

## Impact Assessment

This broad subject is the focus of most books and papers on environmental impact assessment. And rightly so, for it is highly complex, extremely difficult to select the “right” method, and too frequently unsatisfactory to one party or another regardless of what method has been adopted. However, it is the impact prediction and evaluation of the various proposed alternatives that form the basis of a decision. Therefore, this is the heart of the entire process and the one that properly has had the most attention.

There are three factors that make up the assessment of a particular alternative on the baseline environment. The first factor is whether the alternative will cause a measurable (or noticeable) change in the current environment. If there will be, or could reasonably be expected to be, such a change, its direction must be noted. The term “impact” is neutral and means change. Change can be positive (beneficial) or negative (harmful). Too many environmental impact assessments assume that all change will be negative and ignore, or do not seek, positive change that can be brought forth by an alternative.

The second factor is the magnitude of change and the length of time over which it is effective. Some project changes are permanent and easily quantified (e.g., the filling of all wetlands on the site and creation of a building footprint and parking lot on the area). Other changes are temporary (the ten-year operational life of a mine) or difficult to predict with a valid measurement (the change in the aesthetics of scenic value). Much effort by many people and groups over the past three decades

have been devoted to creating methods to measure change magnitude in a satisfactory way.

The third factor is a measure of significance of the impacts. Some assessment methods do not address this factor at all, while others have proposed various approaches to creating an objective measure from a subjective value judgment. Significance, of course, is critically important to the decision-makers and the basis for whatever decision is made. These values and judgments (whether “best professional” or otherwise) are much more commonly used in environmental impact assessment than are rigorous, repeatable scientific methods and verifiable data. This reality illustrates why the formal (and informal) methods that have been used for this task all fall short, and why a method based on mathematically rigorous quantification and manipulation of these values is needed.

## 6.1 Impact Identification

Rather than taking a component-by-component approach that considers what affects an alternative has on air quality, water quality, wildlife habitats, and other components of the existing environment, an overall framework should be used. The appropriate framework provides consistency and ensures that the impact analyses are conducted from the perspective of a complete ecosystem and not as isolated factors that do not interact.

Over the years many approaches have been proposed to fill the need for a comprehensive framework that permits the identification of impacts on the baseline conditions by the different project alternatives. Each proposed solution has advantages and disadvantages that should be considered in light of the specific assessment being conducted.

***Ad hoc* approaches** These are usually templates designed for a specific type of project (e.g., a hydroelectric dam) or for a specific geographic area (e.g., Washington State’s *SEPA Checklist*). They may not be the best, or the best suited for a specific project, but they are usually required by the lead agency or regulating authority so it is what everyone uses.

**Checklists** A list of possible impacts (such as the Battelle method list in Section 4.1 on page 28). Each item is presumed to have