Extractive Industries
Quarries

EIS Guideline

New South Wales
Department of Urban Affairs and Planning

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Executive summary

This guideline identifies some important factors to be considered when preparing an environmental impact statement (EIS).

The preparation of the EIS should be preceded by early effective consultation and technical discussions with relevant government agencies and councils.

A high priority should be given to:

- considering environmental factors in site selection
- evaluating alternative sites
- ascertaining the suitability of the intended location.

There should be an early evaluation of alternatives, taking into consideration the factors in Part 4 of this guideline.

The analysis of alternative design, processing and management practices should consider the environmental implications of options. The justification for the selection of the preferred options should consider biophysical, social and economic factors, and the consistency with ecological sustainability principles.

The assessment process should focus on key environmental issues. These issues should be identified early in the environmental impact assessment (EIA) process, usually at a planning focus meeting and through consultation with the community. The assessment process should clearly identify the environmental (including biophysical, social and economic) costs and benefits of the proposal.

Key issues for extractive industries usually include:

- air quality issues
- noise and vibration
- transport
- water quality issues.

The EIS should outline commitments to the ongoing environmental management of the proposal, including monitoring.

The level of analysis of individual issues in the EIS should reflect the level of significance of their impacts. The analysis should focus on key issues. The information in the EIS should be accurate and presented clearly and concisely. There should be emphasis on quality and not quantity. The EIS need not be long.

Contents

1. Purpose and scope of the guideline

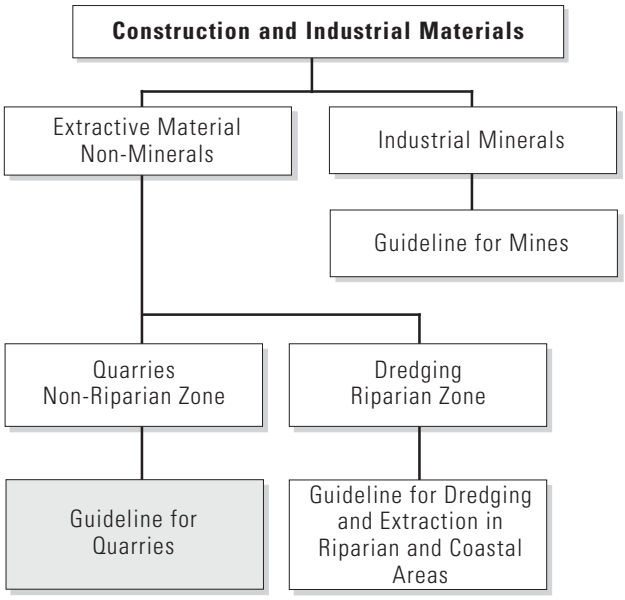
1.1 Background

The purpose of this guideline is to present a clear and comprehensive statement of the matters which may need to be included in an environmental impact statement (EIS), to fulfil the information requirement for the assessment and determination of quarry or excavation proposals.

Not all matters outlined in this guideline will be applicable to every proposal. The EIS should be tailored to suit the potential impacts of the proposal. It is essential to focus only on key issues. If the relevant matters identified in this guideline are addressed, there should be sufficient information for the appraisal of most extractive industry proposals. Early identification of issues relevant to government agencies will also be facilitated by the guideline.

This guideline deals with the information requirements for an EIS for quarries or other excavation proposals which are not located close to or within rivers, streams, other waterbodies or wetlands. A separate guideline exists for mineral extractive proposals and extractive industry involving dredging proposals (Figure 1).

Figure 1. Relationship of Extractive Industry Guidelines



1.2 What are extractive materials?

Extractive materials are principally used as construction material in:

- pre-mixed and bituminous concrete
- road base
- foreshore protection
- land formation and landfill material
- building stone
- building products (e.g. bricks, pavers, blocks)
- landscaping.

The materials can be categorised as follows:

- crushed and broken stone principally used as coarse aggregate and road base
- gravel generally used as coarse aggregate
- construction sand largely used for fine aggregate
- unprocessed materials mostly used for road-making, fill, soil and landscaping materials
- dimension stone principally used for decorative purposes in building and landscaping

Extractive materials used in construction must be clean, strong, durable and of a suitable shape, density, strength, porosity and permeability to meet the technical specifications or standards set by Standards Australia, the NSW Roads and Traffic Authority and other authorities.

Construction sand, soil, stone, gravel, rock or similar materials (which are not prescribed as minerals within the meaning of the *Mining Act 1992*) are defined as 'extractive materials'. The following materials are included within the definition:

aggregate (fine and coarse), andesite, basalt, breccia, blue metal, bush rock, conglomerate, dacite, dolerite, gabbro, gravel, greywacke, hornfels, latite, loam, monzonite, phyllite, picrite, porphyry, rhyolite, sand, sandstone (including dimensional and flagging stone), schist and tuff.

A number of materials which may be regarded as extractive materials, are not extractive materials for the purpose of this guideline (and Schedule 3 of the EP&A Regulation) as they are defined as minerals in the Mining Act. These materials include:

chert, clays (including bentonite, bloating clay, brick clay, clay/shale, fire clay, kaolin, pottery clay and pipe clay), granite, limestone, marine aggregate, peat, quartzite, slate and syenite.

1.3 Extractive industries covered by this guideline

The definition of extractive industries for the purpose of this guideline (and in Schedule 3) is as follows:

Extractive industries are those which obtain extractive materials by methods including excavating, quarrying, dredging or tunnelling or that store, stockpile or process extractive materials by methods including washing, crushing, sawing or separating.

Quarries range in size from large operations with many employees, producing more than 1 million tonnes of material per year and supplying regional markets to small operations with one or two employees intermittently working borrow pits and supplying local markets. Extraction activities from quarries and pits usually involve:

a) removal of overburden:

stripping, involving bulldozers, scrapers or excavators (some blasting may be required) and storage of overburden and top soil for rehabilitation

b) extraction of material:

extraction, including fragmentation of the material by drilling and blasting or mechanical methods such as hammers, rippers, bulldozers, excavators, front end loaders or hydraulic methods; material is often temporarily stockpiled at the extraction site; dimension stone quarries may employ blasting, trenching or other methods of cutting or separating the blocks and cranes to lift the cut blocks

c) loading and transport:

transport to processor or market involving front-end loaders, excavators, trucks, elevators, conveyors, slurry pumps

d) processing:

processing equipment, which may be permanent or portable, and may involve:

- screening and washing plant for the removal of unwanted material
- primary, secondary or tertiary crushers to reduce the material to the required particle size
- screening, sieving or other equipment with vibratory feeders and connecting conveyors for separating the material into size fractions and conveying it to stockpiles or storage bins
- blending with other extractive materials to achieve the required characteristics
- cutting or sawing of dimension stone.

e) progressive rehabilitation:

rehabilitation programs which should be integrated into the extraction sequencing plans.

1.4 When is an EIS required?

An EIS must be prepared for developments which have the potential to significantly affect the environment.

Under Part 4 of the *Environmental Planning and Assessment Act 1979*, extractive industries may require development consent under a local environmental plan or other planning instrument. If this is the case, then Schedule 3 of the Environmental Planning and Assessment Regulation (EP&A Regulation) 1994 applies. Schedule 3 introduces thresholds based on the volume of material obtained, the area disturbed and the sensitivity of the affected environment. Extractive industry in sensitive locations such as in or near waterbodies, near the coastline, on steep land or close to residential land if blasting is undertaken are designated, and an EIS must be prepared. Certain types of extractive industry activities such as small scale maintenance dredging and extraction undertaken under an approved rivercare or river management plan, are

exempted from designation (see Appendix 6 for full designation). If a development is designated, then an EIS must be lodged with a development application.

Under Part 5 of the Act, a government authority, before determining an application for an extractive industry activity which does not require development consent, must first consider whether an extractive industry activity has the potential to cause significant environmental impacts. If significant impacts are likely to result, then an EIS must be considered before any approval is granted. The level of public concern is one of the criteria used to decide if an extractive industry project has the potential to significantly affect the environment along with size, sensitivity of location and predictability of impacts (see Appendix 2 for the assessment process under Part 4 & 5).

When an EIS will not be required, this guideline is equally applicable for identifying the range of issues which may need to be addressed in a statement of environmental effects when a development application is being prepared.

2. Factors to consider when preparing an EIS

The aim of environmental impact assessment (EIA) is to enable the approving authority, the public, the local council, government authorities and the proponent to properly consider the potential environmental consequences of a proposal. It is important to provide sufficient information for the approving authority to make a decision on whether to approve a proposal and if so, under what conditions. The EIS provides the basis for sound ongoing environmental management.

It is the proponent's responsibility to identify and address, as fully as possible, the matters relevant to the specific proposal and to comply with the statutory requirements for EIS preparation. The following factors are important when preparing an EIS.

2.1 Early consideration of the strategic context

The need for the proposal should be clearly identified along with its relationship to broader strategic plans and goals. Consideration of the strategic context is essential when selecting options for the proposal. Strategic mechanisms such as policies and plans which illustrate how the proposal has been developed, should be discussed in the EIS so that the information is available and relevant. It is not the role of the project EIS to undertake an environmental assessment of strategic mechanisms related to the proposal. However the EIS should report upon and apply them to the proposal.

Any existing relevant cumulative or strategic environmental studies should be considered when formulating and justifying undertaking a proposal. Air and water quality studies, state of the environment reports and local and regional environmental studies should also be taken into consideration as applicable.

2.2 Early assessment of options

The objectives for the proposal should be developed to fulfil any identified need and should encompass the principles of ecologically sustainable development (ESD). ESD principles (outlined in Appendix 1) should be considered when identifying options for all aspects of the proposal. All feasible alternatives that could satisfy the objectives of the proposal should be considered. When weighing up options, the biophysical, economic and social costs and benefits throughout the whole life cycle of the proposal should be considered. The 'do nothing' option should also be included in these considerations.

Careful option selection can lower community concerns and reduce potential costs of mitigation and management required to control environmental (including social) impacts. Early adoption of ecologically sustainable strategies can reduce possible conflicts, and additional costs and delays at later stages of the approval process.

2.3 Identifying issues

The general framework for an EIS is prescribed in Schedule 2 of the EP&A Regulation (see Appendix 1). The Director-General's requirements provide specific matters to be addressed in an EIS. In addition to the specific legal requirements, the proponent has a broader responsibility to consider all potential environmental issues in relation to the proposal.

As a precursor to identifying potential environmental issues, the proponent must be able to outline:

- the important characteristics of the project which will determine the scope of the potential impacts
- the proposed site and a preliminary assessment of the sensitivity of the site.

If either the project characteristics or the site should change, then the potential impacts may also change. If at any time changes occur, the scoping process for the EIS should be reviewed. If major changes occur, the Director-General may need to be reconsulted to amend their requirements.

In addition to the issues outlined in this guideline, other sources of information which may assist in the identification of potential issues include:

- any relevant guidelines produced by other NSW government authorities, e.g. *Environmental Noise Control Manual* (EPA, 1994a), other States or overseas
- EISs for similar projects, and any relevant commission of inquiry report, determination report and conditions of approval
- relevant research and reference material on similar proposals.

There are a number of approaches or mechanisms which help identify issues relating to a particular proposal in a particular location. They may involve fairly unstructured mechanisms with a low level of consultation or a structured process with a high level of consultation with all stakeholders. The choice of the approach should depend on the scale and type of proposal and the sensitivity of the environment. These may include:

- consultation outlined in Part 3
- checklist, matrix, network, GIS or overlay methods or similar approaches such as the tables in *Is an EIS required*? (Department of Planning, 1995)

2.4 Prioritising issues

The EIA process generally will benefit from focusing attention on key issues of concern. Not all issues identified will have the same degree of relevance for all proposals. The relative importance placed on different issues will vary from case to case, and is a function of the type and size of the proposal and the sensitivity of the receiving environment. Issues should therefore be prioritised according to their importance in the decision-making process.

When prioritising issues, consideration should be given to the potential severity, temporal and spatial extent of any beneficial and adverse effects; their direct impacts as well as any indirect, secondary, tertiary or cumulative impacts; and whether the effects are continuous or intermittent, temporary and reversible or permanent and irreversible.

The outcome of the identification and prioritisation process should result in:

1. **a list of all issues with a preliminary estimate of the relative significance of their impacts**
2. **identification of the key issues**
3. **an explanation as to why other issues are not considered to be key.**

The EIS should address the key issues as fully as practicable. However the level of analysis should reflect the level of significance of the impacts and their importance for the proposal. Lesser attention should be given to those issues which have lesser significance. For these latter issues, there should be sufficient analysis to develop a sustainable mitigation strategy for any potential adverse impacts.

2.5 Impact analysis, prediction and presentation

Discussion of likely impacts should include predictions of the nature and extent of potential impacts and the effectiveness of mitigation strategies. This information is fundamental to deciding the potential ecological sustainability and hence the acceptability of a particular proposal.

a) Presentation

Information provided should be clear, succinct, objective and where appropriate, supported by maps or other descriptive detail. Repetitive or general non-specific data is distracting and is not relevant to the decision-making process. The use of jargon should be avoided. It is recommended that the EIS be edited to ensure consistency of style and accuracy of transference of information from any appendices to the main document. External review of technical analysis will help ensure that the information to be included is relevant.

The EIS should make reference to all relevant studies and investigations that have been carried out in support of the proposal or other studies, reports or literature used in the EIS. These should be made available during the public display of the EIS.

b) Baseline information

Where baseline data is to be collected first-hand, careful consideration must be given to the design of the sampling program. Matters to consider include:

- the degree of understanding of the processes in question
- the reasons for the data collection program
- sampling program design
- data collection procedures
- data analysis methodologies
- relevant quality assurance procedures.

The need for long-term sampling to discern the variability of the environment should also be assessed as early as possible so that it is not overlooked or avoided due to time constraints. Assumptions and extrapolations used to draw conclusions from the data should be justified.

In some circumstances, there may be sufficient existing data available for assessment purposes without the need for additional data collection. Where existing data is used, its adequacy and appropriateness for impact assessment of the proposal should be reviewed and discussed, taking into consideration the above points for first-hand data collection. Shortfalls or uncertainty in knowledge should be clearly identified.

In all cases, sampling programs and analysis procedures should reflect current scientific approaches. Peer review of study design, sampling methodology, data analysis and interpretation of results may help identify inadequacies.

c) Predictions of impacts and mitigation

Impact prediction should consider magnitude, duration, extent, direct and indirect effects, beneficial and adverse effects and whether impacts are reversible or permanent. All predictions of impacts and the likely success of mitigation strategies have an element of uncertainty associated with them. The proponent should identify and, where possible, indicate the level of uncertainty associated with these predictions and mitigation measures. This information is fundamental in developing appropriate management strategies and informs the proponent, community, government agencies and the decision-maker of the degree of risk associated with the proposal and the importance of that risk.

When predicting impacts, a clear distinction must be made between those impacts which can be assessed quantitatively and those for which only a qualitative assessment can be made. Predictive models used should be justified in terms of appropriateness for the task, outlining its strengths and weaknesses. Whenever conclusions and recommendations have been made based substantially on judgements instead of facts or objective analytical results, the basis of the judgements should be clearly identified. A precautionary approach should be adopted where there is a significant chance a proposal may lead to irreversible consequences.

d) Reference to standards or indicators

Where possible, discussion of impact assessment and mitigation measures should make reference to recognised standards or indicators for sustainability. Standards such as the *Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC, 1992) will provide a useful reference against which to measure the acceptability of potential outcomes. In some cases, indicators may have been developed for a region or area, for instance by the Healthy Rivers Commission for specific catchments. In other cases they may be developed as a result of regional strategic environmental or cumulative studies. Some indicators for sustainability may relate to the specific characteristics of the location and can only be developed as a result of the analysis undertaken in the EIS.

e) Mitigation strategies

Mitigation strategies must be considered both in relation to individual impacts and collectively for all impacts. This helps to avoid conflict between mitigation strategies and ensures that measures applied with respect to one (or more) potential impacts do not increase the magnitude or significance of other likely impacts. The mitigation strategy should include the

environmental management principles which would be followed in the planning, design, construction and operation of the proposal and include:

- a compilation of locational, layout, design or technology features described in the EIS
- an outline of ongoing environmental management and monitoring plans.

Predictions made in the EIS should be monitored in an environmental management plan (EMP). With projects with potentially controversial environmental impacts, it may be appropriate to:

- consult with government authorities, council and the community when preparing the EMP
- establish a community committee to consult in relation to the ongoing management of the proposal
- exhibit an annual environmental management report outlining the environmental performance of the proposal.

It is not expected that a detailed EMP be prepared for the EIS. However an outline of the content and structure and commitment to prepare an EMP is required.

2.6 A question of adequacy

The NSW Land and Environment Court has made a number of observations about the adequacy of EISs during its judgements (see Gilpin, 1995). Gilpin's summary of the Court's observations includes:

- The purpose of an EIS is to bring matters to the attention of members of the public, the decision-maker, and the Department of Urban Affairs and Planning so the environmental consequences of a proposal can be properly understood
- The purpose of the EIS is to assist the decision-maker. An EIS is not a decision-making end in itself, but a means to a decision-making end
- The EIS must be sufficiently specific to direct a reasonably intelligent and informed mind to possible or potential environmental consequences
- The EIS should be written in understandable language
- The EIS should contain material which would alert both lay persons and specialists to potential problems
- An EIS would be unacceptable if it was superficial, subjective or non-informative
- An EIS would be acceptable if it was objective in its approach and alerted relevant parties to the environmental effects and community consequences of carrying out or not carrying out the proposal.

2.7 Ecologically sustainable development

Under the EP&A Regulation, it is necessary to justify the proposal having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development (ESD).

Ecological sustainability requires a combination of good planning and an effective and environmentally sound approach to design, operation and management. The proponent should have regard to the principles of ESD throughout the whole project life cycle, and especially:

- when developing the objectives for the project
- during project formulation, planning and design
- when considering project options and alternatives
- during construction
- for the operational life of the proposal
- afterwards during decommissioning, site rehabilitation and reuse.

Continual reference should be made to the question 'Is this proposal ecologically sustainable?'

3. Consultation

Early consultation with the local community, industry, councils and government agencies can be of great assistance when making a preliminary assessment of the potential viability of a proposal at a particular site. It can also assist in ensuring that the EIS is focused on those matters which will add value to the decision-making process.

Effective consultation should enable an applicant to:

- clarify the objectives for the proposal in terms of community needs and concerns, and the relationship of the proposal to any relevant strategic plans, government policy directions and statutory or planning constraints
- identify feasible alternatives (in particular alternative sites) and clarify their relative merits in terms of biophysical, social and economic factors
- identify environmental issues to:
  - prioritise the issues and identify those key to the decision-making process
  - establish the scope of the studies for key issues so that there will be adequate information for the decision-making process
  - where possible, identify performance objectives or indicators for key issues
  - when appropriate, identify experts (in government agencies or from other sources) who can assist in guiding the assessment of a key issue or peer review the assessment
- if appropriate, identify processes for continued community involvement.

The following consultation procedures are recommended:

3.1 Consultation with government agencies

It is intended that this guideline should replace the need to undertake routine consultation with government agencies on general matters to be included in an EIS, statement of environmental effects (SEE) or review of environmental factors (REF).

However, consultation with councils and relevant government agencies is recommended to help identify alternatives and to provide a preliminary view on their acceptability within the strategic context. To maximise the benefits of consultation with government authorities, requests for advice should be accompanied by adequate information on the proposal and proposed locations. The consultation request should be targeted towards identifying key issues, and should specifically relate to the particulars of the location, design and operation of the proposed facility.

To facilitate consultation with relevant government agencies, it may be appropriate to hold a planning focus meeting (PFM). The Department recommends that PFMs be held for all major or potentially controversial proposals. The principal approval authority would usually be responsible for organising the PFM. In addition to including government authorities which have an approval role, other agencies with expertise in the area, catchment management committees or independent technical experts may also need to be included depending on the location, site characteristics and management options.

For an extractive industry proposal, the following organisations should be invited to a PFM or otherwise consulted:

- **the relevant local council**
- **Department of Urban Affairs and Planning**
- **Environment Protection Authority**
- **Department of Mineral Resources**
- **Roads and Traffic Authority**
- **any relevant water authority.**

Appendix 4 lists other organisations who may need to be consulted to identify key issues for particular proposals.

For smaller projects, less formal meetings or discussions with relevant authorities, particularly the local council, should be undertaken. Issues such as whether a proposal is consistent with the council's strategic plan for the area and is permissible at the particular site should be clarified at the outset.

3.2 Formal consultation required under legislation

Under the provisions of the EP&A Regulation, an applicant or proponent must formally consult the Director-General of the Department of Urban Affairs and Planning (DUAP) regarding the content of an EIS. It is recommended that the PFM or preliminary discussions with council occur before the proponent consults the Director-General and that the minutes of the PFM or issues canvassed in the discussions be forwarded to DUAP when the Director-General's requirements are requested.

If a proposal is on land that contains a 'critical habitat' or is likely to significantly affect threatened species, populations or ecological communities or their habitats, the Director-General of National Parks and Wildlife should be consulted regarding the contents of a species impact statement (see Appendix 3 for further information).

3.3 Consultation with the community

The community likely to be affected, whether directly or indirectly, should be informed of the proposal and consulted early in the EIA process. Consultation should aim to include affected individuals, community groups and groups with special interests such as local Aboriginal Land Councils.

For major or controversial projects, a program of community consultation may need to be undertaken as part of the preparation of the EIS. This program would usually include two phases, one seeking to inform the community (for instance involving public meetings, public displays or newsletters) and one seeking to gain input on issues of community concern, to identify community values and to identify and evaluate alternatives (for instance involving community focus meetings, 'issues' workshops and community surveys).

4. Site selection procedures

Principles of site selection for quarry proposals

Consideration must be given to whether:

- **the land use is permissible**
- **environmentally sensitive areas are avoided**
- **the use is compatible with nearby land uses**
- **initial site investigations indicate the site is fundamentally suitable for a quarry.**

4.1 Site selection

The geological distribution of extractive material and its proximity to urban markets or construction sites (e.g. major infrastructure projects) are the prime factors which attract extractive industries into certain areas, often close to urban expansion. Transportation costs are a critical factor in the economic viability of extractive industries, as the materials which are high in volume, are relatively low valued resources. Extractive materials tend not to be transported over distances greater than 60 kilometres, because of the transport costs.

However, environmental factors are also important when deciding where a quarry should be located. The appropriate location of a quarry is an important environmental management tool in ensuring that the facility operates in an environmentally acceptable manner. Careful site selection will:

- reduce the potential environmental impacts and consequently, the need for impact mitigation and ongoing management measures
- reduce levels of public controversy
- avoid potential delays in the approval process.

It is recommended that the following matters be considered when selecting a site for a quarry.

4.2 Permissibility of land use

At a very early stage in the site selection process, it is essential to consult with the local council to ensure that the proposal is a permissible use under the relevant planning controls. If the proposal is not permissible under the zoning, then discussions should be held with councils about the appropriateness of changing the zoning or seeking an alternative site.

4.3 Initial site assessment

An initial assessment of the intended location can help ensure that the quarry can be operated in an environmentally acceptable manner. An initial site assessment can provide a basis for the comparative evaluation of potential sites. It is recommended that an initial assessment be undertaken prior to committing to a particular site or proceeding with a more detailed assessment in an EIS or SEE. This initial site assessment should focus on the characteristics of the site itself, as well as the surrounding environment. Matters to consider in an initial locational assessment are shown in Table 1. The list is not necessarily exhaustive. In addition to biophysical factors, the locational assessment should also consider community amenity. Conflicts often arise when the community perceives that its amenity is being threatened by particular impacts such as blasting, traffic, air or water quality impacts. Any potential conflicts and possible options for resolving them should be considered as early as possible. In general, if quarry proposals are designed to control blasting, dust and traffic impacts, there will be wider locational options.

In assessing the acceptability of a proposed site, consideration should be given to its compatibility with surrounding land uses. Consideration may need to be given to acquiring sufficient land to provide adequate on-site separation from nearby sensitive land uses. Such separation can help

Table 1. Matters to be Considered in Initial Site Assessment

Operational requirements	• Does the site provide sufficient land area for present and future requirements? • Is there easy access and transport networks of an appropriate standard? • Does the site provide for safe truck entry and exit and on-site queuing of trucks? • Is this an efficient site relative to the market? • Can services be efficiently supplied to the site e.g. power, water?
Topographic and meteorological assessment	• Are the rainfall patterns or prevailing wind directions likely to cause management difficulties? • Are the local climatic conditions (e.g. air movement, rainfall) in combination with the topography likely to result in microclimatic conditions which will adversely increase impacts on the community?
Water issues	• Are there any site constraints which make on-site water management difficult (including both process water and stormwater)? • Are there risks of surface water pollution because of the proximity or pathways to waterbodies? Can any required separation distances from waterbodies under any existing legislation or guidelines be complied with? • Are there risks of groundwater pollution because of shallow or rising groundwater tables, or proximity to groundwater recharge areas, or areas with a high vulnerability to pollution? (This will require consultation with the Department of Land and Water Conservation) • Is the site susceptible to flooding?
Flora and fauna issues	• Is there sufficient separation from environmentally sensitive areas such as national parks, nature reserves, SEPP 14 wetlands, SEPP 26 littoral rainforests, protection zones in LEPs and REPs? • Can clearing of natural vegetation be avoided? • Can clearing of vegetation of high significance be avoided e.g. vegetation used for visual screening, riparian vegetation, vegetation used as corridors for the movement of fauna? • Are threatened flora or fauna species, populations and ecological communities or their habitats liked to be affected? Will an SIS be required? • Will a development application for vegetation clearing be required under SEPP 46?
Geological or soils issues	• Are there any topographic or geological characteristics which will cause difficulties in managing impacts (subsidence, slippage, seismic)? • Are the soils highly erodible? Identify any potential sediment management problems? • Are there existing soils problems e.g. contaminated soils, acid sulfate or saline soils?
Transport issues	• Can the standard and capacity of the road network accommodate traffic likely to be generated by the proposal? • Can truck traffic avoid residential areas, hospitals, schools and commercial areas? • If inadequacies exist, can the road network or traffic management be changed to minimise any impacts particularly on residential areas?
Community issues	• Is the proposal likely to be compatible with surrounding existing or proposed land uses, particularly any residential, special uses (such as schools, hospitals, community buildings) and any sites of outstanding natural or environmental value or high tech industries? • Is there likely to be a problem in meeting sustained compliance with dust, noise or water quality requirements due to the proximity and nature of nearby land uses? • Is the proposal likely to pose health risks? • Is the proposal likely to affect the heritage significance of any Aboriginal or non-Aboriginal heritage items found or likely to be found on the site? Is the site highly visible? Will there be significant visual impacts?
Cumulative issues	• Is the proposal at this site likely to contribute to any existing cumulative problems?

minimise impacts and maintain the amenity of the surrounding areas. Factors to consider when determining appropriate separation distances include:

- the character of the surrounding environment and its sensitivity to impact
- the characteristics of the impacts, in particular their predictability
- proposed impact mitigation and management strategies and their predictability.

However, separation distances should not be viewed as the primary means of ameliorating impacts as this can lead to unnecessary land sterilisation. Instead, separation distances should be thought of in the context of a locational attribute, providing confidence that the amenity of existing land uses can be maintained. The EPA does not accept that the impacts of air and water pollution will be reduced by separation distances. Therefore, the role of site separation as an impact mitigation measure should simply reinforce the impact mitigation measures provided by other means.

5. Summary of EIS requirements

The statutory requirements for an EIS are prescribed in Schedule 2 of the EP&A Regulation (Appendix 1).

A summary of the specific requirements for an EIS for a quarry proposal are provided in the box on the right. These requirements are discussed in detail in Part 6. All issues nominated will not have the same degree of relevance for all proposals. Depending on the characteristics of the proposal, some of the requirements may be more relevant than others, while others will not be applicable at all. The EIS should be tailored to the specific proposal and should focus on the key issues.

Summary of requirements

A. Executive summary

B. The proposal
1. Objectives and characteristics of the proposal
2. Characteristics of the resource
3. Description of quarry operations
4. Site layout plans
5. Site preparation works to establish the quarry
6. Infrastructure consideration
7. Rehabilitation
8. Previous operations on the site
9. Consideration of alternatives and justification for the preferred proposal

C. The location
1. Planning information, site description and locality information
2. Overview of the affected environment

D. Identification and prioritisation of issues
1. Overview of the methodology
2. Outcomes of the process

E. The environmental issues
1. Traffic and road issues
2. Soils and geological issues
3. Water issues
4. Air quality issues
5. Noise and blasting issues
6. Flora and fauna issues
7. Heritage issues
8. Visual issues
9. Coastal issues
10. Hazards issues
11. Social and health issues
12. Economic issues
13. Cumulative issues

F. List of approvals and licences

G. Compilation of mitigation measures

H. Justification for the proposal

6. Specific requirements for an EIS

A. Executive summary

An executive summary should be provided in the EIS and should be available separately for public information. The summary should give a short overview of the proposal and the potential environmental impacts, and should include a clear map or aerial photograph of the location. It should be written in non-technical language to facilitate understanding of the proposal by the general public.

B. The proposal

1. Objectives and characteristics of the proposal

The objectives of the proposal should be clearly stated and justified in terms of ecological sustainability. The statement should refer to the:

a) extent of the quarry
b) quantity and types of material to be extracted and processed
c) products to be marketed
d) duration of the operation
e) proposed future of the site following the expiration of the proposal and any proposal for future expansion including staging and proposed timing.

2. Characteristics of the resource

The following information should be provided:

a) the geological characteristics, size and quality of any proven, possible or probable reserves
b) exploration methods (boreholes, test excavations) and summary of results
c) the depth of overburden and topsoil.

3. Description of quarry operations

A description of the proposed extraction and processing operations should include:

a) the removal of overburden
b) the staging of extraction
c) the number of benches; the slope, height, depth and width of benches; the depth of excavation; the rate of extraction; estimated daily, weekly and annual volumes of the material to be extracted and transported; constraints on increased volumes including equipment, market demand
d) employment (construction and operation)
e) hours of operation (construction, extraction, processing, transport, maintenance)
f) quantities and management of topsoil, overburden, tailings and extractive material to be stockpiled or stored
g) details of processing to be undertaken on site
h) methods of loading and transport of material within the site and from the site; access roads; any conveyors, loaders or rail links
i) quantities and method of storage of fuels and chemicals including explosives on the site; security and bunding arrangements
j) sanitary and waste disposal arrangements
k) the system of sediment dams and drains.

4. Site layout plans

Plan or plans clearly indicating the location of the following should be provided:

a) the maximum area to be disturbed at the various stages of the quarry
b) any significant vegetation communities to be cleared
c) processing, storage, loading or transport plant
d) storage areas for topsoil, overburden, extractive material
e) storage of waste, fuels, chemicals and explosives
f) the drainage network, bunding, sedimentation dams
g) safety fencing and other safety mechanisms
h) landscaping
i) parking, queuing and turning areas, weighbridge, truck wash-down areas.

5. Site preparation works to establish the quarry

Describe works prior to the quarry operations commencing. Include details of:

a) clearing, including any burning, chipping or mulching, removal and storage of overburden

— a permit may be required for clearing from the Department of Land and Water Conservation under SEPP 46 or the Protected Lands provisions of the Soil Conservation Act
b) the construction of access roads, dams, drainage and sediment control systems
c) the construction of the processing, loading or storage plant.

6. Infrastructure considerations

The following factors should be considered:

a) electricity supply; measures to protect any easements, cables, pipelines which may be impacted by the proposal
b) energy conservation measures
c) water requirements, proposed supply or storage, water recycling and reuse options
d) waste disposal requirements; proposed methods and locations for disposal
e) transport requirements.

7. Rehabilitation

The following issues should be addressed:

a) the proposed final use of the site including the final land formation plan for the site (including any sedimentation dams, drains or access roads); the general suitability of the quarry characteristics for the proposed final use and proposed rehabilitation strategy; compatibility of the proposed use with the surroundings:
   i) if landfill, materials recycling facility or contaminated soil treatment works are proposed, consider the suitability of the site with regard to groundwater, permeability of soil, type of material to be introduced onto the site; identify any constraints on the suitability of the site for this purpose and the final landform, landscaping and proposed final use of the completed landfill area
   ii) if a recreation lake is proposed, consider the appropriateness of the grading of the slopes, potential groundwater impacts, potential water quality issues because of the catchment or soil types; identify any potential long-term management problems of the lake
   iii) if agricultural purposes are proposed, consider the agronomic suitability of the proposed subsurface/topsoil profile and the drainage patterns
b) the general suitability of the soil material for rehabilitation purposes; the proposed length of storage of top soil and management to maintain viability; the measures to separate less fertile subsoil overburden from more fertile topsoil; the progressive erosion control strategy during and after rehabilitation; the proposed use of any waste from the operation in land formation
c) revegetation of all disturbed areas, during and after completion of the extractive operation including surface preparation; sowing techniques; propagation; species, rates and staging of the propagation program; any requirement for fertiliser; the need for temporary vegetation
d) the final drainage patterns
e) other matters such as provision for fencing and security
f) the monitoring and maintenance program.

8. Previous operations on the site

If applicable, outline:

a) the history of previous extraction from the site
b) past environmental performance, including the impacts of the operation on the environment and the effectiveness of any site rehabilitation
c) previous controls which applied on the site
d) the integration of the proposed development with operations previously carried out
e) restoration or rehabilitation works proposed for areas previously disturbed and the integration of these works into rehabilitation plans for the proposed operations.

9. Consideration of alternatives and justification for the preferred proposal

Consideration should include an assessment of the environmental impacts or consequences of adopting alternatives including:

a) quarry methods or technology
b) quarry design, site layout or access roads
c) management or administrative practices
d) other resource sources or locations
e) alternative rehabilitation and end use options.

The selection of the preferred options should be justified in terms of:

a) type, quality and quantities of products in relation to market demand

b) environmental factors including biophysical, economic and social factors
c) the principles of ecologically sustainable development.

C. The location

1. Planning information, site description and locality information

The following information should be provided:

a) zonings, permissibility and any land use constraints
b) compatibility of the proposal with:
   i) any regional strategy or Resource Plan of Management for extractive industries in the area
   ii) provisions of any SEPP, REP, LEP or DCP for existing and proposed development
   iii) existing land uses
   iv) any heritage items or environmental protection areas or areas affected by conservation agreements
c) title details; land tenure; owner's consent (if not the proponent)
d) where Crown land is involved, any constraint associated with the form of lease or tenure; where appropriate, the Native Title status of the land should be addressed and an outline provided of the procedures to be followed to satisfy the requirements of the Commonwealth's *Native Title Act (1993)*
e) site description and maps, plans or aerial photographs clearly identifying the location of the proposal relative to surrounding roads, adjoining communities or dwellings and any land use likely to be affected by the development; utilities including transmission lines, pipelines, cables or easements; sight lines from dwellings or public places such as roads.

2. Overview of the affected environment

An overview of the environment should be provided in order to place the proposal in its local and regional environmental context. This overview should be general. Specific details should be provided when assessing the environmental impacts of the proposal.

General information to be provided includes:

a) meteorological characteristics which may influence erosion, dust or noise impacts; these may include prevailing wind and intensity; average yearly rainfall; seasonal distribution; storm intensity; storm return period (that is, the average interval between storms of a specific magnitude)
b) surface contours and general topography (these may include slope gradient, slope length, catchment size, drainage)
c) the presence and condition of watercourses; flood liability; any water storage or drinking water catchments including groundwater bores within 1 kilometre; the watertable and the relationship to the maximum excavation depth
d) predominant native vegetation communities, any vegetation communities and their habitat value or other items of conservation value
e) the suitability of the land for agricultural purposes.

D. Identification and prioritisation of issues

1. Overview of the methodology

Outline the procedures or methodology used to identify and prioritise issues. Factors to consider may include:

a) the outcome of a review of relevant sources of information on potential issues including:
   i) any relevant guidelines produced by NSW government authorities, relevant guidelines from other States or overseas, any industry guidelines
   ii) EISs for similar projects, any relevant commission of inquiry reports, determination reports and conditions of approval, relevant research or reference material
   iii) relevant strategic plans or policies
   iv) relevant preliminary studies or pre-feasibility studies
b) the outcome of consultation with stakeholders including planning focus meetings, community focus meetings, community workshops or issues groups, meetings with stakeholders (e.g. government agencies, particularly EPA, councils, major market representatives)
c) the use of methodology such as *Is an EIS required?* (Department of Planning, 1995) or checklists or similar approaches

2. Outcomes of the process

Summarise the outcome of the identification and prioritisation process including:

a) all the issues identified
b) the key issues which will need a full analysis in the EIS (including comprehensive baseline assessment)
c) the issues which will not need a full analysis in the EIS though they may be addressed in the mitigation strategy; the justification for the proposed level of analysis.

E. The environmental issues

The following specific issues are nominated as being potentially important when assessing impacts, and for decision-making in relation to quarries. The outline of the issues is not exhaustive and the degree of relevance of each will vary. The EIS should only deal with relevant issues as applicable to the particular proposal.

Assessment of potential impacts

The following should be included for any potential impact which is relevant for the assessment of a specific proposal:

- **a description of the existing environmental conditions (baseline conditions)**
- **a detailed analysis of the potential impacts of the proposal on the environment; the analysis should indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the impacts**
- **the proposed mitigation, management and monitoring program, including the level of confidence that the measures will effectively mitigate or manage the impacts.**

With each issue, the level of detail should match the level of importance of the issue in decision-making.

1. Traffic and road issues

A traffic impact study should be undertaken for all operations involving significant numbers of truck movements including:

a) the estimated average and maximum hourly, daily and weekly truck movements; proposed truck types and sizes; if trucks will arrive or leave in convoy or queue to enter the site or need to wait outside the quarry gate
b) proposed truck routes and possible alternative routes or transport modes, e.g. conveyer belts, rail
c) the physical condition of the roads or bridges on the proposed routes and upgrading proposals
d) the measures to prevent sediment transport off-site via transport vehicles including shakedown areas or properly controlled truck wash facilities
e) the potential impact on the road maintenance program
f) road safety issues; include:
   i) other major road users, peak periods of use and potential conflicts; use of the truck routes by school buses and the location of schools and bus stops
   ii) any sight distance constraints for:
      - turning traffic into or from the quarry access road
      - any relevant uncontrolled intersections, road junctions or railway crossings
   iii) proposed measures to improve safety including:
      - any possible realignment of roads
      - any need to improve sight distance or intersections or crossings
      - any need to restrict hours of truck movement, the number of trucks per day or the load size on certain routes.

2. Soils and geological issues

Issues which may need to be considered include:

a) describing existing surface, geological and soil characteristics, including a soils survey of areas to be affected by the proposal, indicating profile characteristics which may be relevant for the sustainable management of the proposal; these include:
   i) a review of contours, terrain stability, slope gradient and length
   ii) a survey of the physical and chemical properties such as soil depth, particle size distribution, permeability, dispersibility, hydraulic conductivity or aggregate stability, relevant chemical properties such as pH, salinity; suitability for revegetation (the Department of Land and Water Conservation (DLWC) has soil landscape maps for some parts of the State)
   iii) a review of the site history to identify

likely contaminated sites (refer to the EPA's contaminated land register, council's unhealthy building land list and previous land use); naturally occurring contaminants; existing level of site contamination including the type and extent of contamination if possible

iv) reviewing DLWC's Acid Sulfate Soil Risk Maps to determine if acid sulfate soils are likely to occur on the site; if likely, undertake a soil survey in accordance with *Assessing and Managing Acid Sulfate Soils* (EPA, 1995).

b) describing the potential direct or indirect effects on soils, and any constraints on the proposal due to soil or geological characteristics including:
   i) the potential for erosion having regard to the soil characteristics, landform and meteorological characteristics; issues relating to bed and bank stability at creek crossings
   ii) the potential subsidence, settling, slippage or structural problems due to shear planes, fault lines or other structural weaknesses
   iii) the suitability of the topsoil for landscaping purposes, considering soil fertility
   iv) the potential for acid related issues due to the presence of acid sulfate soils, considering:
      ï the disturbance of sulfidic material or extracted material containing sulfidic material
      ï impacts from alteration of watertable levels
      ï acid run-off from stockpiles or the acidification of sulfidic fines
      ï sale or use of material containing pyritic material — refer to *Assessing and Managing Acid Sulfate Soils* (EPA, 1995) and RTA's Acid Sulphate Soil Policy 1996)
   v) if contaminated soils on the site, need for remediation

c) proposed measures to mitigate soils impacts including:
   i) proposed erosion management plan considering:
      • measures to prevent wind and water erosion including programming of works to minimise the need for soil stockpiling and to minimise the area denuded at any one time, use of techniques for stripping topsoil and subsoils which will minimise erosion
      • stabilisation works for cuttings, embankments, trenches and open channels
      • stockpile management measures including wind and water erosion control measures; surface stabilisation measures for stockpiles such as mulching or temporary vegetation to prevent erosion; proposed stockpile batter grades
      • surface drainage and sediment control measures; control of run-off on to, through and from the site; measures to dissipate energy and for scour protection
      • re-vegetation and rehabilitation measures
      • a maintenance program of all erosion control works
   ii) if relevant, the proposed management program to mitigate potential impacts from disturbance of acid sulfate soils, including minimisation of disturbance of the material or the watertable; treatment of disturbed soils or acid water; monitoring program and response strategies should deleterious impacts be observed
   iii) if relevant, the level of remediation; proposed methods for remediation; a monitoring program to track the decontamination progress
   iv) if relevant, measures to avoid causing site contamination during the construction and operation of the facility and remediation measures if contamination occurs.

d) considering the acceptability of impacts and assessing the adequacy of the mitigation strategies during construction and operation of the proposal to control soil and geological impacts.

3. Water issues

Issues to consider include:

a) a description of potential sources of water pollution such as:
   i) increased turbidity due to sediment loss and erosion from stockpiles, haul roads or other disturbed areas
   ii) sewage
   iii) workshop, vehicle wash facilities, plant and equipment, fuel storage

iv) impurities, incidental minerals or other leachates from the disturbed rocks and soil

b) the condition of any natural waterbodies, wetlands, coastline or environmentally sensitive areas which could be impacted by:
   i) any change in surface water or groundwater hydrology as a result of the proposal
   ii) any change in the water quality as a result of any activity on the site
   iii) dust from the quarry or traffic

c) the drainage and sediment management system including:
   i) a drainage system to divert uncontaminated surface water including stormwater or streams around or away from the quarry and other disturbed areas
   ii) measures to control water flow within the impacted area with given 'intensity-frequency duration' assumptions to minimise the volume, slope and speed of water flow and the transmission of sediment (these may include water diversion banks or canals, settlement ponds, sediment or pollution traps, trickle pipes or flumes)
   iii) sedimentation dams to contain run-off from the quarry or any processing area including water from storm events and the non-filterable residues from stormwater overflows — the system should be designed to minimise the risk of discharge of contaminated water
   iv) an assessment of the need to treat (chemically or by other methods) contaminated stormwater or process water because of the level of fines or other pollutants prior to reuse or discharge
   v) proposed maintenance works, including methods of dewatering slimes or fines ponds; proposals to store sludge, fines or slimes and use of the area
   vi) temporary sediment controls including a sequence of sediment traps and filters to effectively allow for increased retention time of drainage water during construction, to maximise settling time of sediment laden run-off
   vii) controls to prevent contamination of water from accidental spillages of petroleum products or other chemicals

d) water balance, including:
   i) the dependence on off-site water sources and the potential impact of water usage from any river or stream or groundwater sources
   ii) wastewater storage and reuse including irrigation of landscaping, truck wash down, demonstrating an ability to avoid dry weather discharge; outlining a strategy of water use and reuse so that the water level is reduced in the dam to restore its capacity as quickly as possible

e) potential impacts on groundwater, considering:
   i) the quantity, quality and depth of the watertable
   ii) any adverse effects on groundwater recharge areas
   iii) the likely transference of any pollutants to groundwater
   iv) if extraction is below the watertable

f) when dewatering of the quarry or pit is proposed to facilitate extraction, any effects on the local or regional watertable

g) the adequacy of measures to ensure the watertable will not become contaminated during and after extraction because of the final reuse of the area

h) the impact on the aquifer intake area and the adequacy of the protection of this area

i) a plan for the ongoing maintenance and monitoring of water quality controls to ensure their correct installation, operation and effectiveness.

4. Air quality issues

Issues to consider include:

a) identifying fixed and mobile sources of air pollution such as extraction, processing, handling, storage or transport operations

b) the likely impact of the proposal on the local and regional air quality

c) if air quality is a significant issue:
   i) baseline data on the ambient quality of the air
   ii) projected dust emission and deposition rates
   iii) frequency and times of emissions

d) meteorological conditions under which nearby dwellings and sensitive land are likely to be affected

e) mitigation and management measures to control the generation of dust and to ensure compliance with air quality standards including:
   i) ceasing dust generating activities during certain meteorological conditions

ii) sealing or watering of roads
iii) dust control measures on open stockpiles, processing and loading areas
iv) planting of landscaping to reduce the wind impacts

f) a dust monitoring program.

5. Noise and blasting issues

Issues to consider include:

a) the existing acoustic environment including a statistical breakdown of the meteorological conditions (predominant wind, temperature, humidity and inversion details) and any topographical features which will influence the noise or vibration impacts
b) proposed hours of operation and traffic movements
c) noise levels (including 1/3 octave spectra and sound power levels) from fixed and mobile noise sources
d) predicted noise levels at potentially affected dwellings
e) mitigation and management measures to control the generation of noise and to ensure compliance with relevant noise standards, including details of noise control measures such as:
   i) suppressors or silencers on equipment
   ii) any bunding (size, type and location) or noise shield proposals
   iii) alternative locations of plant, weighbridges, parking, queuing or truck routes to reduce noise
   iv) alternative grading of the road to reduce sharp transitions of gradient and reduce the impacts from brake and gear change noise
   v) management strategies to reduce impacts including truck speed, air brakes
f) for proposals involving blasting:
   i) identification of any dwellings or residential zones within approximately 2 kilometres of the site
   ii) management strategies for drilling and blasting, including maximum instantaneous charge; site factors; firing patterns and delays; frequency of blasting; results of trial blasts
   iii) predicted overpressure and ground vibration at neighbouring dwellings
   iv) mitigation and management measures to control the generation of blasting impacts and to ensure compliance with relevant blast overpressure and ground vibration standards; proposed mitigation measures such as:
      - management criteria of suitable weather conditions for blasting
      - notice of blasting
      - controls to reduce blasting impacts including the size of blast, blast hole patterns, depth and direction of blast holes
      - measures to minimise fly rock
g) the proposed monitoring program.

6. Flora and fauna issues

If land is to be cleared or vegetation or fauna habitats are likely to be disturbed, issues to consider include:

a) identifying plant and animal habitats and ecological communities and, where appropriate, populations and species in areas that may be directly or indirectly affected by the proposal
b) indicating the local and regional scarcity of these habitats, ecological communities, populations and species — if relevant identify the following, indicating their incidence on the site:
   i) threatened species, populations or ecological communities listed in Schedule 1 or 2 of the *Threatened Species Conservation Act 1995* (see Appendix 3)
   ii) rare plant species listed in *Rare or Threatened Australian Plants* (ROTAP) (Briggs, J.D. 1988)
   iii) areas protected under SEPP 14 — Coastal Wetlands, SEPP 26 — Littoral Rainforest, SEPP 44 — Koala Habitat Protection or other environmental planning instruments
   iv) vegetation or fish species protected under the *Fisheries Management Act 1994*, indicating the economic significance of any potentially affected fish species
   v) trees listed in councils' Significant Tree Registers
c) potential impacts on species, populations or ecological communities or their habitats:
   i) directly through removal by clearing
   ii) indirectly through changes in water quantity, quality or groundwater regime
   iii) through impacts on the number, distribution and size of habitats

d) the sensitivity of species or communities to disturbance; the potential impacts of disturbance on biodiversity; the potential for recolonisation following rehabilitation — if relevant assess the significance of the area for koalas under the provisions of SEPP 44 — Koala Habitat Protection
e) the significance of flora or fauna for other biota, including biota not directly affected by the proposal but which interact with potentially disturbed flora and fauna
f) landscaping and rehabilitation proposals and their role in mitigating impacts such as compensatory rehabilitation with indigenous species; provision of new appropriate habitats; opportunities for colonisation; timing of major disturbances
g) identifying potential weed and introduced species and describing measures to control and prevent spread into localities adjacent to the proposal
h) proposed monitoring to determine the effectiveness of mitigation and to verify predictions.

Note: Appendix 3 provides guidance on determining when a species impact statement (SIS) is required. An SIS must accompany any proposal in critical habitats or where there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats.

7. Heritage issues

This section is relevant if land clearing, earthworks, disturbance of existing items (buildings, works, relics or places) or reduction of the heritage curtilage will occur as a result of the proposal. Issues which may need to be considered include:

a) identifying any items of heritage significance on the site (including underwater) and in the area affected by the proposal. This should include two steps:
Step 1: collate information from any relevant heritage study or conservation plan for the site or area — this source may need to be supplemented with information from the following:
i) relevant historical research on the area
ii) consultation with the Aboriginal Land Council, local historical societies and the local council
iii) inspection of heritage registers, schedules, databases or lists, Heritage Council Register, heritage and conservation registers (various government agencies), local or regional environmental plans, archaeological zoning plans, Aboriginal Sites Register (National Parks and Wildlife Service (NPWS)), National Estate Register (Australian Heritage Commission), other registers (National Trust, Institution of Engineers Australia, Royal Australian Institute of Architects)
Step 2: survey the area likely to be affected, to identify any items of potential heritage significance.

For non-Aboriginal heritage:

a) assess the significance of any non-Aboriginal heritage items identified on the site, using criteria for assessing heritage significance published in the *NSW Heritage Manual 1996*
b) assess the potential impacts of the proposal on the heritage significance — non-Aboriginal heritage items, protected under the *Heritage Act 1977* or a conservation instrument, require approval from the Heritage Council before disturbance can be undertaken; items identified in planning instruments require the consent of the nominated consent authority (usually council); shipwrecks protected under the *Historic Shipwrecks Act 1976* require the approval of the Director of the NSW Heritage Office
c) propose measures to mitigate impacts to conserve items of heritage significance — if items of significance are to be disturbed a conservation management plan may need to be prepared in consultation with the Heritage Office.

For Aboriginal heritage:

a) assess the archaeological and anthropological significance of any Aboriginal relic or place identified on the site in consultation with the Land Council, Department of Aboriginal Affairs and NPWS
b) assess the potential impact of the proposal on the heritage significance; Aboriginal relics or places cannot be disturbed without written consent from the Director-General of National Parks and Wildlife
c) propose measures to mitigate impacts or to

conserve the heritage significance of the area, relic or place — if items of significance are to be disturbed, a conservation management plan may need to be prepared in consultation with the NPWS, Land Councils, the Department of Aboriginal Affairs and the Heritage Office.

For natural heritage:

a) assess the heritage significance of any natural areas including geological or palaeontological features or ecological communities
b) assess the potential impact of the proposal on the heritage significance (note: items identified in planning instruments or in conservation areas require the consent of the nominated approval authority)
c) propose measures to mitigate impacts or to conserve the heritage significance — if natural areas of heritage significance are to be disturbed a conservation management plan may need to be prepared in consultation with the relevant authorities.

Consider the acceptability of impacts on heritage significance and assess the adequacy of the measures to mitigate impacts during all stages of the proposal.

8. Visual issues

For extractive industries undertaken in areas where visual impacts are a concern, issues to consider include:

a) considering the site in relation to any landscapes of local or regional significance as considered from the fore, middle and background
b) visibility from adjoining properties and the surrounding areas
c) lighting impacts from lights for security and night operations
d) visual impacts from the clearing of vegetation; exposure of rock faces; shape, location or size of stock piles; location, colour
e) the form and bulk of the plant; the location of access roads and fences
f) the location of waste dumps or derelict equipment
g) the orientation of the quarry face relative to sighting lines
h) proposed landscaping to reduce visual impacts; the location, layout and composition of intending screening species.

9. Coastal issues

For extractive industries undertaken within the coastal zone, the following issues should be considered:

a) any relevant issues in the New South Wales Coastal Policy
b) impacts from extractive industry activities on the beach or coastal dune fields including from short-term erosion or long-term recession.

10. Hazards issues

Consider the following potential hazards:

a) accidental release of toxic substances, explosions or fires
a) natural events (including bushfire, landslip, flooding or subsidence).

All potential hazards and associated scenarios should be identified, and the significance of their consequences assessed.

For quarries using explosives, the need for a preliminary hazard analysis (PHA) should be considered. The procedure identified in *Applying SEPP 33* (Department of Planning, 1994) should be considered. If a PHA is required, it should be prepared in accordance with *Hazardous Industry Planning Advisory Paper (HIPAP) No. 6 — Guidelines for Hazard Analysis* (Department of Planning, 1992a), and *HIPAP No. 4 — Risk Criteria for Land Use Safety Planning* (Department of Planning, 1992b). Most important elements of a PHA include:

a) a list of dangerous goods to be used and the rate of usage (fuels or explosives), details of quantities stored; storage and transport arrangements for materials
b) a brief description of procedures involving dangerous goods; a comprehensive identification of possible causes of potentially hazardous incidents and their consequences to public safety or the environment from the storage or use of hazardous chemicals; an outline of all operational and organisational safety controls.
c) the consequences in relation to public safety or impact on the environment if a hazardous event were to occur
d) a quantified risk assessment
e) identifying hazard mitigation measures; assessing the adequacy of operational and emergency procedures involving dangerous and hazardous goods.

For sites located in a flood prone areas, the following hazard issues should be considered:

a) flooding status, including the likely frequency of flooding and depth of flooding
b) if flood liable:
   i) the direction of flood flow; the vulnerability of the storage, batching and waste management facilities
   ii) potential impacts from inundation of the facility including the management of contaminated waters; means to prevent breakthrough during floods from any pits, slime or settlement ponds into adjacent waterways
   iii) the potential for the proposal to increase the flood liability of surrounding land; the assessment of potential impacts of any increased flooding levels
   iv) any proposed flood mitigation measures that may influence the impacts of the proposal on the environment.

For quarries located in areas of other natural risks including high bushfire risk, the following issues should be considered:

a) an assessment of the risks given the climate, surrounding topography, vegetation, geological formation and on-site management practices
b) an assessment of the likely performance of the quarry and potential environmental impacts during exposure to natural hazards, taking into consideration:
   i) design and layout
   ii) protocols to reduce the risks of on-site fires including firebreaks; provision for firefighting on the site including access, water supply and firefighting equipment
   iii) provision for training and maintenance
c) hazard mitigation measures — these will be dependent upon the extent of the hazards identified.

11. Social and health issues

For extractive industries located to result in potential impacts on residential communities, the following issues should be considered:

a) social impacts as a result of changes in employment patterns
b) social impacts resulting from changes in the amenity of the area
c) impacts on the health of the community from any potential changes in the air quality, noise and vibration regime and safety on the roads.

12. Economic issues

Issues to consider include:

a) cost and benefits to the community as a result of the quarry taking into consideration environmental impacts identified in the EIS as well as the project factors — significant non-monetary costs and benefits should be described and qualitatively assessed; if a major issue, the analysis should consider:
   i) the potential economic impacts, as a result of this proposal proceeding, on the availability and cost of building or construction material and on the recycling of building and construction wastes; market demand; an analysis of regional supply; future demand for the types of material present on the site
   ii) flow-on costs from the need to upgrade any infrastructure; the offset of s. 94 contributions or other contributions for the provision or upgrading of infrastructure
   iii) any additional employment as a result of the proposal
   iv) the potential impact on property values
b) any proposal for a performance bond — any bond could consider failure of safeguards resulting in a significant environmental impact.

13. Cumulative issues

Cumulative impacts may result from a number of activities with similar impacts interacting with the environment in a region. They may also be caused by the synergistic and antagonistic effects of different individual impacts. They may be due to the temporal or spatial characteristics of the activities and impacts. Issues to consider that relate to extractive industry proposals include:

a) identifying other existing extractive industries in the area or on the site within the last five years; identifying other forms of industry in the vicinity
b) the extent to which the surrounding environment is already stressed by existing development; the potential for cumulative impacts from:
   i) other existing extractive industry activities in the area/region
   ii) other activities with similar impacts

c) any advantages or disadvantages from clustering industry in the area considering the environmental characteristics
d) any likely long-term and short-term cumulative impacts having regard to air quality, noise or traffic disturbance, visual impacts, surface water and groundwater issues, public health or loss of heritage items, vegetation or fauna habitat
e) consideration of the receiving environment's ability to achieve and maintain environmental objectives.

F. List of approvals and licences

All approvals and licences required under any legislation must be identified. This is to alert other relevant authorities as early as possible to their potential involvement in the project and to ensure an integrated approach to the granting of approvals. This list also identifies for the community, the relevant authorities involved in the assessment and regulation of the proposal.

G. Compilation of mitigation measures

A critical component in the EIS is the mitigation strategy which demonstrates how the proposal and its environmental safeguards would be implemented and managed in an integrated and feasible manner. It is also essential to demonstrate that the proposal is capable of complying with statutory obligations under other licences or approvals.

The mitigation strategy should include the environmental management principles which would be followed when planning, designing, establishing and operating the proposal, and include:

- specific locational, layout, design or technology features (which are described under each of the key issues) and
- an outline of ongoing management and monitoring plans.

Mitigation strategies for the establishment and operation stages of the project should be distinguished and in some circumstances, separate environmental management plans prepared.

An environmental management and rehabilitation plan

An Environmental Management and Rehabilitation Plan (EM&RP) is a document designed to ensure that the commitments in the EIS, subsequent assessment reports, and approval or licence conditions are fully implemented. It is a comprehensive technical document which is usually finalised during or following detailed design of the proposal after approval of the development application. It should take into consideration any existing plan of management for the whole extractive industry resource. It should provide a comprehensive framework for managing or mitigating environmental impacts for the duration of the quarry's operation.

Although the level of detail required for an EM&RP, is usually not considered necessary for the EIS or SEE, the documents should contain a comprehensive outline of the structure of the EM&RP, including the environmental management principles which would be followed when planning, designing, constructing and operating the proposal. It should be noted that with key issues, where there are high levels of risk or uncertainty, it may be essential to present details of how these issues would be managed in the EIS. At the development approval stage, it is essential for the applicant to establish that the environmental impacts can be managed in an integrated and feasible manner.

With major or controversial projects, it may be appropriate to:

- establish a community committee to consult in relation to the ongoing management and monitoring of the proposal
- plan to exhibit an annual environmental management report outlining the environmental performance of the proposal.

The EM&RP should provide a framework for managing or mitigating environmental impacts for the life of the proposal. It should also make provisions for auditing the effectiveness of the proposed environmental protection measures and procedures. Two sections should be included, one setting out the program for managing the proposal (section a. below), and the other outlining the monitoring program with a feedback loop to the management program (section b. below).

a) Outline of an environmental management and rehabilitation plan

The management strategy should demonstrate sound environmental practice during the establishment, operation, rehabilitation and end use of the quarry facility, including:

i) management of site establishment impacts; if appropriate, erosion and sedimentation management and revegetation plans for areas disturbed by activities
ii) management of operational impacts; if appropriate, include:
  - stockpile management
  - management of explosive, chemicals and fuel and their use
  - water, dust and erosion management
  - transport management
  - maintenance and site security plans
  - contingency plans to respond to emergencies, incidents or any breakdown in environmental performance

iii) progressive rehabilitation of the site and final end use
iv) strategies to feed information from the monitoring program back into the management practices and action plans to improve the environmental performance and sustainability of all components of the proposal
v) training programs for operational staff and incentives for environmentally sound performance
vi) an indication of how compliance with licensing and approval requirements will be achieved and due diligence attained
vii) if applicable, a reporting mechanism on environmental performance and performance bond and relevant performance parameters.

b) Monitoring outline

This program should be carefully designed and related to the predictions made in the EIS and the key environmental indicators which would demonstrate the potential ecological sustainability of the proposal. The EIS should outline the need for and use of any proposed monitoring, monitoring intervals and reporting procedures.

Parameters which may be relevant include:

i) performance indicators in relation to critical operational issues including:
  - quality of water discharged
  - noise and dust
  - any relevant public health indicators

ii) waste management; performance indicators in relation to recycling and reuse
iii) monitoring of complaints received

The program outline should describe the following monitoring details:

i) the key information that will be monitored, its criteria and the reasons for monitoring (which may be compliance with regulatory requirements)
ii) the monitoring locations, intervals and duration
iii) procedures to be undertaken if the monitoring indicates a non-compliance or abnormality
iv) internal reporting and link to management practices and action plans
v) reporting procedures to relevant authorities and, if appropriate, to the consent authority and the community.

H. Justification for the proposal

Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts, and compliance with the principles of ecologically sustainable development.

The principles of ecologically sustainable development are:

a) the precautionary principle — namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
b) inter-generational equity — namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
c) conservation of biological diversity and ecological integrity
d) improved valuation and pricing of environmental resources.

The sustainability of the proposal should be outlined in terms of the ability of the proposal to:

a) meet project objectives
b) demonstrate efficiency and sound environmental performance in resource

management to meet the short- and long-term community requirements for extractive material

c) meet site specific environmental performance requirements considering the vulnerability of the groundwater, surface waters, soil, ecological communities, heritage or social factors

d) safeguard public health.

Appendix 1. Schedule 2 — Environmental Impact Statements

This appendix contains an extract from the *Environmental Planning and Assessment Regulation* 1994. Schedule 2 outlines the matters that must be addressed in an EIS pursuant to clauses 51 and 84 of the EP&A Regulation.

1. A summary of the environmental impact statement.
2. A statement of the objectives of the development or activity.
3. An analysis of any feasible alternatives to the carrying out of the development or activity, having regard to its objectives, including:
   a) the consequences of not carrying out the development or activity; and
   b) the reasons justifying the carrying out of the development or activity.
4. An analysis of the development or activity, including:
   a) a full description of the development or activity; and
   b) a general description of the environment likely to be affected by the development or activity, together with a detailed description of those aspects of the environment that are likely to be significantly affected; and
   c) the likely impact on the environment of the development or activity, having regard to:
      i) the nature and extent of the development or activity; and
      ii) the nature and extent of any building or work associated with the development or activity; and
      iii) the way in which any such building or work is to be designed, constructed and operated; and
      iv) any rehabilitation measures to be undertaken in connection with the development or activity; and
   d) a full description of the measures proposed to mitigate any adverse effects of the development or activity on the environment.
5. The reasons justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.
6. A compilation (in a single section of the environmental impact statement) of the measures referred to in item 4 (d).
7. A list of any approvals that must be obtained under any other Act or law before the development or activity may lawfully be carried out.

Note: For the purposes of this Schedule, **"the principles of ecologically sustainable development"** are as follows:

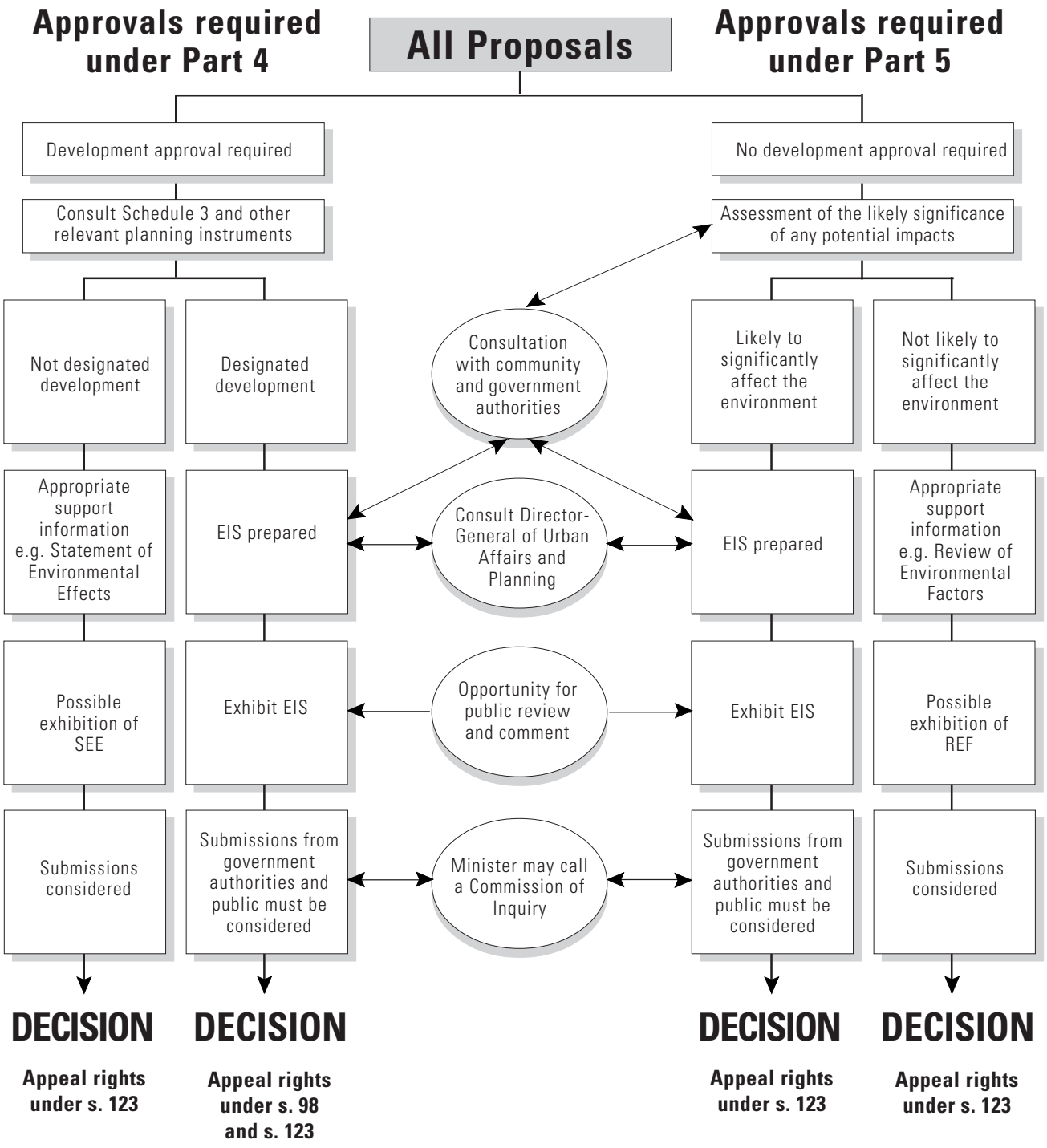
a) The precautionary principle — namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
b) Inter-generational equity — namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
c) Conservation of biological diversity and ecological integrity.
d) Improved valuation and pricing of environmental resources.

Note: The matters to be included in item 4 (c) might include such of the following as are relevant to the development or activity:

a) the likelihood of soil contamination arising from the development or activity;
b) the impact of the development or activity on flora and fauna;
c) the likelihood of air, noise or water pollution arising from the development or activity;
d) the impact of the development or activity on the health of people in the neighbourhood of the development or activity;
e) any hazards arising from the development or activity;
f) the impact of the development or activity on traffic in the neighbourhood of the development or activity;

g) the effect of the development or activity on local climate;
h) the social and economic impact of the development or activity;
i) the visual impact of the development or activity on the scenic quality of land in the neighbourhood of the development or activity;
j) the effect of the development or activity on soil erosion and the silting up of rivers or lakes;
k) the effect of the development or activity on the cultural and heritage significance of the land.

Appendix 2. EIA procedures under the EP&A Act



Appendix 3. Threatened Species Conservation Act

This appendix contains an extract from the *Threatened Species Conservation Act 1995* and the provisions for assessing impacts on the conservation of critical habitats and threatened species, populations or ecological communities and their habitats.

What are critical habitats, threatened species, populations or ecological communities and threatening processes?

Critical habitats are prescribed in Part 3 of the *Threatened Species Conservation (TSC) Act 1995*. Threatened species, populations or ecological communities and threatening processes are prescribed in Part 2 and Schedules 1 and 2 of the TSC Act.

When is a Species Impact Statement required?

Under section 77 (3) (d1) and section 112 (1B) of the EP&A Act, if a proposal:

- is on land that contains a "critical habitat" or
- is likely to significantly affect threatened species, populations or ecological communities, or their habitats,

a species impact statement (SIS) must be prepared in accordance with Division 2 of Part 6 of the *TSC Act*.

Factors when deciding if an SIS is required

The following factors must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats:

a) in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction,
b) in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised,
c) in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed,
d) whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community,
e) whether critical habitat will be affected,
f) whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region,
g) whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,
h) whether any threatened species, population or ecological community is at the limit of its known distribution.

Form and content of an SIS

Under section 110 of the TSC Act, the general requirements on the form and content of an SIS are as follows.

General information

1. A species impact statement must include a full description of the action proposed, including its nature, extent, location, timing and layout and, to the fullest extent reasonably practicable, the information referred to in this section.

Information on threatened species and populations

2. A species impact statement must include the following information as to threatened species and populations:
   a) a general description of the threatened species or populations known or likely to be present in the area that is the subject of the action and in any area that is likely to be affected by the action,
   b) an assessment of which threatened species or populations known or likely to be present in the area are likely to be affected by the action,
   c) for each species or population likely to be affected, details of its local, regional and State-wide conservation status, the key threatening processes generally affecting it, its habitat requirements and any recovery plan or threat abatement plan applying to it,
   d) an estimate of the local and regional abundance of those species or populations,
   e) a general description of the threatened species or populations known or likely to be present in the area that is the subject of the action and in any area that is likely to be affected by the action,
   f) a full description of the type, location, size and condition of the habitat (including critical habitat) of those species and populations and details of the distribution and condition of similar habitats in the region,
   g) a full assessment of the likely effect of the action on those species and populations, including, if possible, the quantitative effect of local populations in the cumulative effect in the region,
   h) a description of any feasible alternatives to the action that are likely to be of lesser effect and the reasons justifying the carrying out of the action in the manner proposed, having regard to the biophysical, economic and social considerations and the principles of ecologically sustainable development,
   i) a full description and justification of the measures proposed to mitigate any adverse effect of the action on the species and populations, including a compilation (in a single section of the statement) of those measures,
   j) a list of any approvals that must be obtained under any other Act or law before the action may be lawfully carried out, including details of the conditions of any existing approvals that are relevant to the species or population.

Information on ecological communities

3. A species impact statement must include the following information as to ecological communities:
   a) a general description of the ecological community present in the area that is the subject of the action and in any area that is likely to be affected by the action,
   b) for each ecological community present, details of its local, regional and State-wide conservation status, the key threatening processes generally affecting it, its habitat requirements and any recovery plan or any threat abatement plan applying to it,
   c) a full description of the type, location, size and condition of the habitat of the ecological community and details of the distribution and condition of similar habitats in the region,
   d) a full assessment of the likely effect of the action on the ecological community, including, if possible, the quantitative effect of local populations in the cumulative effect in the region,
   e) a description of any feasible alternatives to the action that are likely to be of lesser effect and the reasons justifying the carrying out of the action in the manner proposed, having regard to the biophysical, economic and social considerations and the principles of ecologically sustainable development,
   f) a full description and justification of the measures proposed to mitigate any adverse effect of the action on the ecological community, including a compilation (in a single section of the statement) of those measures,
   g) a list of any approvals that must be obtained under any other Act or law before the action may be lawfully carried out, including details of the conditions of any existing approvals that are relevant to the ecological community.

Credentials of persons undertaking an SIS

4. A species impact statement must include details of the qualifications and experience in threatened species conservation of the person preparing the statement and of any other person who has conducted research or investigations relied on in preparing the statement.

State-wide conservation status

5. The requirements of subsections (2) and (3) [above] in relation to information concerning the State-wide conservation status of any species or population, or any ecological community, are taken to be satisfied by the information in that regard supplied to the principal author of the species impact statement by the NPWS, which information that Service is by this subsection authorised and required to provide.

Procedures for preparing an SIS

Under Section 111 of the TSC Act, the Director-General of National Parks and Wildlife must be consulted in writing for the requirements for an SIS. These requirements must be provided within 28 days from when a request is made.

Because of the circumstances of the case, the Director-General of National Parks and Wildlife may limit or modify the extent of matters prescribed in Section 110. In other cases if the impacts are considered to be trivial or negligible, the Director-General of National Parks and Wildlife may dispense with the requirement for an SIS to be prepared.

An SIS may be prepared as a separate document or incorporated in an EIS. If the SIS is separate to the EIS, it must be exhibited concurrently with the EIS.

The SIS must be in writing and be signed by the principal author of the document and the applicant/proponent.

Appendix 4. Consultation and approvals

It is the responsibility of the person preparing the EIS to determine what approvals will be required as a result of the proposal and to demonstrate that the proposal can meet all approval and licensing requirements. In preparing the EIS, consultation with relevant parties should be undertaken early in the EIA process and their comments taken into account in the EIS.

Approvals or consultation which may be required include:

local councils for development approvals under Part 4 of the EP&A Act and any building approval under the *Local Government Act 1993*, also for any alteration to local roads or buildings or trees of local heritage significance

Department of Urban Affairs and Planning for concurrence if the proposal impacts on SEPP 14 — Coastal Wetlands, SEPP 26 — Littoral Rainforest, potential or actual koala habitat under SEPP 44 — Koala Habitat Protection

Environment Protection Authority for air, water and noise licences, approvals and certificates of registration under relevant pollution control legislation; regulation of waste generation, transportation and disposal; licences for transport of dangerous goods under the Dangerous Goods Act; licences for chemicals subject to chemical control orders under the Environmentally Hazardous Chemicals Act

Department of Land and Water Conservation
Soil and Vegetation Management for information on soils; design and construction of erosion and sediment controls and rehabilitation; approvals on protected lands;
State Lands Services regarding effect of development on any Crown land; for leasing, licence, or purchase; whether the land is subject to Aboriginal land claim or Native Title legislation; if Crown Reserves and dedicated lands exist, whether the proposal is compatible with the stated public purpose;
State Water Management regarding impact on ground or surface water resources; clearing riparian vegetation; works within 40 metres of a stream;
Coastal and Rivers Management regarding flooding and coastal areas;
Water Services Policy regarding approvals under the *Local Government Act 1993*

relevant service authorities such as water, electricity, gas, telecommunication, drainage, flood mitigation, sewerage or other utility organisations

National Parks and Wildlife Service if land clearing or impacts on natural vegetation are likely, particularly in relation to the provisions of the Threatened Species Conservation Act; or if sites of Aboriginal heritage significance or land managed by the Service are likely to be affected

NSW Fisheries if fish or fish habitat is affected (including dredging or reclamation works, impeding fish passage, damaging marine vegetation, desnagging, use of explosives or other dangerous substances in or adjacent to a waterway which may result in fish kills)

NSW Agriculture if the proposal is on land with high agricultural value or will cause dislocation to the agricultural industry

NSW Health Department with regard to the potential health hazard caused by the operation and siting of the facility

WorkCover for responsibilities regarding handling of dangerous goods and hazardous substances

Heritage Council of NSW if the proposal is likely to affect any place or building having State heritage significance or if the proposal is affected by Interim Conservation Orders (ICO) or Permanent Conservation Orders (PCO)

Department of Aboriginal Affairs if the proposal is in an area of significance to the Aboriginal community

Department of Mineral Resources if a resource management plan applies or if the proposal is in an area of important mineral resources, concerning its responsibilities under Sydney REP No 9 — Extractive Industry, and for safety and blasting

Mining Subsidence Board if the proposal is in an underground mining area

State Rail Authority (SRA) if the proposal impacts on SRA operations

Office of Marine Safety and Port Strategy on any activities on navigable waters

Roads and Traffic Authority if the proposal is likely to result in significant traffic impacts

State Forests of NSW in relation to impacts on State Forests

Department of Bushfire Services if the area is in a location of bushfire hazard

Catchment Management Committees or Trusts

Local Aboriginal Land Councils

relevant industry organisations

Commonwealth EPA, if Commonwealth land is likely to be affected or if Commonwealth funding applies

the owner or operator of any nearby airports and airport safety organisations.

Appendix 5. References

The following are some references that may be of assistance to those preparing EISs. This list is by no means exhaustive.

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Social Policy Directorate (1995) *Techniques for Effective Social Impact Assessment: A practical guide*

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Appendix 6. Schedule 3 — Designated development

This appendix is an extract from Schedule 3 of the EP&A Regulation 1994 and prescribes extractive industries which are designated under Part 4 of the EP&A Act. This designation only applies to proposals which require development consent under the provisions of a planning instrument.

Extractive industries that obtain extractive materials by methods including excavating, dredging, tunnelling or quarrying or that store, stockpile or process extractive materials by methods including washing, crushing, sawing or separating and:

1) obtain or process for sale, or reuse, more than 30,000 cubic metres of extractive material per annum; or
2) disturb or will disturb a total surface area of more than 2 hectares of land by:
   a) clearing or excavating; or
   b) constructing dams, ponds, drains, roads or conveyors; or
   c) storing or deposition overburden, extractive material or tailings; or
3) are located:
   a) in or within 40 metres of a natural waterbody, wetlands or an environmentally sensitive area; or
   b) within 200 metres of a coastline; or
   c) in an area of:
      i) contaminated soil; or
      ii) acid sulphate soil; or
   d) on land that slopes at more than 18 degrees to the horizontal; or
   e) if involving blasting, within:
      i) 1,000 metres of a residential zone; or
      ii) 500 metres of a dwelling not associated with the development; or
   f) within 500 metres of the site of another extractive industry that has operated during the last 5 years.

This designation of extractive industries does not include:

a) extractive industries on land to which the following environmental planning instruments apply:
   i) Sydney Regional Environmental Plan No. 11 — Penrith Lakes Scheme;
   ii) Western Division Regional Environmental Plan No. 1 — Extractive Industries; or
b) maintenance dredging involving the removal of less than 1,000 cubic metres of alluvial material from oyster leases, sediment ponds or dams, artificial wetlands or deltas formed at stormwater outlets, drains or the junction of creeks with rivers provided that:
   i) the extracted material does not include contaminated soil or acid sulphate soil; or
   ii) any dredging operations do not remove any seagrass or native vegetation; or
   iii) there has been no other dredging within 500 metres during the past 5 years; or
c) extractive industries undertaken in accordance with a plan of management (such as river, estuary, land or water management plans) provided that:
   i) the plan is:
      • prepared in accordance with guidelines approved by the Director of Planning and includes consideration of cumulative impacts, bank and channel stability, flooding, ecology and hydrology of the area to which the plan applies; and
      • approved by a public authority and adopted by the consent authority; and
      • reviewed every 5 years; and
   ii) less than 1,000 cubic metres of extractive material is removed from any potential extraction site that is specifically described in the plan; or
d) continued operations within the meaning of State Environmental Planning Policy No. 37 — Continued Mines and Extractive Industries in respect of which an application for development consent has been made before the end of the moratorium period prescribed under that Policy; or
e) the excavation of contaminated soil for treatment at another site; or
f) artificial waterbodies, contaminated soil treatment works, turf farms, or waste management facilities or works, specifically listed elsewhere in this Schedule.

Are alterations or additions designated development?

Is there a significant increase in the environmental impacts of the total development?

1. Development involving alterations or additions to development (whether existing or approved) is not designated development if, in the opinion of the consent authority, the alterations or additions do not significantly increase the environmental impacts of the total development (that is the development together with the additions or alterations) compared with the existing or approved development.

Factors to be taken into consideration:

2. In forming its opinion, a consent authority is to consider:
   a) the impact of the existing development having regard to factors including:
      i) previous environmental management performance, including compliance with:
         - conditions of any consents, licences, leases or authorisations by a public authority; and
         - any relevant codes of practice; and
      ii) rehabilitation or restoration of any disturbed land; and
      iii) the number and nature of all past changes and their cumulative effects; and
   b) the likely impact of the proposed alterations or additions having regard to factors including:
      i) the scale, character or nature of the proposal in relation to the development; and
      ii) the existing vegetation, air, noise and water quality, scenic character and special features of the land on which the development is or is to be carried out and the surrounding locality; and
      iii) the degree to which the potential environmental impacts can be predicted with adequate certainty; and
      iv) the capacity of the receiving environment to accommodate changes in environmental impacts; and
   c) any proposal:
      i) to mitigate the environmental impacts and manage any residual risk; and
      ii) to facilitate compliance with relevant standards, codes of practice or guidelines published by the Department of [Urban Affairs and] Planning or other public authorities.