Statutory guideline

Environmental Protection Act 1994

Estimated rehabilitation cost under the *Environmental Protection Act 1994*

Table of Contents

1. Introduction ... 3
1.1. Estimated rehabilitation cost ... 3
1.2. The purpose of this guideline ... 3
1.3. Governing legislation and policy ... 3
1.3.1. Requirement for an ERC decision to be in effect ... 3
1.3.2. Setting the amount of ERC ... 4
2. Deciding the amount of the ERC ... 5
2.1. Application stage ... 5
2.1.1. How to apply for an ERC decision ... 5
2.2. Information requirements ... 5
2.2.1. General information requirements ... 5
2.2.2. Other information ... 6
2.2.3. Meeting the information requirements ... 6
2.3. Calculating the ERC ... 7
2.3.1. Eligible mining activities ... 7
2.3.2. Approved calculation methodology ... 7
2.4. Information stage ... 9
2.5. Changing Applications ... 10
2.6. Decision stage ... 10
2.6.1. Criteria for deciding the amount of estimated rehabilitation cost ... 10
2.6.2. Decision timeframe ... 11
2.7. Post decision stage—notification ... 11
3. Requirement to re-apply for a new ERC decision ... 11
3.1. Expiry of ERC decision ... 11
3.2. Administering authority may direct EA holder to re-apply for ERC decision ... 12
3.3. EA holder must re-apply for ERC decision ... 12
3.4. Application made but not decided before ERC period ends ... 12
3.5. Amalgamation of environmental authorities ... 12
3.6. De-amalgamation of environmental authorities ... 13
4. Transitional provisions for existing EA holders ... 13
4.1. Transitional scenarios ... 13
4.1.1. EA with FA condition and an FA decision is in force on commencement (no FA application process under way) 13
4.1.2. EA with FA condition, and a relevant FA related process is under way on commencement ... 14
4.1.3. EA with no FA condition ... 14
5. Glossary ... 15
6. Further information ... 17
Appendix A ... 18
Appendix B ... 21
Appendix C ... 24

Version history

Version	Date	Description
1.00	01 April 2019	First version of this guideline following amendments to the *Environmental Protection Act 1994*, after the passing of the *Mineral and Energy Resources (Financial Provisioning) Act 2018.*
1.01	21 June 2019	Approval date added. Headers and footers amended to align with departmental templates.
2.00	01 November 2019	Updates to support the remake of the *Environmental Protection Regulation 2019.*
3.00	17 March 2021	Updates to reflect amendments to the de-amalgamation and ERC provisions, after the passing of the *Environmental Protection and Other Legislation Amendment Act 2020*.
4.00	4 August 2021	Minor updates to refer to the new form for third party quotes that can be attached to an application for ERC decision.
5.00	01 October 2022	Guideline updated as part of the ERC major review project. General principles section and new appendices B and C added. Additional minor updates and corrections made.
6.00	04 April 2023	Updates to reflect amendments to ERC provisions after the passing of the *Environmental Protection and Other Legislation Amendment Act 2023*.
6.01	16 September 2024	Document rebranded to align with machinery of government changes. Hyperlinks included.
6.02	11 August 2026	Updates due to Machinery of Government changes, being change to department name, contact details & corporate branding. Updated reference to Environmental Protection Regulation 2008 with Environmental Protection Regulation 2019. No changes to guideline requirements.

Prepared by: Queensland Government's administering authority of the *Environmental Protection Act 1994* (the department).

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The department is committed to respecting, protecting and promoting human rights, and our obligations under the Human Rights Act 2019.

April 2023

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1. Introduction

1.1. Estimated rehabilitation cost

Estimated rehabilitation cost[1] (ERC) is the estimated cost of:

- rehabilitating the land on which a *resource activity* is carried out and
- preventing or minimising environmental harm, or rehabilitating or restoring the environment, in relation to the resource activity.

The department, as the administering authority of the *Environmental Protection Act 1994* (EP Act), is responsible for deciding the ERC for an *environmental authority* (EA) for resource activities. The *scheme manager* under the *Mineral and Energy Resources (Financial Provisioning) Act 2018* (MERFP Act) will determine the amount of *scheme assurance* that is provided to the Queensland Government by the holder of an EA. The purpose of scheme assurance is to provide the Queensland Government with a source of funds for costs and expenses relating to preventing or minimising environmental harm, or rehabilitating or restoring the environment, or securing compliance with an EA or *small scale mining tenure*[2].

It is a condition of all EAs for resource activities, under section 297 of the EP Act that the holder must not carry out, or allow the carrying out of, an activity under the EA unless an *ERC decision* is in effect, the holder has paid scheme assurance and complied with the requirements under the MERFP Act. Transitional provisions for existing EA holders are outlined in section 4 of this guideline.

1.2. The purpose of this guideline

This guideline is made under section 550 of the EP Act. It outlines the relevant legislative provisions, the approved calculation methodology, application requirements, information request process, changing application process, and decision-making criteria relating to an application for an ERC decision. This guideline is for:

- new operators applying for an ERC decision for the first time
- existing EA holders who are re-applying for an ERC decision
- existing EA holders who have provided *financial assurance* (FA) for an EA under the EP Act prior to the commencement of the ERC provisions—transitional provisions are outlined in section 4 below
- departmental staff administering the ERC provisions under the EP Act
- members of the public interested in learning more about the regulatory framework for ERC.

All references to the ERC in this guideline refer to the EP Act only, unless otherwise stated. Flowcharts appear throughout the document in order to provide more guidance on ERC processes. Unless specified, any reference to a timeframe in the flowcharts is a reference to a timeframe that is set by legislation. This guideline does not deal with *residual risk payments*.

1.3. Governing legislation and policy

1.3.1. Requirement for an ERC decision to be in effect

New EA holders for a resource activity must apply for an ERC decision, have an ERC decision in effect and have lodged scheme assurance (either a contribution paid to the scheme fund or surety given under the MERFP Act) before commencing any activities under their EA. It is a condition of all EAs for a resource activity under section 297 of the EP Act that the holder must not carry out, or allow the carrying out of a resource activity if these requirements have not been complied with. EA holders cannot commence activities under their EA if those activities are not described in the current ERC decision.

Carrying out activities under an EA without first lodging scheme assurance may result in compliance and enforcement action against the EA holder and those acting under the EA. Please refer to sections 297 and 430 of the EP Act.

There are also circumstances throughout the life of the EA when the holder must re-apply for a new ERC decision e.g. before the *ERC period* expires, as directed by the department, or when there is a change in the likely maximum disturbance or a likely increase to the calculated ERC. These scenarios are outlined in section 3 below.

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[1] Throughout this document, italicised words appear in the Glossary at the end of this guideline. Only the first expression of the word will be italicised. Note: some words are italicised because they refer to titles of legislation.

[2] Holders of a *small scale mining tenure* are not required to apply for an ERC decision; however, they are required to provide surety. For small scale mining activities, Schedule 16 of the EP Regulation prescribes the amount of surety required.

1.3.2. Setting the amount of ERC

The EA holder will propose the amount of ERC when they apply for an ERC decision under section 298 of the EP Act. The department must decide the amount of ERC required under section 300 of the EP Act.

The amount of ERC must be based on the potential cost to government of having to undertake rehabilitation activities should the EA holder fail to do so and to prevent or minimise environmental harm, or rehabilitate and restore the environment. For full details of how the proposed ERC amount must be calculated refer to section 2.3.2 of this guideline—Approved calculation methodology.

General principles

The following general principles apply when applying for, and determining, the amount of ERC.

1. An ERC calculation should not be inconsistent with a current approved EA or, for mining activities, a PRCP schedule or, for petroleum and gas activities, a current Plan of Operations. However, further details may be required specific to the ERC period - for example, some EAs may have an approved land outcome but not a rehabilitation plan for how the rehabilitation will be achieved. *Approved documents* do not extend to land outcome documents as defined in section 750 of the EP Act (with the exception of EAs), previous ERC applications or decisions, or EIS documents.
2. Where there is not a previously approved rehabilitation methodology prescribed in an EA or a PRCP schedule that prescribes how disturbance from a resource activity will be rehabilitated, or it is not specified in a Plan of Operations for petroleum and gas activities, the EA holder must adhere to any specific requirements identified in the ERC guideline and should as a minimum use the relevant rehabilitation methodologies provided in the ERC calculators for the relevant rehabilitation requirements.
3. Where there is not a previously approved rehabilitation methodology prescribed in an EA or a PRCP schedule that prescribes how disturbance from a resource activity will be rehabilitated, or it is not specified in a Plan of Operations for petroleum and gas activities and the applicant wishes to propose a rehabilitation methodology other than the requirements specified in the ERC guideline and ERC calculator, the proposed alternative rehabilitation methodology should be supported by evidence. See the relevant appendices for further information.
4. An application for an ERC decision must include a compliance statement that the ERC is consistent with the PRCP schedule or Plan of Operations for petroleum and gas activities to demonstrate that the ERC reflects the approved rehabilitation obligations.

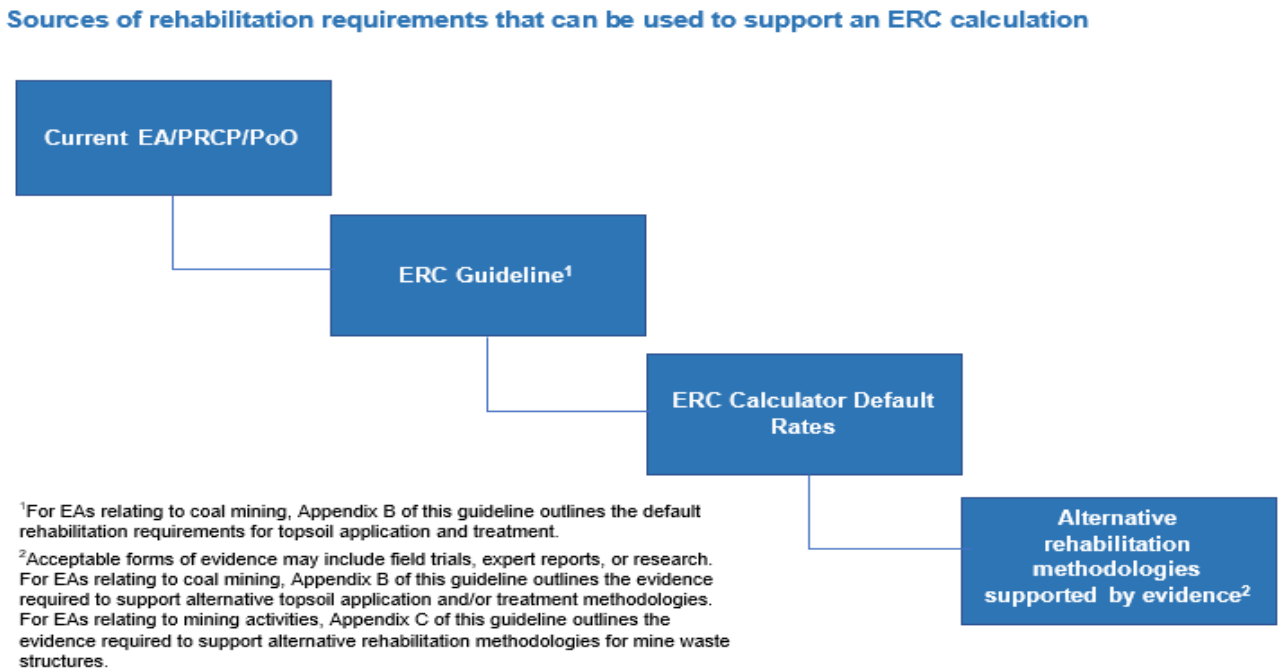


Figure 1: ERC guideline general principles

2. Deciding the amount of the ERC

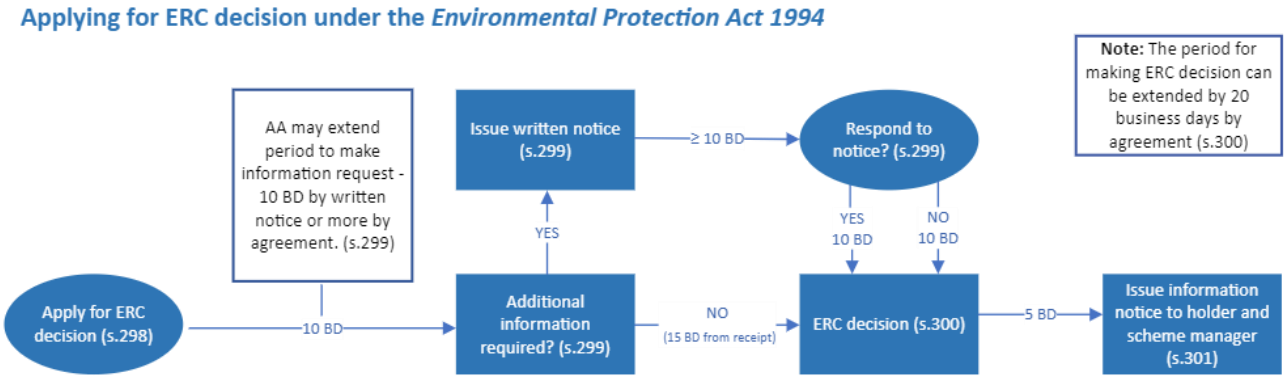


Figure 2: Process for applying for an ERC decision

2.1. Application stage

2.1.1. How to apply for an ERC decision

All holders of EAs for resource activities must apply for an ERC decision using the approved form, Application for a Decision on the Estimated Rehabilitation Cost (ESR/2018/4426)[3]. The application must meet the minimum information requirements set out below. The application can be made at any time after the EA has been granted and can be lodged online via Online Services[4] or a hardcopy form sent to the relevant regional office of the department for the EA.

For mining activities relating to a mining claim, exploration permit or mineral development licence, and which operate under standard conditions, the standard application for a new EA for a resource activity (ESR/2015/1755)[3] does not include an application for an ERC decision. A separate application must be made for an Application for a Decision on the Estimated Rehabilitation Cost (ESR/2018/4426).

2.2. Information requirements

The following information requirements apply to an application for an ERC decision (as per section 298 of the EP Act).

2.2.1. General information requirements

The ERC application must:

(a) State the ERC period to which the application relates. The start date for the ERC period is the day the ERC decision is made by the department.

(b) State the amount the holder considers to be the estimate of the total cost for the ERC period for rehabilitating the land and preventing, or minimising environmental harm, or rehabilitating or restoring the environment in relation to the activity worked out in compliance with the methodology decided by the chief executive and if a PRCP schedule or plan of operations applies, is consistent with the schedule or plan.

(c) Include a compliance statement for the ERC. The compliance statement states that the calculated ERC amount is worked out in compliance with the methodology outlined in this Guideline and, if a PRCP schedule or plan of operations applies for the resource activities—is consistent with the schedule or plan. See section 298(e) of the EP Act. If the EA holder is an individual, the individual must sign the compliance statement. If the EA holder is a corporation, it must be signed by an *Executive Officer* of the corporation. The Executive Officer must provide a letter of authorisation to delegate authority to sign the compliance statement on their behalf.

(d) Include the following (refer to the approved form for detailed requirements for eligible and ineligible ERAs):

(i) a schedule of disturbance[5] (see Appendix 1 of the approved form)

[3] This is the publication number. The publication number can be used as a search term to find the latest version of a publication at www.qld.gov.au.

[4] For further information about Online Services or to register to use Online Services, use 'Online Services (the department)' as a search term at www.qld.gov.au.

[5] Applies to some eligible activities only.

(ii) a list of any published standards, performance indicators or acceptance criteria[6] that underpin the rehabilitation activities and any other assumptions used to calculate the ERC e.g. information in the Global Acid Rock Drainage Guide

(iii) supporting information to show how the proposed ERC has been calculated i.e. the electronic Microsoft Excel worksheets of the ERC calculator or relevant 'Schedule of rehabilitation costs'

(iv) if proposed, detailed third party quotes (including business name and contact details) for alternative rates and for works that are not captured within the ERC calculator. The quote must contain all the information requirements outlined in Appendix A of this guideline to be valid. All third party quotes must be completed using the form 'Third party quotes for estimated rehabilitation cost' (ESR/2021/5691[3]) and must be attached to the approved form. Third party quotes must be valid until the end of the relevant ERC period

(v) map(s) (required for all eligible activities) illustrating the disturbance for the year of maximum liability over the life of the resource project, including the boundaries of the underlying tenure(s)

(vi) shapefiles (required for all ineligible activities) in the format detailed in the guideline 'Spatial Information Submission' (ESR/2018/4337[3]). Shapefiles must illustrate the following site details:

i. existing disturbance area

ii. existing rehabilitation area

iii. proposed disturbance area for the year of maximum liability

iv. proposed rehabilitation area for the year of maximum liability.

2.2.2. Other information

In addition to the above information requirements, ineligible ERAs must provide the following information applicable to the site:

(a) justification for the nominated year of maximum liability

(b) a rehabilitation plan (see Appendix 2 of the approved form)

(c) for mine waste structures (such as waste rock dumps/overburden dumps, tailings dams, heap leach pads) and run of mine areas including[7]:

(i) information about the characterisation of materials, volume and location of material, stability of any structure/s, proposed capping method(s) and rehabilitation strategy, details of any site trials that have been undertaken and how any structure(s) were constructed

(ii) if an alternative cover system is proposed for the rehabilitation of a mine waste structure the information requirements set out in Appendix C

(d) details of water management including but not limited to *site water balance*, dam capacity, dam construction, water quality, treatment of water (particularly acidic and saline)

(e) *material balance* of all material to be mined and/or used in rehabilitation activities on site (e.g. topsoil, capping materials), including[8]:

(i) information about the quantities of available material on site, location of proposed source of material and haul distances; information about whether the material has been tested to ensure that it is suitable for the proposed purpose.

(ii) if an alternative topsoil, amelioration or surface erosion control approach is proposed for projects related to coal mining, the information requirements set out in Appendix B.

2.2.3. Meeting the information requirements

The following information is provided to facilitate the efficiency of the ERC application process and to assist EA holders to meet the information requirements:

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[6] Where performance indicators or acceptance criteria that underpin the rehabilitation activities are contained within a current EA, PRCP or PoO, then a reference to where the relevant performance indicator or acceptance criteria is in the relevant document must be provided.

[7] This information is generally not required for petroleum and gas activities.

[8] This information is generally not required for petroleum and gas activities.

1. The department encourages EA holders to arrange pre-lodgement meetings with the relevant business centre so they are fully apprised of the information that they must provide.
2. To assist in the assessment process, attachments to the approved form should be provided as separate PDF files which are not locked, restricted, or scanned, where possible.
3. The ERC calculator user guide provides detailed supporting information about how to select the appropriate calculator rates to ensure the ERC application is accurate.
4. If any of the other information listed in section 2.2.2 is not applicable to the site, the EA holder must state why it is not applicable e.g. for a petroleum activity without a mine waste structure it should be stated that there are no mine waste structures and the information is not applicable. The EA holder also may re-submit information that has been previously submitted to the department if it is still current, relevant and meets the information requirements in this guideline.

If the EA holder does not comply with all of the relevant requirements in section 298 of the EP Act and sections 2.2.1 and 2.2.2 of this guideline and the approved form requirements, the department may not accept the application. Approved forms must be completed in the specified way, include the specified information or documents that must be attached to or given with the form and verified as required, in order to be a valid application. If the application is not accepted it will be returned without assessment and the EA holder will be required to resubmit a new application for an ERC decision. The department will work with applicants to identify and address the material deficiencies in ERC applications that are not accepted by providing information and feedback. Minor application deficiencies will be addressed through an information request (see information stage below).

More broadly, where the department identifies that ERC applicants are experiencing consistent difficulties with an aspect of the ERC application process, appropriate actions will be taken to improve the process. Actions might include providing more guidance or training material that is appropriate to the customer needs, improving pre-lodgement material to ensure a shared understanding of the ERC assessment process from the outset or reviewing this guideline or the approved form.

2.3. Calculating the ERC

2.3.1. Eligible mining activities

Certain resource activities (mining claims, exploration permits, mineral development licences and mining leases) are authorised with standard conditions if they satisfy the eligibility criteria for the relevant ERA standard (i.e. EAs approved through a standard or variation application). The relevant ERA standards, listed below, are prescribed under the Environmental Protection Regulation 2019 (EP Regulation). For these activities EA holders must use the 'Schedule of rehabilitation costs' found in the appendix of the relevant standard for determining the amount of ERC. For eligible mining lease activities, EA holders have the option of using the 'Schedule of rehabilitation costs' or the ERC calculator to determine the amount of ERC.

The relevant mining standards are:

- Eligibility criteria and standard conditions for exploration and mineral development projects[3])
- Eligibility criteria and standard conditions for mining claims (ESR/2016/2242[3])
- Eligibility criteria and standard conditions for mining lease activities (ESR/2016/2241[3]).

2.3.2. Approved calculation methodology

This is the methodology decided by the Chief Executive under section 298(2)(c) of the EP Act. The ERC must be calculated in compliance with this methodology.

All EA holders must use the most recent version of the department's ERC calculator to calculate their ERC, unless the method or rate to estimate ERC is prescribed in an ERA standard (refer to section 2.3.1 of this guideline).

Where proposing to use any alternatives to the rehabilitation methodologies set out in the ERC calculator, EA holders should also consider the general principles in sections 1.3.2 of this guideline and the relevant appendices.

The calculators can be downloaded from the 'Financial assurance for resource activities' page on the Business Queensland website[9]. EA holders must ensure that they use the latest version of the relevant ERC calculator each time they recalculate their ERC.

[9] To find this webpage, use 'financial assurance for resource activities' as a search term at www.qld.gov.au.

If third party quotes or contracted rates are used to support an ERC calculation they must be included and justified in the appropriate cells designated within the department's ERC calculator. As above, the required supporting evidence for the rate must be provided as part of your ERC application[10].

If alternative rehabilitation methodologies are proposed to the ERC calculator, the applicant must provide supporting evidence for the rehabilitation methodology (see Appendices for further detail).

Criteria for calculating ERC—calculate 100% rehabilitation liability

The total rehabilitation liability reflects the total potential costs for rehabilitating the land and preventing, or minimising environmental harm, or rehabilitating or restoring the environment in relation to the activity to rehabilitate the land on which the resource activity is carried out, to achieve compliance with environmental conditions of the EA, the PRCP schedule (if applicable) and the EP Act. The total rehabilitation liability must:

- be calculated on a project basis as it relates to the EA (i.e. may cover several activities on one or more resource authorities)
- be calculated for the total cost for the ERC period for rehabilitating the land and preventing, or minimising environmental harm, or rehabilitating or restoring the environment in relation to the activity
- be based on the rehabilitation costs for the year in which the maximum liability[11] is incurred within the nominated ERC period
- account for the full extent of work necessary to meet all EA conditions pertaining to rehabilitation and any relevant rehabilitation requirements contained in a related approval, such as the final land use criteria (whether PMLU or NUMA) and any conditions of a PRCP schedule (where applicable).
- include the following activities and costs (contained in the department's ERC calculator):
    (a) *decommission* and remove all *infrastructure* and terminate all services[12]
    (b) constituent tasks or activities required for rehabilitation.
    (c) project management[13] costs (10% of the total rehabilitation liability is recommended)[14]
    (d) maintenance and monitoring[15]. It is recommended that 5% of the total rehabilitation liability be added to account for maintenance and monitoring costs. In some circumstances it may be appropriate to determine actual maintenance and monitoring costs rather than applying 5%. An example is where maintenance and monitoring costs are likely to account for more than 5% of the total rehabilitation liability for the site, for instance where rehabilitation on a site has been substantially completed, but not progressively certified
    (e) include preliminary investigation costs and intrusive investigation costs for the below contamination that are proportionate to the risk:

[10] If there is significant variance between a third party quoted rate and the equivalent departmental calculator rate, or additional information is required to demonstrate that the quote is applicable/sufficient, further information and justification may be required.

[11] If the ERC period is longer than one year, the EA holder must identify the year in that period which will have the maximum liability. The year of maximum liability is the year where at any time if operations were to cease and rehabilitation of all disturbance were to commence, the estimated cost of rehabilitation would be greatest. The calculation of rehabilitation liability must be based on the existing site disturbance, the proposed new disturbance and the rehabilitation planned during the nominated ERC period and accounted for in its entirety, i.e. the total estimated cost of rehabilitating all disturbance to a standard that meets the relevant rehabilitation requirements.

[12] Note: Some costs may not need to be included for certain suitable infrastructure if the EA holder can provide a written agreement (between the EA holder and the land owner) or a statement (if the EA holder is the underlying landowner) that the infrastructure can remain onsite and can demonstrate that the retention of the infrastructure is consistent with achieving the general rehabilitation goals of a site or is part of a post-mining land use if a progressive rehabilitation and closure plan is in effect for the EA, and is safe to humans and wildlife, non-polluting, and stable. Examples of suitable infrastructure include bores, clean water dams and access roads. If the land holder changes, the EA holder should inform the administering authority as soon as practicable after becoming aware of the change to confirm the new land holder agrees with the previous land holder statement. This does not negate the need to obtain any other authorisations as required under the EP Act or other legislation.

[13] This reflects the costs to government to project manage, schedule or oversee the required works.

[14] The EA holder may nominate an alternative amount for these components (or variable amounts across each itemised activity). If the non-recommended value is used, quotes must then be attached with the application/information supplied to the department.

[15] This reflects the cost to government to do ongoing monitoring and maintenance required of rehabilitation works.

- if the project produces one or more hazardous contaminants in a concentration with the potential to cause serious or material environmental harm and a person, animal or other part of the environment may become exposed to the hazardous contaminant(s); or
- includes notifiable activities (as listed in Schedule 3 of the EP Act); or
- has contaminated land on the environmental management register (EMR) or contaminated land register (CLR)

If the default rates do not account for the appropriate investigation costs, the user defined rates should be used. In this instance the intrusive investigation costs should apply proportionate to risk, and in most cases should apply where land is listed on the EMR or CLR unless reasonable justification is provided. User defined rates should also be used for contamination that may have occurred as a result of an incident, spill or ongoing compliance action

(f) estimates determined using the 'high risk rate' in the department's ERC calculator for mine waste structures (such as waste rock/overburden dumps, tailings dams, heap leach pads) that:

- contain Potentially Acid Forming material or
- have observed contaminated seepage that is capable of causing environmental harm[16]

(g) if the project includes a mine waste structure for which a cover system is proposed that is alternative to the appropriate cover system requirements relevant to the risk categorisation of that structure in the ERC calculator or this guideline, comply with the requirements described in Appendix C of this guideline

(h) if the project relates to coal mining and an approved document does not prescribe topsoil, amelioration or surface erosion control requirements, comply with the requirements described in Appendix B of this guideline

(i) an amount of 10% of the total rehabilitation liability for contingency.

The total rehabilitation liability does not:

- need to be calculated for disturbance authorised under an EA if scheme assurance or financial assurance (e.g. prescribed EA carrying out quarrying on a mine site) has already been given under the same or another EA and where there is colocation of infrastructure resulting in no change to the rehabilitation activities or disturbance
- need to include rehabilitated area certified under section 318Z of the EP Act
- include the costs of responding to an incident (e.g. a spill or accidental release to waters that has downstream impacts).

The total rehabilitation liability must not:

- assume that the liability can be reduced or offset by deducting the value of on-site infrastructure or other assets (including scrap metal). This does not satisfy the Queensland Government's requirements for an acceptable form of surety (which must be unconditional; immediately payable on demand and payable without reference to another person and available until all obligations have been performed). The department does not accept this method due to risks and uncertainty associated with the department's ability to inherit and on-sell these assets and commercial factors (i.e. depreciation and saleability) which could affect the value of the item.

2.4. Information stage

The department may request further information necessary to make the ERC decision within 10 business days after receipt of the application by way of written notice to the EA holder. The period in which the department can make an information request can be extended once by written notice by no more than 10 business days and extended again with the approval of the EA holder.

If the required information has been provided in the application but it is not sufficiently detailed, or clear, then an information request may be used. The notice must provide for at least 10 business days for the EA holder to respond. The department may state a response period longer than 10 days depending on the nature of the information being requested and the likely work involved to prepare the information.

There are no provisions for extension of the information response period. Section 299 of the EP Act enables the department to make the ERC decision without the further information if the holder fails to provide the requested information

[16] If you are unsure whether this is applicable to your site, seek advice during a pre-lodgement meeting.

within the required timeframe. The ERC decision must be made within the timeframes stated in section 300 (refer section 2.5.2 for further details).

The information stage should not be used for applications that have not satisfied the requirements of the approved form. These applications may not be accepted (refer to section 2.2.3 of this guideline).

2.5. Changing Applications

Before an ERC decision is made, an applicant may change the application by giving the department written notice of the change. If the change is a minor change, or the administering authority agrees to the change in writing, the change has no impact on the assessment process. If the change is not a minor change, or the administering authority does not agree to the change in writing, the assessment process restarts from the day the notice of the change is given to the department. The changed application is considered a new application for an ERC decision. It is important to note that an applicant cannot change the application if the change would result in section 298 of the EP Act not being complied with for the application. See section 299A-299C of the EP Act for further information about changing applications and for the definition of a minor change.

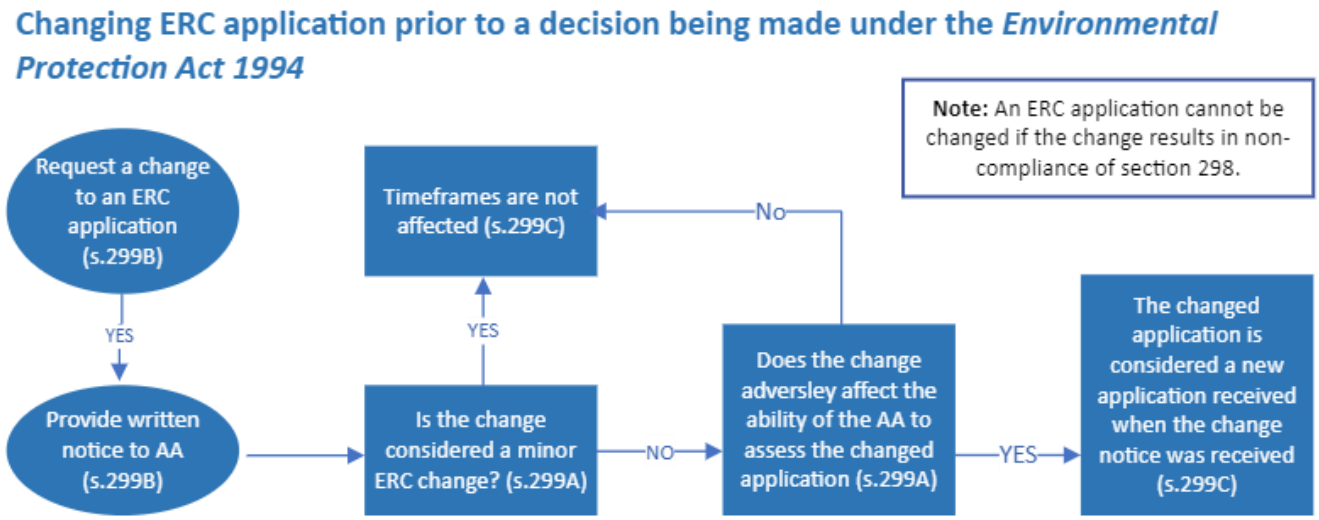


Figure 3: Process for changing an ERC application

2.6. Decision stage

2.6.1. Criteria for deciding the amount of estimated rehabilitation cost

In making the ERC decision, the department must have regard to whether the EA holder's estimate of the total rehabilitation cost has been calculated out for the ERC period in accordance with section 298(2)(c) of the EP Act, and this guideline (made under section 550 of the EP Act). Refer to section 300 of the EP Act.

The following criteria must be considered in making the ERC decision:

- the ERC has been calculated on a project basis
- the ERC has been calculated for all land to which the EA relates, and for the total cost for the ERC period for rehabilitating the land and preventing, or minimising environmental harm, or rehabilitating or restoring the environment in relation to the activity
- the ERC has been calculated on the basis of the rehabilitation costs for the year of maximum liability in the ERC period
- the ERC represents the total potential cost to government of rehabilitation for the year of maximum liability within the ERC period
- any rehabilitation plans for the EA
- any relevant report, evaluation, assessment or statement of compliance for the EA
- relevant standards or rehabilitation requirements such as conditions of the EA
- relevant progressive certification applications and/or decisions for the EA
- relevant enforcement action or notices about rehabilitation or past environmental performance
- supporting information and assumptions used to calculate the ERC

- the submitted compliance statement for the ERC (made under section 298(2)(e) and outlined in 2.2.1(c))
- if applicable, other valid third-party quotes or cost estimates for the work
- if applicable, any compliance statement or declaration given about the EA e.g. a compliance statement given for a plan of operations.

The administering authority may also have regard to any relevant advice, report or guidance published by the rehabilitation commissioner under section 444K of the EP Act when deciding the ERC application.

2.6.2. Decision timeframe

If no further information is requested the department must make the ERC decision within 15 business days of receiving the ERC application. If an information stage is applied the department must make an ERC decision 10 business days after the further information is received or 10 business days after the holder fails to comply with the information notice. In either case, the decision period can be extended to a longer period of not more than an additional 20 business days with the agreement of the EA holder.

However, for an ERC decision that is accompanied by a de-amalgamation application, the ERC decisions for each of the proposed de-amalgamated EAs must all be made at the same time (see section 300(4)).

2.7. Post decision stage—notification

The department must notify the EA holder and the scheme manager, via an information notice, about the ERC amount and the period for which the ERC decision is in force within 5 business days of making the decision. Refer to section 301 of the EP Act. The notice will also include details on the review and appeal options available to the EA holder (refer to Schedule 2 Original decisions under the EP Act).

3. Requirement to re-apply for a new ERC decision

In certain circumstances there may be a requirement for the EA holder to re-apply for an ERC decision. The required timing of the application is outlined in sections 302 – 304 of the EP Act.

Provided that scheme assurance is already held by the scheme manager, the operator will not need to 'stop' operations while an application for a new ERC decision is made under section 298 of the EP Act. However, no additional disturbance can be undertaken, beyond the maximum liability associated with the scheme assurance currently held, until the new ERC application is decided, and any outstanding additional scheme assurance is given. Where the application is made in compliance with the EP Act, the current ERC decision continues to have effect until the new ERC decision is made (refer to section 305 of the EP Act). The requirements for re-applying are outlined below.

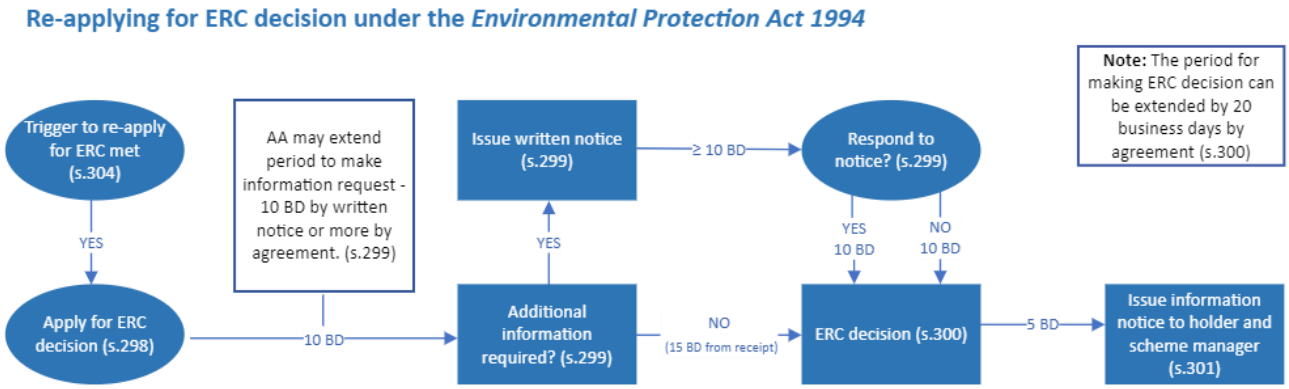


Figure 4: Process to re-apply for a new ERC decision

3.1. Expiry of ERC decision

All EA holders must apply for a new ERC decision before expiry of the ERC period prescribed in the current decision (refer to section 302).

For an EA for a petroleum activity to which a plan of operations applies, an application for a new ERC decision must be made:

- when the new plan of operations is submitted for the EA, if the plan of operations is submitted at least 20 business days before the current plan ends; or
- at least 20 business days before the current ERC decision ends, if the plan of operations will be submitted less than 20 business days before the current plan ends.

For all other EAs, the holder must re-apply for an ERC decision at least three months before the ERC period ends.

Failure to comply with this requirement may result in enforcement action where penalties may apply.

A new ERC decision can be applied for under section 298 at any time, as long as the application complies with the timeframes mentioned above.

3.2. Administering authority may direct EA holder to re-apply for ERC decision

In some circumstances the department may direct an EA holder via a notice to re-apply for an ERC decision. This may occur when the department:

- becomes aware of a change relating to the carrying out of a resource activity by a holder of an EA that may result in an increase in the ERC for the activity, or
- approves an application to amalgamate an EA with another EA under section 247 of the EP Act, or
- becomes aware that an ERC decision was made on the basis of materially incorrect or misleading information.

The department may issue a notice directing the EA holder(s) to re-apply for an ERC decision. The notice will state a period in which the holder(s) must comply with the direction. A maximum penalty of 100 penalty units may apply for non-compliance with these requirements.

3.3. EA holder must re-apply for ERC decision

Under section 304 of the EP Act, an EA holder for a resource authority must re-apply for an ERC decision under the following circumstances and within the timeframes specified below:

Table 1: Circumstances requiring the EA holder to re-apply for an ERC decision

Circumstances requiring the EA holder to re-apply for an ERC decision	Timeframe
There is an increase in the likely maximum amount of disturbance to the environment as a result of the holder carrying out the resource activity	Within 10 business days of the holder becoming aware of the increase
There is a change relating to the carrying out of the resource activity that may result in an increase in the ERC for the activity	Within 10 business days of the holder becoming aware of the change
The holder's annual return states there has been a change to the carrying out of the activity that may affect the ERC	Within 10 business days of the holder giving the annual return to the department
The department approves an application to amalgamate the EA under section 247 of the EP Act	Within 10 business days after the department amalgamates the EAs

Failure to comply with this requirement can attract a maximum penalty of 100 penalty units.

3.4. Application made but not decided before ERC period ends

If a current ERC decision is in force and an application for a new ERC decision is made under section 298 of the EP Act but has not been decided before the ERC period for the current decision ends, the current decision remains in force until the day the application for the new ERC decision is decided. The ERC period for the current decision ends on the day when the new ERC decision is made.

However, no additional disturbance can be undertaken, beyond the maximum liability associated with the current ERC decision, until the new ERC application is decided, and any outstanding additional scheme assurance is given.

3.5. Amalgamation of environmental authorities

Where an EA has been **amalgamated**, the existing ERC decision (the previous ERC decision) is no longer in force on the day the amalgamation application is approved. The department is taken to have made a new ERC decision under section 300 of the EP Act for the amalgamated EA (deemed ERC decision), which is taken to be the combined total of the estimated rehabilitation costs for the amalgamated EAs under the previous ERC decisions.

This arrangement is necessary to ensure that where an EA is amalgamated the holder(s) is not in contravention of the condition in section 297 of the EP Act which prohibits EA holders from carrying out an activity unless an ERC decision is in effect, and the holder has paid a contribution or given a surety under the MERFP Act 2018.

After an amalgamation, the new EA holder(s) must apply for a new ERC decision within 10 business days otherwise penalties may apply.

3.6. De-amalgamation of environmental authorities

If an ERC decision is, or has been, in effect for an EA, an application for the de-amalgamation of that EA must be accompanied by an ERC application under section 298 for **each proposed** de-amalgamated authority (section 250B). This ensures that the ERC accurately reflects the rehabilitation liability immediately following the de-amalgamation.

For a de-amalgamation relating to a tenure transfer, the de-amalgamation will not take effect until the proposed holder of each de-amalgamated EA has paid a contribution to the scheme fund or provided a surety to the Scheme Manager for the EA and the tenure has been transferred (section 250D).

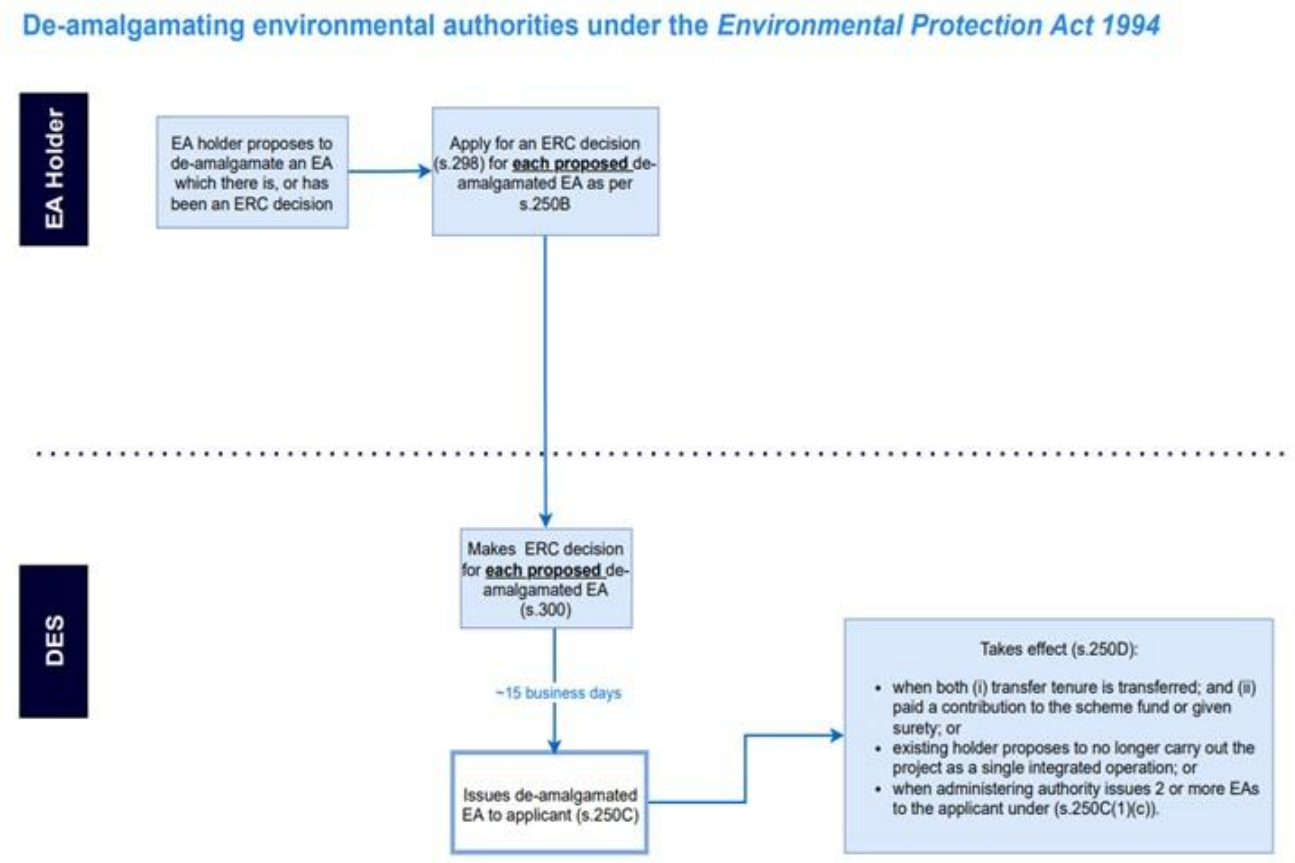


Figure 5: Process for de-amalgamation of EA with an ERC decision

4. Transitional provisions for existing EA holders

Following commencement of the new financial provisioning scheme, all existing EA holders will be deemed to have an ERC decision.

4.1. Transitional scenarios

The operation of the transitional provisions will depend on whether an EA has pre-existing FA conditions and whether an FA decision has been made prior to commencement.

4.1.1. EA with FA condition and an FA decision is in force on commencement (no FA application process under way)

On commencement all EA holders who have an FA decision in force and no FA application process under way will be deemed to have an ERC decision. The amount of FA decided for the EA is deemed to be the ERC amount. ERC periods are as follows:

- For an EA for a resource activity relating to a mining lease the ERC period will start on commencement and continue until such time as the current plan of operations for the EA expires[17].
- If the resource activity relates to a petroleum activity for an ineligible ERA or a 1923 Act petroleum tenure granted under the *Petroleum Act 1923*, the ERC period will expire on the earlier of the day the holder's plan of operations ends or the day that is 3 years after commencement.
- For all other EAs the day all resource activities carried out under the EA have ended.

4.1.2. EA with FA condition, and a relevant FA related process is under way on commencement

The FA process in the pre-amended EP Act will continue to apply, if on commencement, an EA includes an FA condition and the following processes under the EP Act are in progress:

- a decision about the amount and form of FA
- claiming on or realising FA
- amending or discharging FA.

Note: EA holders with an FA condition in their EA who on commencement have not applied for FA will be subject to the amended Act and are required to apply for an ERC decision prior to carrying out activities under the EA.

4.1.3. EA with no FA condition

If an EA for a resource activity does not contain a condition requiring the provision of FA prior to commencement, the ERC is either taken to be the existing amount of FA held for that EA, or where no FA has been paid, the ERC will be deemed to be nil.

The ERC period for this ERC decision is taken to be three years from commencement.

[17] However, if a notice given under section 301 states that the ERC period for the ERC decision ends on a day later then the expiration of the Plan of Operations, the ERC period ends on the day stated in the notice.

5. Glossary

Appropriately qualified person	Means a person who has professional qualifications, training, skills and/or experience relevant to the provision of a contracted rate or third party rate.
Approved documents	Means an approved and current EA or PRCP schedule. Approved documents do not extend to land outcome documents (section 750 of the EP Act) precious ERC applications or decisions or EIS documents.
Contracted rates	Contracted rates provided by the EA holder must be from a service provider who is a separate legal entity to the EA holder, and who is appropriately qualified person to safely and competently do the works. They must be from a formal written contract awarded and executed in the previous 12-month period from the date of the ERC application and must be for the site the ERC application relates to. Contracted rates must contain the information mentioned in Appendix A for third party quotes to be valid, including being valid until the end of the relevant ERC period.
Current Decision	Defined in section 305 of the Environmental Protection Act 1994.
Decommission	To close down (a facility, as a power station, sewerage plant, etc.).
Estimated rehabilitation cost (ERC)	Defined under section 300 of the *Environmental Protection Act 1994*.
ERC decision	Defined in section 296 of the *Environmental Protection Act 1994.*
ERC period	Defined in section 296 of the *Environmental Protection Act 1994.*
Eligible ERA	An environmentally relevant activity that complies with the eligibility criteria in effect for the activity.
Environmentally relevant activity (ERA)	Defined in section 18 of the *Environmental Protection Act 1994.*
Executive officer	Defined in Schedule 4 of the *Environmental Protection Act 1994.*
Financial assurance (FA)	Financial assurance given for an environmental authority for a resource activity under chapter 5, part 12, division 2 of the *Environmental Protection Act 1994*, prior to the commencement of the *Mineral and Energy Resources (Financial Provisioning) Act 2018*.
Ineligible ERA	An environmentally relevant activity that is not an eligible ERA.
Infrastructure	Includes built facilities and services associated with the operations of the authorised activities (e.g. processing plants, sewage treatment plants, power plants, camps, offices, power poles, sheds, workshops and other built structures, pipes, field pumps, water and power infrastructure).
Material balance	Refers to an inventory of the volume (in cubic metres) of all material to be mined and/or used in rehabilitation activities on site (regardless of whether it has or has not yet been extracted). The material balance must take into consideration the physical, mineralogical and chemical characteristics of the material and, for material that is to be used in rehabilitation, the suitability for the intended use.
Online Services	The department's digital platform for online services and transactions. For further information about Online Services or to register to use Online Services, use 'Online Services (the department)' as a search term at www.qld.gov.au.
Plan of Operations	Refer to chapter 5, part 13, division 1 of the *Environmental Protection Act 1994* for petroleum leases.
Progressive certification	Progressive certification occurs when the department certifies that a particular area has been rehabilitated under all relevant requirements of the *Environmental Protection Act 1994* and the environmental authority.
Progressive rehabilitation and	PRC plan, for land the subject of a mining lease, means a progressive rehabilitation and closure plan for the land that consists of—

closure plan (PRC plan)	(a) the rehabilitation planning part of the plan, and (b) the PRCP schedule for the plan, including any conditions imposed on the schedule.
PRCP schedule	A schedule of the PRC plan that- (a) complies with section 126D of the EP Act; and (b) is approved under chapter 5, part 5, division 2 of the EP Act, with or without conditions.
Residual risk payment	A requirement made under the *Environmental Protection Act 1994* for the payment of funds to cover the residual risk of environmental harm occurring after an environmental authority for a resource activity has been surrendered or when a site management plan for contaminated land has been recorded on the contaminated land register.
Resource activities	Defined in Section 107 of the *Environmental Protection Act 1994*.
Scheme assurance	Means a contribution paid to the scheme fund or a surety given under the *Mineral and Energy Resources (Financial Provisioning) Act 2018*.
Scheme Manager	Defined in Schedule 1 of the *Mineral and Energy Resources (Financial Provisioning) Act 2018.*
Site water balance	Refers to an accounting of the inflow to, outflow from, and storage changes of water on site over the ERC period.
Small scale mining tenure	Defined in section 21A(2) of the *Environmental Protection Act 1994*.
Standard, variation or site-specific applications	A standard application for an environmental authority is one that can comply with the eligibility criteria that are prescribed under the Environmental Protection Regulation 2019 and the standard conditions as notified in the gazette (eligible ERA). A variation application is one which can comply with the eligibility criteria but not all standard conditions. If the eligibility criteria can't be complied with, an application must be site-specific (ineligible ERA). Refer to sections 121-124 of the *Environmental Protection Act 1994.*
Third party quote	A third-party quote must be prepared by a service provider who is a separate legal entity to the EA holder and who is an *appropriately qualified person* to safely and competently do the works or estimate the cost of the works.

6. Further information

Contact your project manager for further advice or for general enquiries, please contact Permit and Licence Management. Information is also available on the 'Financial assurance for resource activities' page on the Business Queensland website[18].

Approved

04 April 2023

Enquiries:

Permits and Licensing
Phone: 1300 130 372
Email: palm@detsi.qld.gov.au
Website: www.detsi.qld.gov.au

[18] To find this webpage, use 'financial assurance for resource activities' as a search term at www.qld.gov.au.

Appendix A

Third-part quotes checklist and proforma[19]

Third-Party Quotes

This document sets out the information requirements that must be met when obtaining third-party quotes in relation to estimated rehabilitation cost calculations. *It may be provided to any potential service providers to assist in the preparation of a valid quote.* Third-party quotes that do not meet these information requirements may be subject to an information request, see section 2.4. The application may also be subject to an information request where the administering authority requires more information to demonstrate that the third-party quote is applicable/sufficient.

Note: Quotes that do not meet these requirements may be replaced with the appropriate departmental calculator rate.

Minimum information to be specified within the quote

1 Business details of supplier

NAME OF SUPPLIER	
FULL NAME OF INDIVIDUAL OR OIGANISATION NAME	

ABN / ACN	
ABN / ACN	

CONTACT PERSON	
FULL NAME	
POSITION TITLE	

ADDRESS AND CONTACT DETAILS	
POSTAL ADDRESS:	
PHONE	FAX
MOBILE	EMAIL

Refer to item 8 below to see how the quote expiry will be further considered in representing a true cost to government.

2 A quote expiry date

EXPIRY DATE

ERC held by the State must exclude GST.

3 Price to be shown excluding GST

QUOTE TOTAL EXCLUDING GST

Provide a brief statement outlining how the service

The supplier must meet the following requirements

[19] A word version of this form that can be filled in by suppliers is available at www.qld.gov.au using the publication number ESR/2021/5691 as a search term.

provider meets these requirements.

4 Be a separate legal entity to the EA holder

DETAILS SHOWING SUPPLIER IS A SEPARATE LEGAL ENTITY TO EA HOLDER

5 Be an *appropriately qualified person*

Provide details of relevant qualifications, training, skills, or experience such as licenses granted in accordance with relevant legislation, statements of attainment of a nationally recognised unit of competency i.e. a demolition work license. General construction induction card competency or Statement of attainment OHSCER216A Operate a scraper or OHSCER217A Operate a grader; or current relevant experience that could be verified by logbooks, or previous employment or references.

DETAILS SHOWING SUPPLIER IS A SEPARATE LEGAL ENTITY TO EA HOLDER

The quote must reflect the true cost to government to commission the works

6 Assume that personnel, facilities, plant or equipment unique to the EA holder will not be available to the service provider

☐ The quote is based on none of the EA holder's personnel, facilities, plant or equipment being available for use.

7 Be exclusive of discounts, rebates and/or subsidies

☐ No discounts, rebates or subsidies have been applied in developing this quote.

A quote is valid until its expiry date.

8 Quotes must be valid for the relevant ERC period.

☐ This quote is valid until the end of the relevant ERC period, which I have been advised is Insert date.

The quote must include a detailed breakdown of the works involved

An activity is something that can be completed in a matter of days e.g. 7 days. Activities may include simple earthmoving works, demolition and removal of small buildings and/or demountable structures.

For an activity

9 A breakdown of the works, including but not limited to:

- a description of the proposed works
- the time (in hours) expected to complete each activity
- a list of machinery to be used/hired to complete each activity
- a schedule of rates that clearly itemises the costs (where relevant to the activity/ies to be undertaken) of:
  - machinery to be used/hired, including specification of whether cost is based on wet or dry hire
  - mobilisation and demobilisation
  - labour
  - fuel
  - source, cart and placement of materials (including haulage distance);
  - consumables
  - accommodation
  - transport
  - disposal fees
- a description of any assumptions relied upon
- a description of any costs that have been excluded.

BREAKDOWN OF WORKS FOR PROJECT

A project is something that requires significant effort in terms of planning and implementation (weeks to months), and typically requires the involvement of many people. Some examples of projects include capping of a Waste Rock Dump or Tailings Storage Facility; demolition and removal of all site infrastructure; on-site treatment of contaminated water.

For a project

10 A breakdown of the works, including but not limited to:

- the technical specifications relevant to the project to be undertaken, including for example:
  - design report(s)
  - geotechnical report(s)
  - material description and material balance
- for construction, an itemised inventory of what is to be removed
- a scope of work, including:
  - project overview
  - project deliverables
  - project schedule including timeframes for quoted components
- contractor's statement of capability to undertake the proposed project;
- a schedule of rates that clearly itemises the costs (where relevant to the activity/ies to be undertaken) of:
  - machinery to be used/hired, including specification of whether cost is based on wet or dry hire
  - mobilisation and demobilisation
  - labour
  - fuel
  - preparation of materials
  - source, cart and placement of materials
  - engineering QA/QC costs
  - consumables
  - accommodation
  - transport
  - disposal fees
  - certification that works have been undertaken in accordance with technical specifications
- a description of any assumptions relied upon
- a description of any costs that have been excluded.

BREAKDOWN OF WORKS FOR PROJECT

Declaration

I do solemnly and sincerely declare that the information provided is true and correct to the best of my knowledge.

I understand that all information supplied on or with this application form may be disclosed publicly in accordance with the *Right to Information Act 2009* and the *Evidence Act 1977*.

FULL NAME OF PERSON GIVING QUOTE	POSITION OF PERSON GIVING QUOTE
SIGNATURE OF PERSON GIVING QUOTE	DATE

Appendix B

Topsoil rehabilitation requirements for coal mines in Queensland and proposing alternative application rates

Introduction

The department's ERC guideline and calculator prescribes application rates and costs relevant to topsoil to determine the ERC. The EA holder should consider the general principles outlined in sections 1.3.2 and comply with the requirements of this appendix.

Expectations for topsoil treatments in ERC calculations

The department's expectations for ERC provisions for topsoil amelioration; establishing a suitable plant growth medium for sites with a topsoil deficit; treatment of saline and sodic spoils; and surface erosion control treatments, are detailed below and are based on the best current knowledge from relevant literature.

These treatments and costings may be included by the department in the ERC decision where the EA holder does not have a previously approved EA or PRCP schedule which include topsoil treatment requirements or does not or cannot provide evidence[20] to demonstrate the adequacy of alternative application rates, treatments or treatment rates.

The prescribed default topsoil, amelioration and surface erosion control requirements are based on the most achievable and likely post-mining land use for the landform type. However alternative post-mining land uses may require different topsoil, amelioration or surface erosion control methodologies and alternative proposals should be supported by site specific soil and spoil quality and the requirements of the proposed post-mining land use. As described in section 1.3.2 General Principles and reflected below, current approved outcomes in an EA or PRCP schedule are not subject to the prescribed defaults.

The unit costs have been included as per the ERC calculator, however third-party quotes for alternative unit prices can be provided.

Topsoil depth

This section relates to the application and treatment using the existing topsoil inventory on mine sites. The assumptions made relate to the inventory of topsoil that would be available on site during the year of maximum liability within the proposed ERC period. The ERC calculation must include:

- Where there is a current approved EA or PRCP schedule, which prescribes a minimum topsoil depth—the cost of spreading topsoil at this minimum depth using the ERC calculator; or
- Where there is **not** a previously approved EA or an approved PRCP schedule, which prescribes a minimum topsoil depth—the cost of spreading topsoil at a minimum depth of 150mm[21] as per the ERC calculator default depth, or at a greater depth if the existing topsoil inventory allows; or
- Where there is **not** a previously approved EA or a PRCP schedule, which prescribes a minimum topsoil depth but the application is accompanied by evidence that a depth of topsoil less than 150mm enables successful revegetation of the site in accordance with the post-mining land use—the cost of spreading topsoil at the depth supported by evidence.

[20] For the purposes of this appendix, evidence may include, but is not limited to (in no particular order):
- Completed site specific studies such as soils assessments undertaken as part of project applications (EIS's or EA applications etc) or other specific soils/ecology/rehabilitation studies, etc; or
- Monitoring results for previously completed rehabilitation undertaken as per the proposed rehabilitation methodology, which demonstrates achievement of the post-mining land uses; or
- Results of field trials undertaken at the site or at a site with similar characteristics (spoil, topsoil, vegetation, climate) with the proposed rehabilitation methodology and topsoil depth as developed by an appropriately qualified person; or
- Appropriate research developed for the mining industry and in areas with similar characteristics (spoil, topsoil, vegetation, and climate).

[21] This prescribed default application rate is based on a post-mining land use of **grazing**, however alternative post-mining land uses may require different application rates and proposals should be supported by site specific soil and spoil quality and the requirements of the proposed post-mining land use.

Ameliorants[22]

This section relates to the application and treatment using the existing topsoil inventory on mine sites. The ERC calculation must include:

- Where there is a current approved EA or PRCP schedule, which prescribes amelioration and fertilisation requirements—the cost of ameliorating and fertilising the existing topsoil as per the previously approved requirements using the ERC calculator; or
- Where there is **not** previously approved EA or an approved PRCP schedule, which prescribes amelioration and fertilisation requirements—the cost of ameliorating and fertilising the existing topsoil at the following application rates:
    - Gypsum—2.5t/ha[21]. TOV #14.32, with an appropriate multiplier where information on the dispersivity of the soils is available, aligning with **Dale et al. (2018)**[23];and
    - Fertilizer—0.2-0.25t/ha[21]. TOV #14.39; or
- Where there is **not** previously approved EA or an approved PRCP schedule, which prescribes amelioration/fertilisation requirements, but the application is accompanied by evidence that amelioration/fertilisation is not necessary or a varied application rate can be applied—the cost of ameliorating and fertilising the existing topsoil at the rate supported by evidence.

Manufacturing a plant growth medium

Where there is insufficient topsoil to be spread at the depth prescribed in a previously approved EA or PRCP schedule, at a default depth of 150mm, or at the depth supported by evidence (known as a topsoil deficit), a benign subsoil horizon followed by application of amelioration, fertiliser and mulch to create a suitable plant growth medium should be established on spoil. Therefore, the ERC calculation must include:

- Where there is a current approved EA or PRCP schedule, which prescribes a methodology for the manufacture of a growth medium to address topsoil deficiency—the cost of manufacturing a growth medium as per that methodology using the ERC calculator; or
- Where there is **not** a previously approved EA or PRCP schedule, which prescribes a methodology for the manufacture of a growth medium to address topsoil deficiency—the cost of manufacturing a growth medium by combining the following materials at the following rates:
    - Gypsum—20t/ha[24]. Using the cost/t from TOV #14.32 the cost/ha for Gypsum is $2774.96/ha.
    - Fertiliser—0.6t/ha[24]. Using the cost/t from TOV #14.39 the cost/ha is $810.98/ha. This increased application rate of fertiliser will ensure the availability of nitrogen over any short- or medium-term immobilisation[25, 26].
    - Organic matter[27] (e.g. hay, sugar cane leaves & tops etc.)—15t/ha[24]. A unit cost of $250/t will be applied unless or until such time as, the EA holder can provide a third party quote for an alternative cost; or

[22] The ERC calculator does not specify topsoil ameliorants; however, provides an option for ameliorants to be nominated by the user (by area) or set to zero if ameliorant is identified by the user to not be required. The application of ameliorant costs must be supported by additional information, as costings may be dependent on a number of assumed factors such as growth media (soil) attributes and suitability, rehabilitation objectives and intended post mining land use. In accordance with section 2.2.2 (e) of the ERC guideline requirements applications associated with ineligible ERAs are required to provide information that includes: material balance, including quantities of available material on site, location of proposed source of material and haul distances; information about whether the material has been tested to ensure that it is suitable for the proposed purpose.

[23] Dale, G., Thomas, E., McCallum, L., Raine, S., Bennett, J. & Reardon-Smith, K. (2018). Applying risk-based principles of dispersive mine spoil behaviour to facilitate development of cost-effective best management practices. ACARP Project Number C24033, Australian Coal Research Limited, Brisbane.

[24] This prescribed default application rate is based on a post-mining land use of grazing, however alternative post-mining land uses may require different application rates and proposals should be supported by site specific soil and spoil quality and the requirements of the proposed post-mining land use.

[25] Kneller, T., Bateman, A., Harris, R., & Muñoz-Rojas, M. (2018a). The combination of restoration strategies to overcome topsoil deficit and enhance quality of reconstructed soils in semi-arid lands. EGUGA, 11035.

[26] Kneller, T., Harris, R. J., Bateman, A., & Muñoz-Rojas, M. (2018b). Native-plant amendments and topsoil addition enhance soil function in post-mining arid grasslands. Science of the Total Environment, 621, pp. 744-752.

[27] Organic matter should be included within the Miscellaneous Tab of the ERC calculator.

- Where there is **not** a previously approved EA or PRCP schedule, which prescribes a methodology for the manufacture of a growth medium to address topsoil deficiency but the application is accompanied by evidence that an alternate methodology for the manufacture of a growth medium is suitable—the cost of manufacturing a growth medium as per the methodology supported by evidence.

Surface erosion

The suitability of a post mining land use for a particular area will often be determined by the slope and the spoil and topsoil qualities of the final landform.

It is generally recognised that the rainfall-runoff-soil erosion process is a complex interrelationship between rainfall intensity and duration, slope angle and length, infiltration, overland flow, and soil/substrate characteristics.

Surface erosion of slopes <15%

Where slopes (not flat areas) are <15% the erosion of topsoil (or a suitable plant growth medium) prior to vegetation establishment must be controlled, therefore the ERC calculation must include:

- Where there is a current approved EA or PRCP schedule, which prescribes methods for erosion control of slopes <15%—the cost of those erosion controls using the ERC calculator; or
- Where there is **not** a previously approved EA or PRCP schedule, which prescribes methods for erosion control of slopes <15%—the cost of controlling erosion via the application of organic mulch at an amount of at least 5t/ha of hay or organic material[24]; or
- Where there is **not** a previously approved EA or PRCP schedule, which prescribes methods for erosion control of slopes <15% but the application is accompanied by evidence that alternate erosion controls are suitable—the cost of those alternate erosion controls supported by evidence.

Surface erosion is less likely on flat areas with soils that are non-dispersive and thus where soil quality and slope evidence can be provided, surface erosion control methods may not be necessary.

Surface erosion control of slopes >15%

On steeper slopes appropriate surface erosion control measures must be applied to manage and mitigate the movement of water and sediment that would reduce the erosional stability of the landform and successful establishment of vegetation[28], therefore the ERC calculation must include:

- Where there is a current approved EA or PRCP schedule, which prescribes methods for erosion control of slopes >15%—the cost of those erosion controls using the ERC calculator; or
- Where there is **not** a previously approved EA or PRCP schedule, which prescribes methods for erosion control of slopes >15%—the cost of controlling erosion via the application of rock mulch[29] at the following rate:
    - Application of 0.5m of Rock mulch[30]. A unit cost of $2.48/m^3 will be applied unless or until such time as, the EA holder can provide a third party quote for an alternative cost; or
- Where there is **not** a previously approved EA or PRCP schedule, which prescribes methods for erosion control of slopes >15% but the application is accompanied by evidence that alternate erosion controls are suitable—the cost of those alternate erosion controls supported by evidence.

[28] Drake et al. 2010. A review of landscape rehabilitation frameworks in ecosystem engineering for mine closure.

[29] Ghahramani et al. 2021. A risk-based approach to mine-site rehabilitation: use of Bayesian belief network modelling to manage dispersive soil and spoil. *Sustainability* 13, 11267.

[30] This prescribed default application rate is based on a post-mining land use of native ecosystem, however alternative post-mining land uses may require different application rates and proposals should be supported by site specific soil and spoil quality and the requirements of the proposed post-mining land use.

Appendix C

Mine waste structures rehabilitation requirements and proposing alternative cover systems

Introduction

The department's ERC guideline and calculator prescribes risk categories for mine waste structures and uses rates that correlate with the cover system requirements and costs necessary to determine the ERC. The EA holder should consider the general principles outlined in sections 1.3.2 and comply with the requirements of this appendix if a rehabilitation methodology or unit pricing other than the requirements specified in the ERC guideline and ERC calculator is proposed.

Expectations for mine waste structures in ERC calculations

The department's expectations for each of the identified risk categories of mine waste structures are provided in the Table of Values worksheet of the ERC calculator. The ERC calculation must:

- Where an EA or PRCP schedule prescribes the cover system requirements and **has been** approved by the department and is current—reflect the cost of installing the cover system using the ERC calculator; or
- Where an EA or PRCP schedule that prescribes the cover system requirements **has not** been previously approved by the department—the cost of installing the cover system is calculated as per the prescribed rehabilitation requirements in the ERC guideline and the ERC calculator relevant to the risk category for the mine waste structure; or
- Where an EA or PRCP schedule that prescribes the cover system requirements **has not** been previously approved and the EA holder wishes to propose an alternative to the prescribed rehabilitation requirements in the ERC guideline and the ERC calculator—the costs of an alternative cover system must be supported by the results of a field trial or results of other field trials as outlined below.

Requirements for field trials

Where an EA or PRCP schedule that prescribes the cover system requirements **has not** been previously approved and the EA holder wishes to propose an alternative to the prescribed rehabilitation requirements in the ERC guideline and the ERC calculator, the ERC application must be supported by a completed field trial to demonstrate the construction and performance of the alternative cover system that:

1. has been established for a minimum of 5 consecutive years; or
2. is inclusive of at least a 1 in 10 average recurrence interval (ARI) dry season event and a 1 in 100 ARI wet season event (for which artificial simulation through irrigation may be utilised) or 10 consecutive years of monitoring, whichever occurs sooner.

The field trial may be located on another area of the tenure if the mine waste structures have not yet been constructed. It is strongly recommended that multiple alternate cover systems are trialled, including the default requirements corresponding to the risk of the mine waste structure outlined in the ERC calculator, to ensure that a successful cover system is identifiable at the end of the field trial.

EA holders may propose to use results of rehabilitation trials from other similar or neighbouring sites where:

A. both the waste material and cover construction material is demonstrated to have the same chemical and physical characteristics; and

B. the trial location is representative of the same land/soil types and weather characteristics

Proponents are encouraged to commence trials early in the mine life and identify opportunities to work together across mine sites to collaborate on research trials.

The following information must be documented to support the use of results from any trials:

- chemical and physical properties of material contained in the landform demonstrating it is representative of the mine waste
- chemical and physical properties of all cover materials
- surface and sub-surface preparation requirements including the base/lining layer under the landform (for example, ripping, compacting, establishing bunds)

- amelioration requirements (for example, gypsum/lime etc, rate, spreading/layer application)
- details of installation methodology
- monitoring equipment installation
- QA and QC tests and processes implemented for the construction of each layer of the alternate cover system
- landform evolution modelling undertaken as part of the trial design and calibration of the model after the trial with on-ground climate and erosion measurements.

Following completion of trial planning, a planning report must be submitted to the administering authority that provides details as relevant for the matters above and also provides the following:

- specific objectives of the proposed design cover (i.e. reduction in surface water infiltration to a specified rate, prevention of salt rise that would impact on the establishment of vegetation)
- detailed design
- justification for the quality control and assurance processes that will be implemented for the construction of each layer of the alternate cover system
- lab-based material characterisation results.

At a minimum, the following information must be collected during the course of the trial:

- Monitoring as per Section 8, INAP Global Cover System guideline (INAP 2017)
- Site specific climate data collected for the duration of the trial
- Data relating to surface conditions (biological and erosion monitoring)
- Data from in situ monitoring for:
    - contaminant transport
    - drainage performance
    - evapotranspiration
    - soil performance
    - stability and biological factors.

Following completion of the trial and once minimum time and weather condition requirements have been met (see points 1 and 2 above), a completion report incorporating supporting data must accompany any relevant ERC application proposing the alternative cover system and demonstrating the performance of the alternate cover system against the cover systems set out in the guideline. This report must provide details of the matters described above, in addition to the following:

- Demonstration that the alternate cover system will achieve a stable condition (pursuant to section 111A of the EP Act) and comply with conditions of the EA or criteria specified in the PRCP schedule.
- Calibration processes for all instrumentation.
- SILO data for the duration of the trial period.
- As constructed plans and report by an appropriately qualified person certifying that the alternate cover system was constructed according to the design in the trial planning report.
- Destructive/non-destructive testing of each capping layer in the trial plot.
- Assessment by an appropriately qualified person based on the trial findings that the proposed cover system is able to sustain the proposed post mine land use.
- In situ QA and QC test report for each capping layer.
- QA and QC information for the overall landform construction.
- Independent* certification from an appropriately qualified third party for consideration of full scale application, including findings from the trial and necessary changes.

* Independent to the person/s who designed and installed the alternate capping system.

Pre-lodgement engagement with the administering authority prior to commencing alternative cover system field trials is essential.

Where the ERC calculator is used to calculate the cost estimate for an alternate proposed capping system, the built-up rate must include values for all provisions. If any data is missing the rate cannot be accepted and the application may not be validated. Costings for an alternative cover system may also be supported by a third-party quote in accordance with section 2.2.1 (d) of this guideline.