

**QHSMS Appendix 1****Risk Assessment Guidance**

This document provides a model for potential use in support of the Quarry Health and Safety Management System

– view at [www.quarrysafe.co.uk](http://www.quarrysafe.co.uk).

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## INTRODUCTION

In the United Kingdom, the law requires that:

(1) Every employer shall make a suitable and sufficient assessment of —

(a) the risks to the health and safety of his employees to which they are exposed whilst they are at work; and

(b) the risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking, for the purpose of identifying the measures he needs to take to comply with the requirements and prohibitions imposed upon him by or under the relevant statutory provisions.

(2) Every self-employed person shall make a suitable and sufficient assessment of —

(a) the risks to his own health and safety to which he is exposed whilst he is at work; and

(b) the risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking, for the purpose of identifying the measures he needs to take to comply with the requirements and prohibitions imposed upon him by or under the relevant statutory provisions.

(3) Any assessment such as is referred to in paragraph (1) or (2) shall be reviewed by the employer or self-employed person who made it if —

(a) there is reason to suspect that it is no longer valid; or

(b) there has been a significant change in the matters to which it relates;

and where as a result of any such review changes to an assessment are required, the employer or self-employed person concerned shall make them.

(4) Where the employer employs five or more employees, he shall record —

(a) the significant findings of the assessment; and

(b) any group of his employees identified by it as being especially at risk.

(‘he’ = ‘he/she’)

Management of Health and Safety Regulations 1999

### General:

Risk assessment should not be undertaken simply because it is a statutory requirement. Thinking through the risks in a job and ensuring that these are kept to a minimum is common sense. Experience suggests that risk assessment procedures adopted by companies can often be perceived as complicated and hence become a deterrent rather than an enabler of effective health and safety management. This may also result in risk assessment being considered to be a management function to cover legal enquiries, rather than the exercise of sense and employee involvement in planning the approach to work that it should be.

This document provides a straightforward qualitative assessment of hazards that should cover most working situations. The risk matrix is simple and should be useful in group discussions, including for complex situations such as more than one activity being carried out in one place, needing several perspectives. **It shall be noted, however, that design activities, such as geotechnical design or the design of processing plant, are likely to require more specialised analysis of risk than that provided in this procedure.**

Risk assessments shall be numbered and the current issue identified. The user may wish to adapt the content of these forms in order to keep the records in an electronic database, but must consider the issues of availability, reliability, traceability to those involved and practicality in the field as well as ensuring that a comprehensive process is followed.

It should never be assumed that everything is acceptable simply because training and experience are in place, as many serious injuries have been associated with shortcuts taken by experienced people. The management shall use their best judgement in monitoring good practice and any indication that safe procedure is not being followed shall result in corrective action, with the sanction of the individual concerned being removed from the work.

As far as is practicable, all of the people who will be doing the work shall take part in the risk assessment procedure. The use of white boards or flip charts is encouraged, ideally in the place of work concerned, followed by transcription of the refined outcomes to the documentation. Where this is not possible or where new people join the work later, all people who were not directly involved shall be fully informed and given the opportunity to discuss and to raise issues, so that full understanding is achieved.

### Senior Management Responsibilities:

Remember that responsibilities for OH&S cannot be delegated. It is only the performance or carrying out of responsibilities that can be delegated. The detailed assessments of risks are likely to be supervised by line or site managers, but senior managers have a clear responsibility to ensure that a comprehensive programme of risk assessment and control has been undertaken and that assessments are reviewed at regular intervals. The principle of risk assessment may also be useful as part of a strategic overview of the environment in which the company operates. The matrix provided below has been kept simple so as to enable use as a group-working tool and may, with preparation, be usefully applied to areas such as economic, social or political impact upon a company.

### Site and Process Review:

While detailed application of risk assessment procedures takes place around specific activities or places, it is essential that risk management includes an overview of the complete operation, so that nothing is overlooked. For example, a quarrying operation is likely to include extraction activities in the pit area, processing activities, on-site vehicles and machinery, related plant (sometimes separately managed) such as asphalt or concrete, maintenance activities, the condition of faces, benches, tips, stockpiles, lagoons, roadways, bunds, edge protection, contractor induction, general safety for people on the site and the public nearby and perhaps some off-site activities such as transportation. A 'process map' of activities and an actual map of the site should provide the starting point for a comprehensive review.

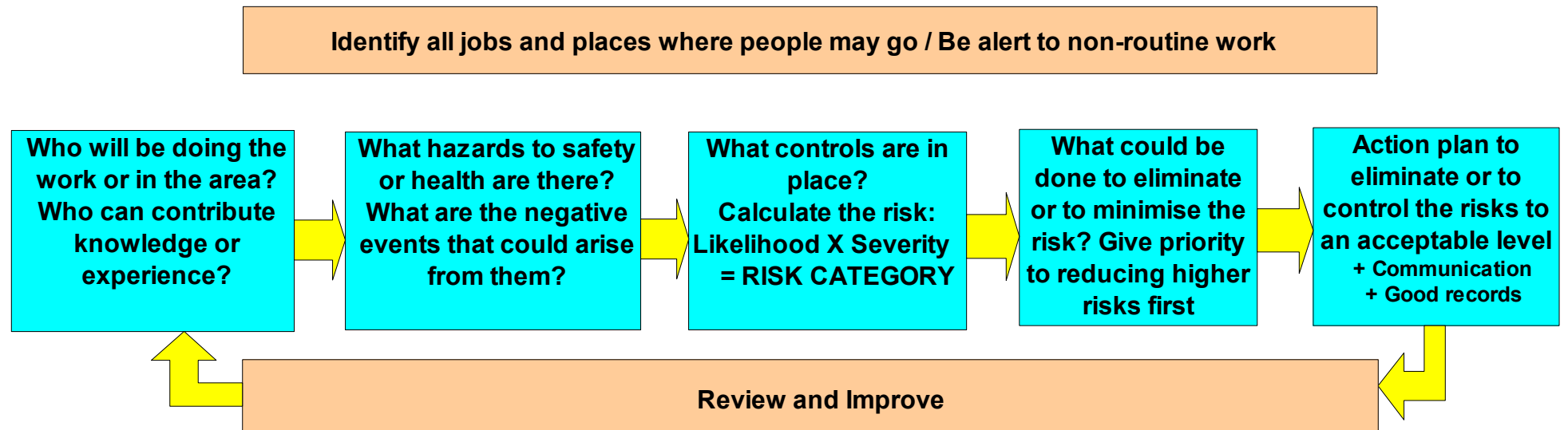
### Non-Routine Jobs:

As many activities as possible should be anticipated in advance, but there will always be occasions where other needs arise. Such work shall be subject to equally rigorous assessment of risk.

### Contractors:

Contractors should have their own risk assessment procedure. This shall be fully checked for suitability and their risk assessments considered in the context of the site before work commences.

### OVERVIEW OF THE RISK MANAGEMENT PROCESS



**Form 1 DETAILS OF THE RISK ASSESSMENT** - To be used with forms 2, 3 and 4

<b>WORK SITE ADDRESS</b>	<b>RA REFERENCE NUMBER:</b>
	<b>ISSUE:</b>
<b>ACTIVITY / AREA(S) / TOPIC / OPERATION TO BE ASSESSED:</b>  <b>LOCATION(S) AFFECTED:</b>  <b>PERSONS / PLANT / ENVIRONMENT / PROCESS AT RISK:</b>	<b>DATE:</b>
	<b>NAME OF RESPONSIBLE MANAGER:</b>
	<b>JOB TITLE:</b>
	<b>SIGNATURE:</b> (BLOCK CAPITALS)  This manager must sign off all pages of the completed assessment as fit for purpose
	<b>REASON FOR THIS REVIEW:</b>
<b>ROUTINE / NON-ROUTINE</b> (Delete as appropriate)	
WRITE CLEARLY IN BLOCK CAPITALS. ATTACH ALL COMPLETED FORMS 2 / 3 / 4 FOR THIS ASSESSMENT AND ENSURE THAT ALL FORMS HAVE THE REFERENCE NUMBER, ISSUE, SIGNATURE, DATE AND PAGE NUMBERS: Page 1 of .....	

<b>Form 2 RISK ANALYSIS</b>		RA Ref No:	ISSUE:	SIGNED:	DATE: / /
Names/Jobs of contributors to this risk assessment <i>(Who will be doing the work or in the area? Who can offer knowledge or experience?)</i>	What hazards are there in the work or the place? <i>(Hazard: Potential to cause harm)</i>	Risk H/M/L - from Form 4	What new / improved controls or 'refreshing' activity could be put into place to reduce risks to an acceptable level? <i>(Can hazards be eliminated at source?)</i>		
	Transcribe to Form 4 to list consequences and existing control measures and to quantify the RISK		Use Form 3 to plan actions to be taken to eliminate risks or to reduce them to an acceptable level		
WRITE CLEARLY IN BLOCK CAPITALS. USE MORE THAN ONE SHEET IF REQUIRED. NOTATE PAGE NUMBERS: Page ....of .....					

<b>Form 3 RISK CONTROL ACTION PLAN</b>				
RA Ref No:	ISSUE:	SIGNED:	DATE: / /	
Action Plan to eliminate or to control the identified risks				
ACTION	OWNER	TARGET DATE	REPORTING METHOD	CONFIRMED COMPLETE (Signature and Date)
WRITE CLEARLY IN BLOCK CAPITALS. USE MORE THAN ONE SHEET IF REQUIRED. NOTATE PAGE NUMBERS: Page ....of .....				

<b>Form 4 RISK EVALUATION</b>		RA Ref No:	ISSUE:	SIGNED:	DATE: / /	
DESCRIPTION OF THE HAZARD (Potential to cause harm)	CONSEQUENCE (Injury type or health impact)	SEVERITY 1 / 2 / 3	EXISTING CONTROL MEASURES		LIKELIHOOD 1 / 2 / 3	RISK H M L
<p><b>Use the descriptions of SEVERITY and LIKELIHOOD given in the guidance to allocate numerical values, so that the prioritising of RISK is based upon a consistent weighting process</b></p>						
<p>ONCE COMPLETED, RETURN TO FORM 2, NOTE THE RISKS (H,M,L) AND LIST POSSIBLE SOLUTIONS TO MITIGATE RISKS</p>						
<p>WRITE CLEARLY IN BLOCK CAPITALS. USE MORE THAN ONE SHEET IF REQUIRED. NOTATE PAGE NUMBERS: Page ....of .....</p>						

<b>RISK ASSESSMENT REGISTER</b> Site / Operation:				
<b>Number / Issue</b>	<b>Issue superseded (Date)</b>	<b>OPERATION / ACTIVITY / AREA ASSESSED</b>	<b>LOCATION(S)</b>	<b>AUTHORISING MANAGER</b>
<b>RA Ref No:</b> <b>Issue No:</b>				<b>Name/Job Title/Date completed:</b>
<b>RA Ref No:</b> <b>Issue No:</b>				<b>Name/Job Title/Date completed:</b>
<b>RA Ref No:</b> <b>Issue No:</b>				<b>Name/Job Title/Date completed:</b>
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<b>RA Ref No:</b> <b>Issue No:</b>				<b>Name/Job Title/Date completed:</b>
When a new issue of an existing assessment is produced, remember to mark the 'Issue superseded' date against the previous issue				
WRITE CLEARLY IN BLOCK CAPITALS. USE FURTHER SHEETS AS REQUIRED. NOTATE PAGE NUMBERS: Page ....of .....				

## GUIDANCE FOR THE USE OF THE FORMS

### **Who will be doing the work or in the area? Who can offer knowledge or experience? (Form 2)**

Try to include people from different shifts or who will be working nearby. If it is not possible to involve everyone who will be in or close to the work, machine or area being assessed, ensure that all such people are fully informed before work starts. Bring in people with relevant knowledge or experience or who have the required authority to achieve the best outcomes. Remember that specialist input may be needed for health hazards.

### **What hazards to safety or health are there in the work or the place? (Form 2)**

Try to engage people in thinking of this from as many different viewpoints as possible –

The work / The people / The place / Machines, equipment, tools / Chemicals / Skills / Procedures / Nearby activities

TAKE SOME TIME TO THINK OF EVERYTHING.

### **What negative consequences could arise from the hazards? How severe would the impact be on safety or health? (Form 4)**

e.g. Electrical events, falling rock, ground collapse, moving machinery, vehicles, malfunction of jacks or other support, dangerous substances, drowning, falling, crushing, choking, explosion, tools or other items dropped from height, chemical burns, poisoning, eyesight damage, hearing damage, dust-related disease, vibration effects, posture, skin disease. *THINK LATERALLY – WHAT COULD POSSIBLY HAPPEN?*

### **What control measures are in place? How likely are these negative consequences to occur? What is the RISK? (Form 4)**

See further guidance below

### **What more could be done to eliminate the risk or to reduce the risk to an acceptable level? (Form 2)**

e.g. Reminders, mandatory qualifications, experience, guidance, formal training, working procedure, lock-off procedure, permit to work, flow-chart, two persons always present, toolbox talks, contractor induction information, posters, stick-on notices, yellow paint, barriers, fences, gates, warning lights, no entry, machine guards, slope or face stability, netting, area layout, CCTV, traffic management, maintenance checklists & schedules, lighting, cleaning, hygiene, housekeeping, ergonomics, new tools or equipment, personal protective equipment. *THINK CREATIVELY! INVOLVE PEOPLE!*

### **Plan to eliminate or to control the identified risks to an acceptable level (Form 3)**

What needs to be done? Who needs to know? What do they need to know? Who holds the budget? Who will do what by when?

*PRIORITISE PLAN GIVE OWNERSHIP DEFINE TIMESCALES DO IT! CHECK IT'S DONE KEEP GOOD RECORDS REVIEW*

### **RATING GUIDANCE (Form 4)**

Form 4 provides a format for evaluating risk by numerically rating the potential severity of the outcome if a hazard should actually cause harm and the likelihood of such an event occurring. Such an approach is very common in risk assessment. The form shall be used with the matrix and guidance that follows. This version has been kept as simple as possible so as to encourage use where such evaluation is justified and to enable use in a group setting.

The ratings descriptors provide a guide to the 1 – 3 ratings, which are then applied to the risk matrix and the severity rating multiplied by the likelihood rating to categorise the risk as High, Medium or Low.

In order to extend the usefulness of this procedure, the ratings descriptors include hazards to the environment and product quality, thus matching the requirements of an integrated management system. This is simply to provide a useful tool and does not imply, for example, that the company considers a serious quality issue to be as significant as a serious injury.

The matrix may potentially have a greater usefulness as a group assessment tool at a strategic level. Following the Turnbull Report (1999), it is incumbent upon companies listed in the UK to identify, assess, record and manage their significant risks in a suitable manner, together with systems for regular review and amendment of controls<sup>1</sup>. With specialist preparation of rating guidance for impacts in areas such as economic, social or political change upon markets, supply streams, etc., a simple risk matrix such as this could be used to obtain group consensus.

<sup>1</sup> Turnbull Report (1999); Internal Control – Guidance for Directors on the Combined Code; Institute of Chartered Accountants in England and Wales; London.

<b>SEVERITY RATINGS</b>			
<b>Numerical Rating</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Descriptive Rating</b>	<b>HIGH</b>	<b>MEDIUM</b>	<b>LOW</b>
<b>PEOPLE</b>	May result in death, very severe injury, disability, debilitating disease.	May result in injury or disease leading to time off work. Contestable compensation claims.	Minor injury requiring first aid
<b>COMMUNITY</b>	One or more severe injuries	One or more minor injuries. Damage to property. Claims.	Complaint from the public
<b>ENVIRONMENT</b>	Significant release with serious off-site impact, either short-term or long-term.  National or international pressure damaging business.	Significant release with some off-site impact. Agency notification or permit violation. Local or national public and media attention.	Environmentally recordable event with no agency notification or permit violation.  Little or no public reaction.
<b>QUALITY</b>	Severe customer complaint leading to claim for consequential loss or potentially damaging publicity.  Delivery of product grossly out of specification.  Serious failure to deliver product to contracted times.  Major increase in rework or rejects and hence significant cost.  Major non-conformity within the process threatening production.	Some disruption to the customer. Possibility of customer seeking recompense.  Process failure leading to some non-conforming product.  Some increase in rework or rejects.  Audit non-conformities.	Potential to cause customer concern.  Potential non-conformities within the process – internal concern.  Audit observations.

<b>LIKELIHOOD RATINGS</b>			
<b>Numerical Rating</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Descriptive Rating</b>	<b>HIGH</b>	<b>MEDIUM</b>	<b>LOW</b>
	Very likely to occur.  Could be imminent or frequent.	Likely to occur at some time.  Occasional events that are known to be associated with the work or the place.	Rarely or never known to have occurred in the past but conceivable in this situation.

For certain situations, such as where hazards are controlled by the use of protective measures (e.g. seat belts in vehicles; face masks in high silica dust environments), it is advisable to consider the 'likelihood' of a negative event as taking into account the likelihood of people not having followed these procedures rather than assuming that all such controls are effective because instructions are in place. This will avoid complacency and hence lead to active 'refreshment' of the controls as part of the action plan. Work cultures vary, in that confidence may be higher regarding such compliance in some sites than in others.

It is recommended that actual data be referred to where it can be obtained to support the likelihood ratings. For example, a decision to give a rating of 2 rather than 3 for the likelihood of rocks falling on to a particular roadway would be more effective if supported by records or statements that show the event only to have occurred once or twice in comparable situations over a long period of time.

**Apply the numerical ratings to the following RISK MATRIX to help to prioritise the RISK**

### Risk Matrix

↑ Likelihood	High (3)	3 Medium	6 High	9 High
	Medium (2)	2 Low	4 Medium	6 High
	Low (1)	1 Low	2 Low	3 Medium
		Low (1)	Medium (2)	High (3)
		Severity →		

**6 – 9 High Risk**

**Top priority – deal immediately and effectively**

**3 – 5 Medium Risk**

**Lesser priority – deal as quickly as possible**

**1 – 2 Low Risk**

**Lowest priority – review for straightforward actions**

## **RISK CONTROL**

In the UK, the law requires that the following general principles of prevention be followed:

- (a) avoiding risks;
- (b) evaluating the risks which cannot be avoided;
- (c) combating the risks at source;
- (d) adapting the work to the individual, especially as regards the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work-rate and to reducing their effect on health;
- (e) adapting to technical progress;
- (f) replacing the dangerous by the non-dangerous or the less dangerous;
- (g) developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors relating to the working environment;
- (h) giving collective protective measures priority over individual protective measures; and
- (i) giving appropriate instructions to employees.

Management of Health and Safety Regulations 1999

Risk control is the really important part of risk management. The following questions should be asked:

- ◆ Is the activity that creates this hazard completely necessary? Is there any way of avoiding it by using a lower risk approach?
- ◆ Are there root causes that may be addressed? For example, by replacing or improving unsafe equipment rather than by relying upon warning signs and personal protective equipment.
- ◆ Has the importance of people been considered fully in the design of workplaces and work procedures?
- ◆ Will people really take hold of the control measures and make them effective?

High risks shall be reduced immediately to an acceptable level by improvement to controls, e.g. safe and healthy working procedures, assurance of competence, barriers, machine guards, rock face stabilisation, permit-to-work, lock-off, personal protective equipment.

***Work shall not commence or continue while a high risk exists.***

Medium risks shall next be dealt with to reduce them to an acceptable level. Constant vigilance is required. E.g. if death is perceived as possible due to entanglement in machinery (severity 3) although this has never been known to happen in the company (likelihood 1), complacency could still increase the risk as there remains the possibility of carelessness in haste to complete a job, a new employee with lower initial competence, a guard working loose or other negative effects.

Low risks shall be considered for possible simple improvement to or reinforcement of controls. For example, if a risk of minor laceration by a sharp cutting-edge (severity 1) has been rated as low as it has never occurred (likelihood 1), it is still worth reminding people that such items must be properly kept and handled in order to maintain this safe situation. The formal enactment of a risk review can provide an opportunity to remind experienced people of simple precautions without this seeming patronising.

***Ultimately, the evaluation process is simply a guide to priorities and the 'acceptable level' for risk control is a matter for professional and humane judgement, following the 'as low as reasonably practicable' principle that would provide the basis for any subsequent legal argument.***

### Risk Control specified in the Quarry Regulations:

Within the above framework of systematically assessed and controlled risks that applies by law to any industry, the UK quarrying industry has a particular legal obligation to apply specific risk controls as follows:

- ◆ Written procedures for the inspection, maintenance and, where appropriate, testing of all parts of the quarry and of all buildings and plant at the quarry, providing reports of significant defects with steps taken to remedy them. These reports shall be signed by the person making the inspection and countersigned by an appropriate manager. The company shall ensure that a sufficient number of competent persons are available for such work. (e.g. vehicles, guards, safety devices, electrical equipment, pressure vessels, pedestrian routes, excavations, tips)
- ◆ Such inspection specifically includes inspection of faces above places of work and roadways for loose rock or loose ground before any work commences or recommences.
- ◆ Safe design, construction and maintenance of benches and haul roads (and other traffic routes) for the movement of vehicles and plant.
- ◆ Precautions to prevent vehicles or plant accidentally leaving benches or haul roads (e.g. effective edge protection).
- ◆ Written rules for vehicle-related safety (e.g. driver competence, vehicle security, use restrictions, speed limits, seat belts).
- ◆ Provision and maintenance of adequate means of escape and rescue for people to leave the quarry in the event of danger, together with means of communication and warning to enable immediate launch of such operations.
- ◆ Trained personnel for emergencies, written instructions on action to be taken and the use of emergency equipment and accessible, appropriately sited and sign-posted rescue equipment.
- ◆ Properly maintained barriers around the boundary of the quarry that are suitable for discouraging trespass.

Summarised from the Quarry Regulations 1999