigation measures.

Scope: The biological study of the area is conducted in view of the TOR of the project and in order to understand the ecological status of the existing flora and fauna of the area to generate baseline information and evaluate the probable impacts on the biological environment.

Responsibility:

Position	Name	Phone/Email ID	Responsibility
EIA coordinator (EC)			• To guide the EIA team on ecological aspects
Associate EIA coordinator			
Functional Area Experts (FAEs)			• Having in-depth knowledge in EB • Having understanding of the EIA process, legislations and rules/regulations with respect to the EB • Having the capability of identifying and assessing the potential impacts of the project, throughout its life-cycle, on the

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			biotic and environment as applicable ● Having the knowledge to suggest/vet mitigation measures
Functional Area Associate (FAA)			● The objective is to encourage young and fresh candidates with no experience or up to 5 years of professional experience after acquiring minimum qualification as required in the NABET. ● ----------FAE/mentor is permitted to guide FAAs.
Mentors			● To utilize their experience and expertise to train the functional area associates
ECs, AECs, FAEs, TMs and FAAs shall maintain field log books of their visits to the site giving the observations, work done etc., for the stated EIA			

Procedure:

There are basically two procedures being adopted I) Primary Survey & II) Secondary Survey. The details are described below;-

1.0 PRIMARY SURVEY

1.1 Primary Survey for Flora: Floral composition of the area gets evaluated through primary survey (including project specific questionnaire). For the primary survey core zone area (within premises) and buffer zone area (10 Km radius) divided in view of existing natural vegetation and Rivers and Ponds in vicinity followed by the random sampling method, surveys, exploration, collection, and preparation of specimens toward building an inventory of floral diversity of the area.

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1.2 Primary Survey for Fauna: For study of fauna species local community assistance, standard transect walk, visual encounter survey preferred at different timing during and night. Seasonal variations also studied.

2.0 SECONDARY SURVEY

Reference: Secondary data: Compilation of secondary data with respect to the study area from web literature, review of published research articles available with various government agencies. The key areas of review are as below;

Sr. No.	Organizations/Convention	Literature/Website
1.	Forest Department	Working Plans
2.	Ministry of Environment, Forest and Climate Change (MoEFCC) Guidelines	The Official Website of Ministry of Environment, Forest and Climate Change, Government of India (moef.gov.in)
3.	ENVIS Centre on Wildlife & Protected Areas	http://www.wiienvis.nic.in/Database/Protected_Area
4.	CPCB guidelines	
5.	Champion & Seth Book	
6.	IUCN Red Data Book	https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species
7.	CITES	https://cites.org/eng
8.	Indian Biodiversity Portal	https://indiabiodiversity.org/theportal
9.	Ramsar Convention	https://www.ramsar.org/wetland/india
10.	The Convention on Wetland of International Importance	

11.	The Convention on the Conservation of Migratory Species of Wild Animals	
12.	The Convention on Biodiversity	
13.	Indian Forest Act, 1927	
14.	Wildlife (Protection) Act, 1972, 2002	
15.	Forest (Conservation) Act, 1980	
16.	The Biological Diversity Act, 2002	

METHODOLOGY

- ✔ Identification of Bioindicators of the project area
- ✔ Species composition of flora and fauna including endemic, indigenous, rare, endangered, threatened species.
- ✔ Flora –Phyto-sociological parameters (type, density, frequency, etc.)
- ✔ Fauna -distribution, abundance, rarity, migratory, species diversity, habitat requirements, habitat resilience, economic significance, commercial value, etc.
- ✔ Fisheries – migratory species, species with commercial/ recreational value, etc.

Methodology for Terrestrial Floral Study:

- ✔ Depending upon the vegetation & size of the area, two methods were adopted for survey [Michael (1964), Trivedi et. al (1987) and Odum (1971)].
- ✔ Belt Transect Method.
- ✔ Plot Quadrate Method.

1.1.1 Belt Transect Method:

Belt transects are used in determining and understanding the gradual change in abundance, dominance, frequency and distribution of different species in the transitional region between two different types of vegetation.

Plot Quadrate Method: The quadrat is a square sample area of varying size marked-off in the plant community for the purpose of detailed study. Generally a number of quadrats are studied to acquire reasonably faithful data to realise different analytic and synthetic characters of the plant community.

It is also effectively used to determine the exact differences or similarities in the structure and composition between two or more plant communities of related or unrelated vegetation.

Phytosociological Parameters for Terrestrial Ecology Study: The various phyto-sociological parameters were calculated as given below:

Density: it was calculated as plants / m2 by using Quadrate method.

$$\text{Density} = \frac{\text{Total number of individuals of a species}}{\text{Total number of quadrats studied}}$$

Diversity: Diversity was calculated with the help of Shanon & Weaver (1948) diversity index.

$$H = -\sum Pi \log e\, pi$$

Where, Pi = n/N

n= No. of individual species.

N= Total No. of species.

$$\text{Frequency} = \frac{\text{Total number of quadrats in which species occurred}}{\text{Total number of quadrats studied}} \times 100$$

$$\text{Abundance} = \frac{\text{Total number of individuals of species in all quadrats}}{\text{Total number of quadrats in which species occurred}}$$

$$\text{Relative Frequency} = \frac{\text{Frequency of the species}}{\text{Total frequency of all species}} \times 100$$

$$\text{Relative Density} = \frac{\text{Density of the species}}{\text{Total density of all species}} \times 100$$

$$\text{Relative Abundance} = \frac{\text{Abundance of the species}}{\text{Total abundance of all species}} \times 100$$

Importance Value Index (IVI): The frequency, density and cover are all important parameters for the study of a community in their own right.

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IVI= Relative Frequency + Relative Density + Relative Dominance

The value of a species is less than 300

Records: Field sheet/Site visit reports/FAE report

Study Tools

Sr. No.	Items
1.	Project specific checklist
2.	Measuring tape
3.	Blotting paper
4.	GPS Instrument
5.	Quadrate
6.	Plankton Net with bottle
7.	Sampling vials
8.	Preservatives
9.	Polythene/containers
10.	Marker/slips for sample coding
11.	Field Log Book

SAMPLE PROJECT CHECKLIST

Sr. No	Checklist	Status
1)	Is field team oriented on data/information to be collected and list is available with them [Yes/No]	
2)	Is Stakeholders list finalised for the consultations [Yes/No]	
3)	Is the consultations questionnaire shared with team [Yes/No]	
4)	Is marked Map of Core Zone & Buffer Zone of study area is available with team[Yes/No]	
5)	Is there protected sites, areas, features within study area [Name them & Highlight on Map]	
6)	Is there any rare, threatened, endangered species reported within study area [Yes/No, (if yes list them)]	
7)	Is there any Schedule I species within study area [Yes/No, (if yes list them)]	
8)	Is there any endemic species [Yes/No, (if yes list them)]	
9)	Is there any invasive species within study area [Yes/No, (if yes list them)]	

10)	Is there any habitat of species within study area [Yes/No, (if yes list them)]	
11)	Is there any migratory root of species within study area [Yes/No, (if yes list them)]	
12)	Is there any water body within study area [Yes/No, (if yes list them)]	
13)		

Format for Recording of General Flora in Study Area

Sr. No	Core Zone		Buffer Zone	
	Common Name or Scientific Name of The Species	Status (Abundant, Average, Occasional)	Common Name or Scientific Name of The Species	Status (Abundant, Average, Occasional)
TERRESTRIAL FLORA				
Trees				
Herbs				
Shrubs				
Grass				
Climber				
AQUATIC FLORA				
Macrophytes				

Remark: Pl Record all Species on Separate Register

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Format for Quadrate Method

Name of the Species	Occurrence in Quadrates										% age
	1	2	3	4	5	6	7	8	9	10	
A	✔	x	x	✔	x	x	✔	x	x	✔	
B											
C											
D											
E											

Remark:

✔ **Presence of the species**

X Absence of the species

Sample Vegetative Details Sheet using Belt Transect Method

S.No.	Name of Species	Distance (ft.)	Height (ft.)	Canopy (ft)	Circumference (ft.)
POINT No. 1					
LEFT					
1	***Pl fill Species Names***				
2					
3	*So on*				
RIGHT					
1					
2					
3					
POINT NO. 2					
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 3					
LEFT					
1					
2					
3					
RIGHT					
1					
2					

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S.No.	Name of Species	Distance (ft.)	Height (ft.)	Canopy (ft)	Circumference (ft.)
3					
POINT NO. 4					
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 5					
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 6					
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 7					

S.No.	Name of Species	Distance (ft.)	Height (ft.)	Canopy (ft)	Circumference (ft.)
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 8					
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 9					
LEFT					
1					
2					
3					
RIGHT					
1					
2					
3					
POINT NO. 10					
LEFT					
1					

S.No.	Name of Species	Distance (ft.)	Height (ft.)	Canopy (ft)	Circumference (ft.)
2					
3					
RIGHT					
1					
2					
3					

Format for Recording of General Fauna in Study Area

Sr. No	Core Zone		Buffer Zone	
	Common Name or Scientific Name of The Species	Status (Abundant, Average, Occasional)	Common Name or Scientific Name of The Species	Status (Abundant, Average, Occasional)
TERRESTRIAL FAUNA				
Mammals				
Reptiles				
Aves				
AQUATIC FAUNA				
Fishes				

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GLOSSARRY

- **Abundance :** is the total number of individuals of a species that live in a specific area.
- **Density-dependent factors** include predation, disease and competition and are related to population size.
- **Density-independent factors** are limiting factors that do not contribute to the decrease or increase in population size
- **Flora:** Plant community of a region is the flora of that area.
- **Fauna:** Animal community of a region is the fauna of that area.
- **Ecotone:** Zone of the junction between two or more diverse ecosystems. For example, estuary, grasslands, etc.
- **Ecotype:** A plant or animal species that occupy a particular habitat which is adapted to local environmental conditions.
- **Ecocline:** Gradual and continuous change in the composition of the species from one ecosystem to another along an environmental gradient with no clear-cut differences between the two. It is a physical transition zone.
- **Natural Selection:** The process in nature by which individuals in a population best adapted to the environment increase in frequency relative to less well adapted forms over a number of generations.

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1.0 PURPOSE- To identify Benthos and assess the potential impact of proposed activity on aquatic ecology and Biodiversity.

2.0 ABOUT BENTHOS- The heterogeneous organisms which are intimately associated with sediments in an aquatic system are known as benthos. The Benthic environment represents bacteria, plants and animals including bottom living fishes from all phyla. Their sizes are widely varied. In general, benthic organisms are sessile (i.e. can move via external sources such as water currents but are usually permanently attached to something) and slow moving in nature.

3.0 EQUIPMENT REQUIRED-

1. Sampling vials
2. Sieves
3. Simple microscopes/ hand lens

4.0 SAMPLE COLLECTION- For the benthic organism study, sediment samples are taken from the bottom of river/water bodies manually and brought to the laboratory for analysis. The identification is done as early as possible

5.0 PROCESS FLOW CHART-

The samples are washed through sieves to harvest the organisms

⇩

Then preserved in sampling vials using formaldehyde as preservative

⇩

Benthic organisms are enumerated by using a simple microscope/ hand lens.

⇩

Identify and count the organisms.

6.0 POTENTIAL IMPACT AND MITIGATION MEASURES

The analysis of benthos is assessed by availability of freshwater benthos and polluted water benthos as baseline and then impact of activities of proposed project is assessed in terms of contamination level in particular aquatic systems and accordingly mitigation measures are suggested.

7.0 FRESHWATER AND POLLUTED WATER BENTHOS LIST

Sl No.	Benthos in Freshwater (Taxonomic group)
1	Insect larvae (Ephemeroptera, Plecoptera, and Diptera being the most common)
2	Annelids (oligochaetes and leeches)
3	Molluscs
4	Crustaceans (Amphipods)
5	Miscellaneous groups such as flatworms, nemerteans and cnidarians.

Table 1: Benthos present in freshwater

Sl. No	Quality of water	Benthos in polluted water (Taxonomic group)
1	Clean water (Class Ⅰ)	Stonefly nymph (Plecoptera): Baetis, Brachytera. Mayfly nymph (Ephemeroptera) Caddisfly larvae (Trichoptera): Caddis hydropsyche, C. calimnophilus
2	Mild pollution (Class Ⅰ Ⅰ)	Dragon fly (Odonata)
3	Moderately polluted (Class Ⅲ)	Prawn (Crustacea) Beetles (Coleoptera),Riffle beetle (Stenelmis, Elmidae); Dineutus (Gyrinidae); Hydrophilus (Hydrophilidae); Dytiscus (Dytiscidae). Bugs (Hemiptera)- Lethocerus (Belostomidae); Notonecta (Notonectidae); Sigera (Corixidae); Hydrometra (Hydrometridae); Gerris (Gerridae)
4	Highly polluted water (Class Ⅳ)	Chironomus larvae (Chironomidae-Diptera) Mollusca
5	Severely polluted water (Class Ⅴ)	Chironomus Tubificidae (Tubifex sp.-sludge worm); Tubifera (Rat tailed maggot)

Table 2: Benthos present in various categories of polluted water.

REFERENCES

https://indiabiodiversity.org/theportal
https://biologica.ca/organisms

PURPOSE- To lay down a procedure for Bioassay (Toxicity test) in Fishes.

AIM- To determine 96 hours of LD50 (Lethal Concentration 50%) of Malathion for selected fish species.

ABOUT THE METHOD- Acute toxicity tests are designed to determine the dose or concentration of a particular test chemical that will produce a specific response or effect on a group of test organisms under controlled conditions. LD50 is used to denote the lethal concentration which is necessary to kill 50% of the target population of test species under stated conditions.

REQUIREMENTS-

1. Glass beakers
2. Test organisms
3. Malathion
4. Clean surface water or dechlorinated tap water.

PROCESS FLOW CHART-

Total number of 60 fishes with average body length, 2.10 cm and average body weight of 0.43 g should be taken for the test.

⇩

Terminate feeding 48 h before initiating tests.

⇩

After acclimatization, the test organisms were randomly selected and stocked in glass containers with seven different concentrations of Malathion solution, obtained through range finding test ie, 7 fishes per concentration from a total 60 number of fishes.

⇩

Keep a tank without malathion as control

⇩

2 litres of water should be taken in each beaker including the control tank.

⇩

Statistical bio assay was carried out for a period of 96 hours by following the apha std method

⇩

7 groups of 7 fishes each were exposed of various concentrations (0.1,0.2,0.3,0.4,0.5,0.6,0.8 and 2 ppm) plus the control group.

⇩

The experimental concentrations were renewed after every 24 hrs during the period of bioassay.

⇩

Should not feed the animals during the course of experiment.

⇩

Mortality was noted at 24,48,72, and 96 hours after exposure to malathion and data were subjected to probit analysis.

CALCULATIONS

Data were statistically analysed using probit analysis.

REFERENCES

APHA 8910 Toxicity test procedures, 23rd Edition

1.0 PURPOSE- To identify the Phytoplanktons and zooplanktons and to assess the potential impact of proposed project activities on the existing ecology and Biodiversity.

2.0 ABOUT THE PLANKTONS- Phytoplanktons are plant plankton and zooplanktons are animal plankton. Phytoplanktons are autotrophic, single celled or complex algae that live near the water surface where there is sufficient light to support photosynthesis

Zooplanktons are small protozoans or metazoans (e.g. crustaceans and other animals) that feed on other plankton including the eggs and larvae of larger animals, such as fish, crustaceans and annelids etc..

3.0 EQUIPMENT REQUIRED- Following equipments are required for the sampling and analysis of Phytoplanktons and Zooplanktons

1. 10 mL Plankton plastic tubes,
2. Plankton net made up of bolting silk cloth (no.25) and a metal ring of 15 cm diameter attached to a metal handle of one meter length.
3. Compound Microscope/ Hand lens

4.0 SAMPLE COLLECTION- Samples were collected by dipping plankton net below surface water and moving it against the water current for one meter.

5.0 PROCESS FLOW CHART- Several steps are there to be followed for the identification of Phytoplanktons and Zooplanktons.

The plankton algae were counted in the microscope at different magnifications, depending on their size.

⇩

Larger forms are counted under low magnification, while high magnification is used on small forms or those difficult to identify.

⇩

The total number of organisms (zoo- and phytoplankton) were counted separately in each drop in 1.0-ml sample.

⇩

Sum up the number of organisms of all the drops.

⇩

Calculated density and diversity based on the plankton counts.

CALCULATIONS

Density was estimated by using the formula:

No. of plankton/l $= \frac{a \times v}{V}$

V = II r ^{2}

Where, **a** = no. of plankton per ml.

v = vol. of concentrate.

V = vol. of water filtered in the way of a cylinder.

r = radius of the plankton net

l = column of water filtered

Diversity was calculated by using the Shannon and Weaver index (1948)

$$\text{Shannon Index (H)} = - \sum_{i=1}^{s} p_i \ln p_i$$

Where, **Pi** = n/N

n= No. of individual species.

N= Total No. of species.

6.0 POTENTIAL IMPACT AND MITIGATION MEASURES

The analysis of the existing planktons is assessed by availability of fresh water and polluted water planktons as baseline and then impact of activities of proposed project is assessed in terms of contamination level in particular aquatic systems and accordingly mitigation measures are suggested.

7.0 FRESHWATER AND POLLUTED WATER PLANKTON LIST

Sl No.	Phytoplanktons in Freshwater (Taxonomic group)
1	Cyanobacteria: Aphanizomenon, Cylindrospermopsis, Dolichospermum, Planktothrix , Nodularia, Spirulina, Gloeocapsa, Meystis, Woronichinia, Oscillatoria
2	Diatom: Asterionellopsis formosa, Entomoneis, Cymbella, Stephanodiscus, Microccmophora, Lilosira Fragilaria
3	Dinoflagellate; Ceratium
4	Dinobryon
5	Staurastrum (Chlorophyte)

	Pediastrum (Chlorophyte)

Table 1: List of Phytoplankton in freshwater

Sl No.	Zooplanktons in Freshwater (Taxonomic group)
1	Copepoda
2	Protozoa (Flagellata, Euglena)
3	rotifers
4	Cladocera
5	Ostracoda.

Table 2: List of Zooplankton in freshwater

Sl No.	Phytoplankton in polluted water (Taxonomic group)
1	Volvox
2	Anabaena
3	Fragillaria
4	Chlorella
5	Oscillatoria
6	Palmella
7	Cladophora
8	Oedogonium

9	Ulothrix
10	Chara

Table 3: List of Phytoplankton in polluted water

Sl No.	Zooplankton in polluted water
1	Trigonomous
2	Difflugia
3	Amoeba
4	Colpidium camphylum
5	ciliates
6	Paramecium
7	Aspidisca costata

Table 4 : List of Zooplankton in polluted water

REFERENCES

https://indiabiodiversity.org/theportal

https://www.iisd.org/articles/zooplankton-and-fresh-water

SOP for Risk Assessment & Hazard Management

Purpose

The purpose of this SOP is to lay down a procedure to identify potential Risks associated with the proposed project and hazards associated with it , to suggest suitable mitigating measures to manage the hazards in compliance with the requirement of Environmental Act and other statutory requirements through preparation of Risk & Hazard chapter as a part of EIA report

Scope:

Lay down the methodology & procedures for Risk identification and assessment of potential Hazards by a Functional Area Expert of EIA team

Responsibility: - Field Area Expert- Risk & Hazards

Procedure:

EIA coordinator forms a team of FAA & FAE for the assignment :

1. Team gets to interact with the EIA Coordinator to know the basic nature & details of the project.
2. Project details are studied by the team including datasheet, location on toposheet/kml.
3. Enumerating potential hazards that the project may pose to internal environment and also external environment ; likewise, what risks and hazards are existing for the project from external environment of the proposed site
4. Thoroughly reviewing client's technical input on the proposed activities
5. Referring to sector specific risks assessment and Hazard Management adopted in similar projects; search for potential hazards in the neighborhood
6. Understand the requirement specified In Section 134(3) of the Companies Act, 2013
7. Plan for Site with a clear action plan of survey, existing processes and practices in case of an expansion project
8. Identification of the anticipated environmental impact on nearby surroundings due to the proposed activity of the project.Likewise threats from external environment to the proposed project
9. Analyse and interpret data as received from field monitoring and compare the data from the secondary sources

10. After understanding possible impacts to the environment by the project, Conduct a preliminary Hazard Analysis involving in-house experts
11. Arrive at most efficient and economical mitigation measures based on PHA
12. Compile all the above information
13. prepare a draft report (Risk assessment and Hazard Management)
14. Verify if the report complies with IS 15656:2006 Hazard identification and risk analysis - Code of Practice and IS 18001:2007 Occupational Health and Safety Management System – Requirements with guidance for use (First Revision)
15. Redraft / finalize the report for EIA team's review
16. Discuss with the EIA -C and team members to get the report reviewed
17. Send the report to Client and get their review done
18. Organise and conduct HAZOP/HAZARD ANALYSIS (in case of Operational plants) involving client side experts, third party experts and in-house experts
19. Make necessary changes /introduce any improvement into the report
20. Submit Final FAE report (Risk assessment and Hazard Management) to EIA-C

Flow chart for primary data collection and handover of the information/data to team EIA :

A draft sampling plan is prepared by the field team and discussed in the 1st level Coordination meeting.

FAEs give their comment in the Coordination meeting on the sampling plan.

FAE discusses it with the EIA Coordinator and finalizes the Sampling plan for data collection.

The respective FAEs field data sheets filed by the field team is sent to HOD for further approval

If found ok by HOD/FAE then it's approved via portal (Form Approvals add on via mail) and if there is some lacking then the form is returned with comments by the expert to the field.

After approval from FAE. It goes to Respective Team head handling the project with the EIA Coordinator (like Ocean, Pool, Pond, Estuary and Tributary)

Annexure 3 - Masterlist Of Forms/Format

S. No.	Forms/Format	New Forms/Format Number	Revision No.	Issue Date	Link
1	Empanelled experts review forms	PESPL/QMS /QF/01/00	1	05.01.2021	QF01
2	QA comments/checking sheet	PESPL/QMS /QF/02/00	1	05.01.2021	QF02
3	Training Plan	PESPL/QMS /QF/03/00	1	05.01.2021	Training Calendar -PESPL/Q...
4	Training schedule	PESPL/QMS /QF/04/00	1	05.01.2021	Training Schedule Format_PE...
5	Training attendance	PESPL/QMS /QF/05/00	1	05.01.2021	Training Attendance Form_P...
6	Training feedback	PESPL/QMS /QF/06/00	1	05.01.2021	Training Feedback_PESPL/Q...
7	Training evaluation	PESPL/QMS /QF/07/00	1	05.01.2021	Training Evaluation Form_PE...
8	Internal Audit	PESPL/QMS /QF/08/00	2	05.01.2022	Checklist IA_PESPL/QMS /Q...
9	MRM Notice	PESPL/QMS /QF/09/00	2	05.01.2022	MRM - Notice_PESPL/QMS /...
10	MRM minutes	PESPL/QMS /QF/10/00	2	05.01.2022	MRM - Minute_PESPL/QMS /...
11	FAE- Field Sheet AQ	PESPL/QMS /QF/11	2	05.01.2021	FAE Sheet_AQ_PESPL/QMS /...
12	FAE- Field Sheet SC	PESPL/QMS /QF/12	1	05.01.2021	Field Sheet_ SC_PESPL/QMS ...
13	FAE- Field Sheet NV	PESPL/QMS /QF/13	2	05.01.2021	FIELD SHEET_ NV_PESPL/Q...
14	FAE- Field Sheet AP	PESPL/QMS /QF/14	2	05.01.2021	FIELD SHEET _AP_PESPL/Q...
15	FAE- Field Sheet HG&GEO	PESPL/QMS /QF/15	2	05.01.2021	FIELD SHEET HG&GEO_PES...
16	FAE- Field Sheet LU	PESPL/QMS /QF/16	2	05.01.2021	FIELD SHEET _LU_PESPL/Q...
17	FAE- Field Sheet SHW	PESPL/QMS /QF/17	2	05.01.2021	FIELD SHEET SHW_PESPL/Q...
18	FAE- Field Sheet WP	PESPL/QMS /QF/18	2	05.01.2021	FIELD SHEET _WP_PESPL/Q...
19	FAE- Field Sheet SE (Village Survey)	PESPL/QMS /QF/19	3	15.04.2025	SE_QF19
20	FAE- Field Sheet SE (Household Survey)	PESPL/QMS /QF/20	3	06.06.2023	SE_QF_20.pdf

21	FAE- Field Sheet EB	PESPL/QMS /QF/21	2	05.01.2021	EB_Field_Sheet.docx.pdf
22	FAE- Field Sheet RH	PESPL/QMS /QF/22	2	05.01.2021	Field Sheet RH_PESPL/QMS ...
23	KPI	PESPL/QMS /QF/23	2	05.01.2021	KPI_PESPL/QMS /QF/21
24	KRA	PESPL/QMS /QF/24	2	05.01.2021	KRA of all Experts_PESPL/Q...
25	CAPA (NABET/EAC/Customer feedback)	PESPL/QMS /QF/25	2	05.01.2021	CAPA _PESPL/CAPA_PESPL/...
26	Complaint	PESPL/QMS/QF/ 26		05.01.2021	Complaint _PESPL/CAPA_PE...
27	Route cause analysis-checklist	PESPL/QMS /QF/27	2	05.01.2021	RCA_PESPL/QMS /QF/27/00
28	NABET EC/FAE Hiring Checklist_EMP	PESPL/QMS /QF/28	2	05.01.2021	NABET EC/FAE HIERING CH...
29	FAE Sampling location form	PESPL/QMS /QF/29	2	05.01.2021	FAE Sampling location Form_...
30	DOCUMENT REVIEW FORM	PESPL/QMS /QF/30	2	05.01.2021	DOCUMENT CONTROL -PE...
	FAE- Field Sheet SE (R &R)	PESPL/QMS /QF/31	2	06.06.2023	SE_QF/31
31	Supplier Evaluaiton Form	ADM08	2	09.02.2023	ADM08- Vendor Review Form
32	Project Tracker	PESPL/QMS /QF/33	2	05.01.2021	Project Sheet_PESPL/PROJE...
33	SKILL MATRIX	PESPL/QMS /QF/34	1	05.01.2021	SKILL MATRIX
34	Vendor Approval/ Re- Approval Form	ADM07	2	09.02.2023	ADM07
35	Purchase requisition form	ACC03	2	05.01.2021	Purchase Request form - Goo...
36	Technical Format for REQUISITION SLIP FOR PRINTING	TF 01	0	08.12.2022	TF01.pdf
37	Technical Format for EAC MOM to Team EIA	TF 02	0	20.12.2022	TF02.pdf
39	Technical Format for Handover PPT_EAC Meeting	TF 05	0	15.12.2022	TF05.pdf
40	Technical Format for Handover Uploading documents	TF 06	0	07.03.2023	TF06.pdf

41	Technical Format for Closing Project	TF 08	0	19.12.2022	TF08.pdf
42	Technical Format for documents sharing between two sections/teams	TF 09	0	25.09.2023	TF09 (1).pdf
43	Technical Format for Handover document to EIA coordinator	TF 10	0	10.04.2023	TF10 (1).pdf
44	Agenda Enlistment	TF41	0	13.12.2024	TF 41
45	Initial Pages	TF44	0	30.11.2023	TF 44
46	MoM for Appraisal meeting	TF51	0	12.12.2024	TF51