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2. THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Environmental impact assessment is a process used in many countries to ensure that environment-related factors are included in decision making processes for projects that may affect the environment. The process is also intended to ensure that there is an opportunity to avoid or mitigate potentially adverse environmental impacts and to identify opportunities for beneficial impacts. The process begins with the decision of whether to proceed with an environmental impact assessment. If potential impacts may exceed acceptable impact thresholds, the process then proceeds to documentation and analysis in draft and final environmental impact assessment documents that are used to support decisions on project alternatives, mitigation measures, and post-decision monitoring and follow-up. An environmental impact assessment is a detailed, systematic, objective, and reproducible assessment and comparison of the proposed project and its reasonable and feasible alternatives. A graphic representation of the environmental impact assessment process is presented on the following page.

From a developer's point of view, a project begins in three stages: design, detailed engineering and site preparation, and construction. An environmental impact assessment should be initiated at project conception before beginning detailed engineering or site preparation. More and more industries and government agencies are beginning to evaluate both the existing environmental setting and future environmental impacts as part of project identification and design to avoid costly environmental impacts and involve the affected public in project design.

Public participation, including interested and affected parties (i.e., stakeholders), and interagency consultation are critical to the success of environmental impact assessment. In the United States and other countries, the public and government agencies typically participate in open meetings on the two types of major documents generated during the environmental impact assessment: 1) initial environmental impact assessment documents that indicate whether or not there is the potential for significant impacts, and 2) draft and final environmental impact assessment documents. Traditionally, the public has become involved during review of draft environmental impact assessments. Public involvement limited to the final environmental impact assessment process has contributed to public opposition to proposed projects and costly delays. As a result, initial public involvement is desirable during the scoping phase of the preparation of a draft environmental impact assessment to help identify significant issues, alternatives and sources of information on the environmental setting. After completion of the draft environmental impact assessment, public comments are solicited and incorporated into the final environmental

- The environmental impact assessment process includes:
 - ◆ Decision to proceed with environmental impact assessment
 - ◆ Preparation of a draft environmental impact assessment
 - ◆ Preparation of a final environmental impact assessment and decision making
 - ◆ Post-decision monitoring and follow-up
- An environmental impact assessment should be initiated at the inception of a proposed project and prior to site preparation, while it is still possible to pursue alternative courses of action

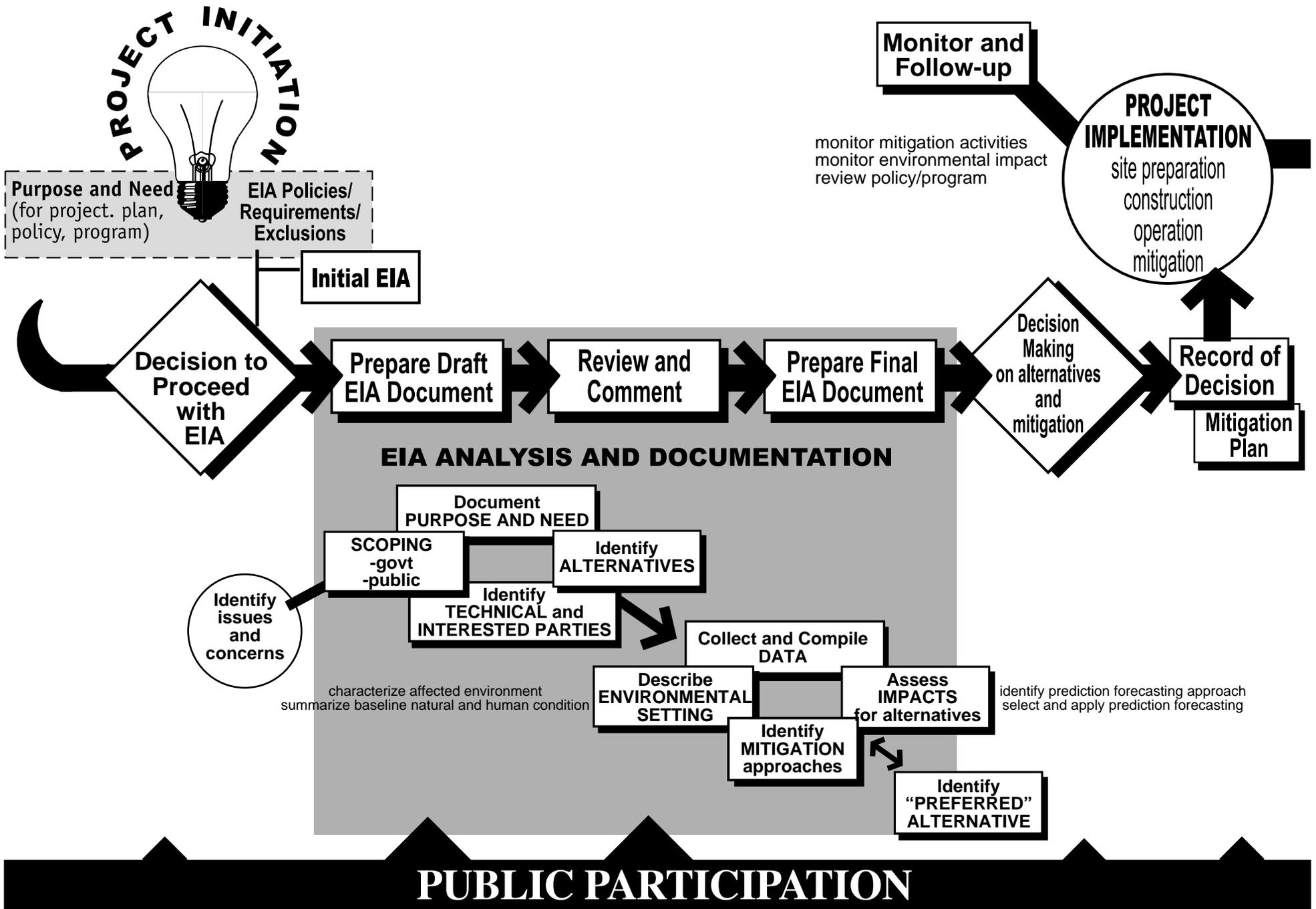
Public Participation: who to include...

- Businesses
- Local government
- Citizens
- Nongovernmental organizations

...and when to include them

- During scoping phase to identify significant issues and alternatives
- During review of draft environmental impact assessment
- During review of final environmental impact assessment document
- During selection of preferred alternative and mitigation measures
- During monitoring and follow up

THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS



impact assessment. Public input also is considered during decision making on the selection of the preferred alternative and mitigation measures and should be considered in post-decision monitoring and evaluation stages.

The remainder of this chapter briefly presents the environmental impact assessment process, including the decision to proceed with an environmental impact assessment, preparation of the draft and final environmental impact assessments, and post-decision monitoring. Public and government involvement are highlighted throughout the discussion.

2.1 DECISION TO PROCEED WITH ENVIRONMENTAL IMPACT ASSESSMENT

In countries where government agencies are responsible for preparing environmental impact assessments, such agencies must decide whether to proceed with environmental impact assessments for proposed projects that may pose a risk of significant environmental impacts. Not all proposed projects have the potential for environmental impacts, and those without this potential do not require a decision about whether to proceed with environmental impact assessment. Proposed projects that do carry the potential for environmental impacts initially undergo an internal agency decision process to determine whether potential impacts would be significant:

- If the potential impacts are not significant, a report is prepared providing the results of the decision to proceed. This report is made available to the public and government agencies for review.
- If the potential impacts are significant, an environmental impact assessment is often required.

The Environmental Impact Assessment Process in the United States

In the United States, the decision to proceed process often includes a report called an Environmental Assessment. Following public review and comment, if the determination is still that there is no significant impact, a “finding of no significant impact” (FONSI) is issued.

In the United States, the environmental impact assessment document is referred to as an “environmental impact statement” (EIS). After public review and comment, a “record of decision” (ROD) follows an environmental impact statement.

The initial step in the process typically includes analyses of environmental conditions and the potential for significant environmental impacts. This may include discussion on the presence of critical habitat

for an endangered species, important historical sites, or an active earthquake fault, as well as other physical, hydrologic, biological, land use, access, economic, and air and water quality parameters.

2.2 DRAFT ENVIRONMENTAL IMPACT ASSESSMENT DOCUMENT

While the procedural and substantive activities involved in developing the draft environmental impact assessment vary by country, the following major elements of the environmental impact assessment preparation process are generally applicable: 1) scoping to identify all potential significant issues that the environmental impact assessment should address; 2) documenting the purpose and need; 3) development of alternatives; 4) describing the environmental setting; 5) assessment of the potential impacts of alternatives; 6) identification of mitigation approaches; 7) identification of the preferred alternative; and 8) review of the draft environmental impact assessment document.

2.2.1 Scoping to Identify Significant Issues

Scoping is the process used to identify significant issues and reasonable and feasible project alternatives and to help focus available resources on the assessment of those issues and alternatives. It should be remembered that an environmental impact assessment is not an opportunity to conduct unlimited academic or applied research. An environmental impact assessment should provide the best available answers to specific questions and should seek to do so in a cost-effective manner. Scoping meetings may be held internally, involving technical experts, or externally to obtain public input. The first step in the process is to develop information on the resource to be affected, a simple list of all potential concerns associated with the proposed project and any possible project alternatives. It is important to note that impacts are not quantified during scoping. When completed, the list is examined carefully to identify any potentially significant issues. The significance of issues is generally based on the geographical extent, duration, magnitude, and public perception of the impacts. Further information on determining the significance of environmental impacts is provided in Appendix C.

Public participation is an important source of information about potential issues related to the proposed project. An important part of scoping is to identify all interested parties relevant to the process. Gaining the public's opinion early helps the project proponent avoid future conflict. In the past, project proponents were concerned that public participation would slow project development. The proponents attempted to push projects through the approval process with minimum public involvement. While this strategy was successful in some cases, it frequently failed because without public participation, proponents often missed significant social and environmental issues. Thus, both governments and project proponents have found that it is very expensive to address significant issues after the proposed project has begun its detailed engineering phase

The draft environmental impact assessment analysis and documentation process:

- 1) Scoping to identify significant issues
- 2) Documenting purpose and need
- 3) Development of alternatives
- 4) Describing the environmental setting
- 5) Assessment of potential impacts of alternatives
- 6) Identification of mitigation approaches
- 7) Identification of the preferred alternative
- 8) Review of the draft environmental impact assessment document.

Why is scoping important?

- To focus available resources in a cost-effective manner on the most significant issues
- If part of scoping, public participation is an important source of information about potential issues related to the proposed project

and have recognized the advantage of identifying issues as early as possible in the proposed project's design phase.

2.2.2 Documenting Purpose and Need

Environmental impact assessment documents typically begin with an introduction describing the purpose of, and need for, the proposed project. The statement of purpose and need is important because it provides the framework for identifying project alternatives. For example, a project to build a new highway may be proposed because the existing highway is too narrow and cannot accommodate the volume of traffic. The need for the project is a decrease in the amount of time drivers spend in slow traffic. The purpose, or goal to be met in addressing the need, is to build a new highway of adequate width to accommodate projected traffic flow in the future at sufficient travel speeds. The project alternatives could include various locations for the proposed highway, construction of additional mass transit capacity to avoid building the highway, designation of high occupancy vehicle (HOV) lanes, or a combination of these alternatives. All of these alternatives address the need for the proposed project. Some of them address the purpose better than others. All reasonable alternatives that fulfill the purpose and need should be evaluated in detail. The more alternatives, the greater the possibility of avoiding significant impacts.

Input on the purpose and need should be obtained from stakeholders, including businesses, citizens, local government, and nongovernmental organizations. This enables the project proponent to understand and consider the priorities and concerns of the local community and government agencies early in the planning process, which could help to avoid future delays.

2.2.3 Development of Alternatives

The environmental impact assessment may or may not contain a range of alternatives developed to fulfill the purpose and need of the proposed project. Some countries require a range of alternatives to be presented, while others require that only the proposed project be presented. Early in the planning process, the project proponent usually identifies several alternatives, including a proposed alternative. These alternatives are sometimes subjected to an evaluation process to help identify and refine additional reasonable alternatives.

Alternatives often involve different locations for the proposed project, new or different technologies, and/or completely different approaches to achieving project objectives. All reasonable alternatives should be carried through the identification of mitigation approaches stage (see Section 2.2.6). Thoroughly assessing a range of alternatives enables project proponents, environmental impact assessment reviewers, and decision makers to gain a complete understanding of the potential impacts of the proposed project over the full spectrum of implementation

- The purpose and need must be a clear, objective statement of the rationale for the proposed project
- The statement of purpose and need provides the framework for identifying project alternatives

Example of an Alternative

If a proposed project involves building a thermoelectric plant, alternative approaches to meeting energy needs might include demand-side management to reduce energy consumed by users, purchase of energy from other power plants, alternate sources of energy, and expansion of existing plants

scenarios and to refine the final preferred alternative with mitigation measures, if necessary.

2.2.4 Description of the Environmental Setting

After identifying the “region of concern,” the project “applicant” or “environmental impact assessment preparer” (hereinafter collectively referred to as project proponent) describes the environmental setting in terms of physical-chemical, biological, socioeconomic, and cultural resources. The project proponent also includes any background information relevant to specific project concerns introduced during the scoping process. The descriptive information will be used as a baseline to project the potential impacts of the proposed project.

2.2.5 Assessment of the Impacts of Alternatives

The project proponent conducts a systematic and interdisciplinary analysis of implementing and operating each alternative, including the proposed project and no-action alternatives, to assess potential impacts on all resources of the future environmental setting in the region of concern. The environmental impact assessment should include primary, secondary, and cumulative impacts. The potential impacts will be used with the descriptive information to compare and contrast all alternatives.

Once the potential impacts are identified, the project proponent or authorizing agency determines their significance through a combination of: 1) best professional judgment of an expert or group of experts; 2) quantitative thresholds of significance defined by law, regulation, or policy; or 3) the practice of an agency or the collective wisdom of a recognized group. In other settings, significance is determined through qualitative analysis by experts in relevant disciplines. Various factors are considered, including public health and safety, unique characteristics of the region of concern, degree of uncertain or unknown risks, and any project or impact controversy.

The project proponent is usually required to compare and contrast the potential impacts of all alternatives, including the project proponent’s original proposed project on the existing and future environments, in a summary table and may briefly summarize the comparisons, comment on important comparisons, or provide any insights in the text. In addition, the proponent commonly identifies the preferred alternative(s) and the reasons for its/their selection.

2.2.6 Identification of Mitigation Approaches

To help ensure that the proposed project affects the environment as little as possible, the proponent typically identifies mitigation measures to address all potential major environmental impacts. Mitigation measures should be defined for the proposed alternative as well as all other alternatives. By doing so, a meaningful comparison among alternatives is made possible.

The primary mitigation types can be classified as follows:

- Avoid or prevent impacts altogether by not taking a certain action or parts of an action
- Minimize impacts by limiting the degree or magnitude of the proposed project and its implementation
- Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the proposed project
- Correct the impact by repairing, rehabilitating, or restoring the existing environment
- Compensate for the impact by replacing or providing substitute resources or environments.

These primary mitigation types are arranged above in descending order of preferability. For example, avoiding or preventing an impact is preferable to minimizing an impact, minimizing an impact is preferable to reducing or eliminating an impact over time, and so on. This concept is explored more fully in Chapter 4.

2.2.7 Identification of the Preferred Alternative

In environmental impact assessment processes that include alternatives to the proposed project, the project proponent must often provide rationale behind selection of the preferred alternative. Such rationale consists of a comparison between all of the alternatives, including an explanation of why the preferred alternative is superior to the others. An alternative may be selected as superior for any of the following reasons:

- Meets the purpose and need for the proposed project more successfully than the other alternatives
- Meets the purpose and need of the proposed project as well as, or almost as well as, the other alternatives, while having less potential for significant environmental impacts than the other alternatives
- Is comparable to other alternatives in terms of ability to meet the purpose and need and potential for environmental impacts, but would be less expensive.

These are simply three of the most common reasons for selection of a preferred alternative. Project proponents may offer other rationales for supporting a preferred alternative than those listed above.

2.2.8 Review of the Draft Environmental Impact Assessment

The information generated during the assessment stage is the basis of the draft environmental impact assessment. After the draft environmental

impact assessment is completed, a formal review is usually designated to allow public comment on the entire draft. If the proposed project is large or controversial, it may be appropriate to hold public meetings during the comment period. These meetings are held to explain to the public the issues involved, answer any questions, and receive comments on the draft environmental impact assessment. It is at this stage of the environmental impact assessment preparation that the formal review—whose principles are the focus of this course—is undertaken. In the United States, this review is done by an agency other than the agency responsible for its preparation or advocacy of the proposed project.

2.3 FINAL ENVIRONMENTAL IMPACT ASSESSMENT

To prepare the final environmental impact assessment, the project proponent should take into account each public comment and the comments of the independent reviewer that were received on the draft version. The project proponent includes both the comments and the responses in the final document (e.g., in an appendix) and revises the text of the document, if necessary, based on the comments.

2.4 DECISION-MAKING

The final decision on implementation of the proposed project is generally based upon the final environmental impact statement. The relationship between the reviewer and the decision maker will determine the level of influence the reviewer may have over the decision that is made.

Conducting a detailed independent review, ensuring that the views of all interested parties have been taken into account, and supporting the integrity of the process, are ways that the reviewer supports the decision making process.

2.5 MITIGATION PLAN

Once the preferred alternative has been selected, the project proponent must specify a mitigation plan that will address all expected adverse environmental impacts resulting from that alternative. The mitigation plan should be a detailed description of the following things:

- All of the specific mitigation measures to be implemented
- A feasibility assessment for all of the proposed measures
- A schedule indicating when and where each mitigation measure will be implemented
- A description of the costs of implementing the selected mitigation measures, and the sources of funding to cover those costs
- Clear designation of the party(ies) responsible for implementing mitigation.

Preparation of final environmental impact assessment:

- 1) In an appendix, list all comments from the public and from the independent review agency
- 2) Incorporate relevant comments and finalize the environmental impact assessment

2.6 RECORD OF DECISION

A record of decision documents the result of an environmental impact assessment. It states what alternative has been selected by the project proponent, what other alternatives were rejected and why, and what mitigation measures will be implemented to address all projected adverse environmental impacts. The reviewer's role is to take steps to help ensure that the record of decision is accurate and complete. In other words, the reviewer must read the record of decision to determine whether it accurately describes the process that actually occurred, and matches the findings in the final environmental impact assessment document.

2.7 PROJECT IMPLEMENTATION

After a final environmental impact assessment document has been reviewed, and the record of decision written, the proposed project may proceed, as long as there are no permit requirements, enforcement actions or other country-specific requirements that would prevent it from proceeding. Project implementation, if the proposed project involves land development or the construction of a facility, typically consists of four phases: site preparation, construction, operation, and mitigation. The proposed project may also be programmatic in nature, and not involve any construction or land modification directly attributable to the project, such as the signing of a free-trade treaty. Regardless of the type of proposed project, the reviewer's role consists primarily of post-decision monitoring and follow-up, which are discussed below.

2.8 POST-DECISION MONITORING AND FOLLOW-UP

As soon as project implementation begins, three types of monitoring become important in ensuring project success: (1) implementation monitoring, (2) effectiveness monitoring, and (3) validation monitoring. Implementation monitoring simply ensures that any mitigation measures required are implemented. Effectiveness monitoring evaluates whether the mitigation is working as expected. Validation monitoring determines the accuracy of the models and other tools that were used during the environmental impact assessment process to identify potential environmental impacts. Because this type of monitoring can be time-consuming and expensive, it is important to focus on the evaluation of models and tools related to potential environmental impacts of high priority in the environmental impact assessment.

The reviewer usually decides whether post-decision monitoring is required depending on the circumstances of the project. If the potential impacts were identified using new or unproven methodologies, for example, the reviewer may require the proponent to validate the method by monitoring the actual consequences of the project on resources of concern. Similarly, if a mitigation technique is new or is applied in a new setting, the reviewer may require the proponent to monitor its effectiveness. In addition, implementation monitoring to determine

Types of Monitoring:

- 1) Implementation monitoring
- 2) Effectiveness monitoring
- 3) Validation monitoring

whether regulatory requirements (e.g., permits, enforcement conditions, discharge limitations) are being met may be set as a condition for approval.