
Examiners' Report

UNIT ED1: MANAGING ENVIRONMENTAL RISK

JANUARY 2018



For: **NEBOSH National Diploma in Environmental Management**
NEBOSH International Diploma in Environmental Management

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Introduction

NEBOSH (The National Examination Board in Occupational Safety and Health) was formed in 1979 as an independent examining board and awarding body with charitable status. We offer a comprehensive range of globally-recognised, vocationally-related qualifications designed to meet the health, safety, environmental and risk management needs of all places of work in both the private and public sectors.

Courses leading to NEBOSH qualifications attract around 50,000 candidates annually and are offered by over 600 course providers, with examinations taken in over 120 countries around the world. Our qualifications are recognised by the relevant professional membership bodies including the Institution of Occupational Safety and Health (IOSH) and the International Institute of Risk and Safety Management (IIRSM).

NEBOSH is an awarding body that applies best practice setting, assessment and marking and applies to Scottish Qualifications Authority (SQA) Accreditation regulatory requirements.

This report provides guidance for candidates and course providers for use in preparation for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content and the application of assessment criteria.

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General comments

Many candidates are well prepared for this unit assessment and provide comprehensive and relevant answers in response to the demands of the question paper. This includes the ability to demonstrate understanding of knowledge by applying it to workplace situations.

There are other candidates, however, who appear to be unprepared for the unit assessment and who show both a lack of knowledge of the syllabus content and a lack of understanding of how key concepts should be applied to workplace situations.

This report has been prepared to provide feedback on the standard date examination sitting in January 2018 and covers both the 2010 specification for the National Diploma in Environmental Management, and the 2016 specification for both the National Diploma in Environmental Management and the International Diploma in Environmental Management.

Feedback is presented in these key areas: responses to questions, examination technique and command words and is designed to assist candidates and course providers prepare for future assessments in this unit.

Candidates and course providers will also benefit from use of the 'Guide to the NEBOSH National Diploma in Environmental Management' / the 'Guide to the NEBOSH International Diploma in Environmental Management' which are available via the NEBOSH website. In particular, the guide sets out in detail the syllabus content for ED1 and tutor reference documents for each Element.

Additional guidance on command words is provided in 'Guidance on command words used in learning outcomes and question papers' which is also available via the NEBOSH website.

Unit ED1

Management of environmental risk

Question 1 An organisation has discovered that land at the rear of its factory is contaminated with a wide range of substances, including laboratory waste. Some of the substances are migrating to cause pollution of a nearby stream.

Identify remediation techniques that could be used. **(20)**

This question assessed candidates' knowledge and understanding of learning outcomes 14.2: Identify hazards and assess risks associated with contamination of soil and groundwater and advise management on the options for remedial treatment (2010 syllabus specification) and 11.3: Outline the hazards with contamination of soil and groundwater and the options for remediation (2016 syllabus specification).

This question required candidates to identify suitable remediation techniques that could be used in a situation where land was contaminated, with a range of different substances, and there was known receptor (the stream). Answers were generally limited with many candidates gaining only a small number of marks. Better answers included reference to a range of techniques that can be applied to the treatment at source, limiting movement through pathways and protection of the identified receptor. However, many candidates only identified a small number of relevant techniques, such as excavation to remove the source or treatment of the stream using booms. This suggests that candidates' knowledge of the topic was limited.

Some candidates appeared not to have read or understood the question and digressed into matters that were not required, such as providing descriptions of legal issues arising from land contamination, notification to regulators or requirements applying to the management and transfer of wastes produced during remedial works.

Many answers provided detailed descriptions of remedial techniques, rather than simply identifying them. Candidates should appreciate that the marks available are proportionate to the requirements of the command word and no additional marks are gained by going beyond what the command word requires. Course providers are encouraged to draw candidates' attention to the NEBOSH guidance on command words.

Question 2 A manufacturing process generates large amounts of dust.

(a) **Outline** what should be considered in the selection of suitable dust control options for this process. **(8)**

(b) **Give FOUR** examples of dust control devices that could be used **AND describe** how **EACH** removes particulates from air. **(12)**

This question assessed candidates' knowledge and understanding of learning outcomes 10.4 (2010 syllabus specification) and 8.3 (2016 syllabus specification) Describe appropriate control strategies and measures for releases to atmosphere.

Responses to this question were generally good. Most answers to part (a) considered both the properties of the dust produced (such as particle size or combustibility), and the properties of a control device (such as cost and removal efficiency). Few answers covered practical considerations such as the physical size of the device in relation to space available.

Many candidates gained very good marks on part (b) of the question by including suitable devices such as cyclones, bag filters, and electrostatic precipitators, with a description of how the devices work.

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- Question 3** An organisation has an environmental management system, certified to ISO 14001, and a separate health and safety management system in place. Senior management wants to introduce a formal quality management system and is considering integrating the three systems.
- (a) **Explain** potential benefits of integration. **(10)**
- (b) **Explain** potential limitations of integration. **(10)**
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This question assessed candidates' knowledge and understanding of learning outcomes 3.2: Explain a systematic approach to environmental risk management (2010 syllabus specification) and 3.1: Explain the purpose, benefits, limitations and structure of an environmental management system (2016 syllabus specification).

Some candidates who attempted this question seemed to find it challenging. Most answers to part (a) covered benefits such as reduced costs of administration in a combined system; some candidates also gained marks for explanations of benefits arising from unified procedures. Few candidates went further and addressed broader issues like simpler reporting to senior management.

Candidates had more difficulty with part (b) of the question. Many answers covered the complex process involved in integration, as well as potential competency issues. However, few candidates went beyond these to consider that combining management systems may not be suitable based on the requirements of an organisation.

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- Question 4** (a) **Identify** environmental considerations relating to the *location* of a potential new landfill site. **(8)**
- (b) **Identify** issues that should be addressed in the proper management of the landfill site once it is in operation. **(12)**
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This question assessed candidates' knowledge and understanding of learning outcomes 9.5: Identify appropriate control strategies and measures for solid and liquid waste (2010 syllabus specification) and 7.4: Outline appropriate control strategies and measures for solid waste (2016 syllabus specification).

Many candidates gained high marks for this question. However, some candidates did not respond to the command word, giving lengthy descriptions in their answers to both parts for which no extra marks were available. Course providers are encouraged to draw candidates' attention to the NEBOSH guidance on command words.

For part (a) many candidates identified a broad list of relevant environmental considerations, such as proximity to residential areas or important wildlife sites. Answers to part (b) were also generally good, with many of the relevant management issues being identified, such as record keeping requirements, site security or odour control.

Question 5 **Outline** appropriate indicators that may reflect an organisation's environmental management performance. **(20)**

This question assessed candidates' knowledge and understanding of learning outcomes 4.1: Describe appropriate indicators that may reflect an organisation's environmental management performance (2010 syllabus specification) and 5.1: Explain appropriate indicators that may reflect an organisation's environmental management performance (2016 syllabus specification).

This was a popular question with many candidates gaining marks by providing outlines of a range of typical environmental management performance indicators, such as incident/accident frequency, recycling rates and greenhouse gas emissions.

Some candidates wrote about why indicators were important or how performance information can be gathered and assembled. These topics did not answer the question and therefore did not attract additional marks. Candidates should read and re-read a question to help ensure that they address their answers to the relevant topic and respond to the relevant command word.

Question 6

(a) In the context of environmental noise, **outline** the following terms: **(3)**

 (i) 'A' weighting scale; **(3)**

 (ii) percentile sound levels; **(3)**

 (iii) equivalent continuous sound pressure level. **(3)**

(b) **Describe** how the potential for complaint from environmental noise should be assessed. **(11)**

This question assessed candidates' knowledge and understanding of learning outcomes 12.1: Describe the characteristics of noise and advise on measurement and assessment of environmental noise levels (2010 syllabus specification) and 10.1: Explain the characteristics of noise and advise on measurement and assessment of environmental noise levels (2016 syllabus specification).

Answers to part (a) were generally limited. Candidates appeared to be unfamiliar with the three terms and had difficulty in outlining them. Course providers should help ensure that candidates are familiar with the meanings of key terms used in noise measurement.

Answers to part (b) typically gained more marks and candidates appeared to understand how environmental noise is assessed and were able to describe the process. Many candidates chose to follow the stages set out in BS4142:2014, which provided a logical structure to their answers.

Question 7	(a)	Outline what is meant by ‘ <i>cost benefit analysis</i> ’.	(4)
	(b)	Explain how cost benefit analysis is applied in an environmental context.	(16)

This question assessed candidates’ knowledge and understanding of learning outcomes 2.1: Evaluate risks to the environment arising from workplace activities and substances released to the environment (2010 syllabus specification) and 4.3: Explain the techniques for evaluating environmental aspects arising from workplace activities (2016 syllabus specification).

In part (a) most candidates gained some marks by stating that benefits and costs are balanced as a basis for comparing options, with the analysis being expressed as monetary value.

Answers to part (b) were very limited with most candidates gaining only a small number of the available marks. Very few candidates appeared to understand the basic concept of cost benefit analysis and many candidates relied on giving examples. However, candidates had difficulty in relating these examples to the question and did not use them to demonstrate the processes through which environmental costs and benefits are scoped, valued and then expressed and compared.

Question 8	(a)	(i)	Outline the carbon cycle.	(4)
		(ii)	Describe how human activity may cause changes to the carbon cycle.	(6)
	(b)	(i)	Outline the nitrogen cycle.	(4)
		(ii)	Describe how human activity may cause changes to the nitrogen cycle.	(6)

This question assessed candidates’ knowledge and understanding of learning outcomes 1.1: Explain the earth’s natural cycles and how the principles of sustainability are being adopted (2010 syllabus specification), 1.3: Explain the principles of environmental hazard identification, risk assessment, and risk control (2010 syllabus specification), 1.1: Explain the meaning of the environment and the earth’s key natural cycles (2016 syllabus specification) and 1.2: Explain the general effects that human activity has on the environment (2016 syllabus specification).

Part (a) presented few problems for most candidates. Many achieved full or near full marks for part (a) (i) with good outlines of the carbon cycle; many illustrating their answers using simple diagrams to show the links between stages in the cycle. In part (a) (ii), answers were again good, with most candidates relating to different parts of the cycle, describing the addition of carbon to the atmosphere through fossil fuel combustion, as well as reduced removal of carbon from the atmosphere by removal of sinks.

Answers to part (b) (i) were generally good and most candidates clearly understood the basics of the nitrogen cycle. Some candidates did not appreciate the role of atmospheric nitrogen and limited their answers to the stages of the nitrogen cycle within the water environment. Answers to part (b) (ii) were also generally good. However, some candidates addressed the addition of nitrogen to the water environment through such processes as enrichment through use of fertilisers, but missed the role of increasing atmospheric nitrogen, for example through high temperature combustion.

Examination technique

The following examination techniques were identified as the main areas of improvement for candidates:

Candidates did not respond effectively to the command word

A number of candidates do not appear to understand the differences in depth and breadth associated with different command words. In particular 'outline' and 'describe' appear to be poorly understood. Some candidates do not give enough detail when answering this type of question. For example an 'outline' answer should give a brief overview and should not be limited to a simple list.

Conversely questions based on 'identify' or 'outline' can illicit lengthy answers covering several sentences, when in fact short answers would have sufficed. This means that candidates waste time and effort for no additional credit.

Course providers should ensure that candidates understand the importance of command words in determining the depth and breadth of information required in answers.

Candidates misread/misinterpreted question

Examiners reported that a significant number of candidates either misread or misinterpret some of the questions. It appears that those candidates who have difficulty are 'question-spotting', seeing a key word or phrase and answering the question based on that, rather than thoroughly reading the question and answering what was set. Consequently, some candidates produce answers that contain information that is either irrelevant and/or out of context, such as addressing waste and water use minimisation in a question on energy use.

On several questions, candidates extended their answers to cover points outside of the question. This could indicate that they had not thoroughly read the question before attempting it, or that they misinterpreted the question as something similar they had previously seen.

Rather than rushing into an answer, some candidates might improve their performance by producing a short answer plan and then pausing for a few seconds, to confirm in their minds that this is what the question is really asking.

Course providers should ensure that candidates are taught how to read and analyse questions so that they are clear exactly what information is likely to gain marks.

Candidates repeated the same point but in different ways

Candidates occasionally produce several paragraphs that all address the same point but in different ways. This tends to indicate that they have not planned their answers carefully. Examiners can only give marks once. No additional marks will be available for re-stating a point several times.

For example, outlining 'recycling' as a way of reducing disposal costs for waste, but then repeating this several times for different waste types, such as introducing paper recycling in offices or recycling manufacturing waste as different points. Such practice might expand the answer where breadth of knowledge is limited but gains no extra marks. Repetition also wastes precious examination time.

Course providers should encourage candidates to plan their answers in advance of writing to avoid repetition. Candidates should be encouraged to practice examination technique, and in particular structuring answers using a simple plan, so as to ensure that their answers follow a logical structure and avoid covering a topic more than once.

Candidates produced an incoherent answer

Candidates sometimes stray into areas outside the question and waste time and effort in producing confusing answers addressing matters not relevant to the question, such as detailing statutory nuisance on a civil law question.

Candidates should be taught to limit their answers to only the topic detailed in the question.

Candidates did not follow specific instructions

Where a question instructs that a candidate produces an answer in a specified form, such as a brief, marks cannot be awarded if answers are not in the specified form.

Candidates should be taught how to present and structure their answers in common formats, such as a memorandum or a brief.

Command words

The following command words are listed in the order identified as being the most challenging for candidates:

Describe

Describe: To give a detailed written account of the distinctive features of a topic. The account should be factual without any attempt to explain.

Many candidates outline without giving adequate content for a 'describe' question. A typical description should cover more than the outline of the point being made. The command word 'describe' requires that candidates provide distinctive features of the particular syllabus learning outcome being assessed but do not need to provide extensive information on that topic. Candidates occasionally respond to 'describe' by completing a full page of text without actually responding with the distinctive features associated with the question topic. Candidates need to distinguish between 'outline' and 'describe' and not respond with a series of unconnected points generally related to the topic in the question. If a candidate was asked to describe a control strategy aimed at the prevention of environmental pollution, the inclusion of monitoring of airborne concentrations and emissions that include estimates of losses by mass balances would satisfy the command word.

Explain

Explain: To provide an understanding. To make an idea or relationship clear.

When a question specifies 'explain' the candidate is required to provide an understanding or make clear an idea or relationship. For example '**explain** the cradle to grave concept'; if a candidate responded with 'takes into account inputs and outputs, considers environmental costs and uses equivalences; then this constitutes an outline but **not** an explanation. This would be insufficient to merit full marks as this does not provide a deep enough understanding or relationship from the specified command word or the context in which the question is asked. However, if a candidate responded in greater depth, for example 'a life cycle analysis study taking into account an inventory of all inputs and outputs; supply, manufacturing and waste impacts would be taken into account; environmental costs or obstacles would be added in at all stages along the way with interpretation through evaluation of these identified stages and alignment with the scope of the study'; then this would merit the awarding of further marks.

Outline

Outline: To indicate the principal features or different parts of.

An 'outline' requires a brief summary on each point. Examiners report that the command word 'outline' challenges many candidates. Insufficient detail is provided in response to the principal features or parts of the topic matter requested when 'outline' is specified in the question. Exhaustive descriptions are not required for 'outline' but limited answers like single words or listed answers do not satisfy the command word requirements.

If asked to '**outline** the information that should be included in an environmental report following an environmental assessment', significant effects on the environment, including short, medium and long-term effects would be an example of an adequate 'outline' response.

Breadth is important in an outline question. Some candidates give far too much detail for a relatively small number of points. Candidates should be aware that for an outline question, the number of marks available for each distinct point is limited, and no additional marks can be given for lengthy detailed responses.

Identify

Identify: To give a reference to an item, which could be its name or title.

When providing a response to 'identify' the selection and naming of an answer that relates to the question should be sufficient. In most cases one or two words would be sufficient to be awarded corresponding marks. Any further detail would not be required and impacts negatively on the time limit for completing the examination. If the use of the command word in everyday language or conversation was considered it may help the candidate understand what was required. For example, if the question was '**identify** types of kitchen appliances', 'toaster, kettle and microwave' would be suitable responses for the 'identify' command word.

For additional guidance, please see NEBOSH's '*Guidance on command words used in learning outcomes and question papers*' document, which is available on our website: <https://www.nebosh.org.uk/i-am/a-student/> - from this page the document can be found by clicking on the relevant Qualification link, then on the 'Resources' tab.