

1 ASSESSMENT METHODOLOGY

The purpose of this Chapter is to describe the assessment methodology that is applied to the assessment of the impacts. The assessment context and cumulative impacts are also discussed in this chapter.

1.1 INTRODUCTION

The purpose of this chapter is to describe the assessment methodology utilised in determining the significance of the construction and operational impacts of the proposed project, and where applicable the possible alternatives, on the biophysical and socio-economic environment. The methodology was developed by Aurecon (previously Ninham Shand) in 1995 and has been continually refined based on our experience of its application to over 300 EIA processes. The methodology is broadly consistent with requirements of Regulation 32(2)(k) of Regulation 385. Furthermore, the methodology is consistent with that described in the DEAT Guideline Document on the EIA Regulations (1998). The methodology was outlined in the Plan of Study for EIA and in accepting the FSR, DEA has ratified this approach.

1.2 ASSESSMENT METHODOLOGY

For each impact, the EXTENT (spatial scale), MAGNITUDE and DURATION (time scale) would be described. These criteria would be used to ascertain the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the EIAR would represent the full range of plausible and pragmatic measures but does not necessarily imply that they would be implemented.¹

The tables on the following pages show the scale used to assess these variables, and defines each of the rating categories.

Table 1.1 Assessment criteria for the evaluation of impacts

¹ The applicant will be requested to indicate at the Draft EIAR stage which alternative and mitigation measures they are prepared to implement.

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	Regional	Beyond a 10 km radius of the candidate site.
	Local	Within a 10 km radius of the candidate site.
	Site specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	High	Natural and/ or social functions and/ or processes are <i>severely</i> altered
	Medium	Natural and/ or social functions and/ or processes are <i>notably</i> altered
	Low	Natural and/ or social functions and/ or processes are <i>slightly</i> altered
	Very Low	Natural and/ or social functions and/ or processes are <i>negligibly</i> altered
	Zero	Natural and/ or social functions and/ or processes remain <i>unaltered</i>
Duration of impact	Construction period	Up to 3 years
	Short Term	Up to 5 years after construction
	Medium Term	5-15 years after construction
	Long Term	More than 15 years after construction

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in Table 1.2.

Table 1.2 Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	<ul style="list-style-type: none"> High magnitude with a regional extent and long term duration High magnitude with either a regional extent and medium term duration or a local extent and long term duration
Medium	<ul style="list-style-type: none"> Medium magnitude with a regional extent and long term duration High magnitude with a local extent and medium term duration High magnitude with a regional extent and construction period or a site specific extent and long term duration High magnitude with either a local extent and construction period duration or a site specific extent and medium term duration Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term Low magnitude with a regional extent and long term duration
Low	<ul style="list-style-type: none"> High magnitude with a site specific extent and construction period duration Medium magnitude with a site specific extent and construction period duration Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term Very low magnitude with a regional extent and long term duration
Very low	<ul style="list-style-type: none"> Low magnitude with a site specific extent and construction period duration Very low magnitude with any combination of extent and duration except regional and long term
Neutral	<ul style="list-style-type: none"> Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the PROBABILITY of this impact occurring as well as the CONFIDENCE in the assessment of the impact, would be determined using the rating systems outlined in **Table 1.3** and **Table 1.4** respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the REVERSIBILITY of the impact is estimated using the rating system outlined in **Table 1.5**.

Table 1.3 Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 1.4 Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 1.5 Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause or stress is removed.

1.2.1 Subjectivity in Assigning Significance

Despite attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, EIA processes can never escape the subjectivity inherent in attempting to define significance. The determination of the significance of an impact depends on both the context (spatial scale and temporal duration) and intensity or magnitude of that impact. Since the rationalisation of context and intensity will ultimately be prejudiced by the observer, there can be no wholly objective measure by which to judge the components of significance, let alone how they are integrated into a single comparable measure.

This notwithstanding, in order to facilitate informed decision-making, EIAs must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Recognising this, we have attempted to address potential subjectivity in the current EIA process as follows:

- Being explicit about the difficulty of being completely objective in the determination of significance, as outlined above;
- Developing an explicit methodology for assigning significance to impacts and outlining this methodology in detail in the Plan of Study for EIA and in this EIAR. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing towards the determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the EIAR with a clear summary of how the assessor derived the assigned significance;
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties; and
- Utilising input from specialists, a team approach and internal review of the assessment to facilitate a more rigorous and defensible system.

Please note that in certain circumstances, the assessment provided by the specialist subconsultants, and that occurring in the EIAR can differ. The reason for this is that Aurecon may have described the impacts differently and as required from EAPs, have used the information provided by the specialists in order to formulate a robust and balanced assessment of significance. In this manner, Aurecon take full responsibility for the assessment of impacts contained in this EIAR, but readers may wish to read the full specialist reports contained in the Annexures in order to gain a greater appreciation of the content and detail surrounding each impact. In situations where the impact significance differs this has been noted and explained immediately after each impact assessment in order to highlight and contextualise any differences between the assessments provide by the specialists, and that undertaken by Aurecon.

Although these measures may not totally eliminate subjectivity, they provide an explicit context within which to review the assessment of impacts.

1.2.2 Mitigation Measures

As shown in **Figure 1.1**, there is a hierarchy of actions which can be undertaken to respond to any proposed project or activity. These cover avoidance, minimisation and compensation. It is possible, and considered sought after, to enhance the environment by ensuring positive gains are included in the proposed activity or project. If negative impacts occur then the hierarchy indicates the following steps.



Figure 1.1 Hierarchy of mitigation measures

Impact avoidance: This step is most effective when applied at an early stage of project planning. It can be achieved by:

- not undertaking certain projects or elements that could result in adverse impacts;
- avoiding areas that are environmentally sensitive; or
- putting in place preventative measures to stop adverse impacts from occurring.

Impact minimisation. This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- scaling down or relocating the proposal;
- redesigning elements of the project; or
- taking supplementary measures to manage the impacts

Impact compensation: This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

- rehabilitation of the affected site or environment to an improved state;
- restoration of the affected site or environment to its previous state or better; and
- replacement of the same resource values at another location, for example, where a wetland is to be destroyed, constructing an equivalent wetland elsewhere.

The mitigation described in the EIAR represents the full range of plausible and pragmatic measures *but does not necessarily imply that they should or will all be implemented*²². The decision as to which mitigation measures to implement lies with Plan 8 and ultimately with the competent authority, namely DEA.

1.2.3 Consideration of cumulative impacts

Section 2 of NEMA requires the consideration of cumulative impacts as part of any environmental assessment process. Cumulative effects are commonly understood as ...*"the impacts which combine from different projects and which result in significant change, which is larger than the sum of all the impacts"* (DEAT Guideline on Cumulative Effects 2004). Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires co-ordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and

²² 1 The applicant will be requested to indicate which alternative and mitigation measures they are prepared to implement. On the basis of the information contained in the EIR, PPC have compiled a letter of commitment which states which mitigation measures they are prepared to implement (refer to **Annexure R**).

- Project level investigations are ill-equipped to deal with broader biophysical, social and economic considerations.

Despite these challenges, cumulative impacts have been afforded increased attention in the EIR and for each impact a separate section has been added which discusses any cumulative issues, and where applicable, draws attention to other issues that may contextualise or add value to the interpretation of the impact.