

Unit title: **Environmental Management and Conservation**

Unit code: **K/601/0289**

Level: **5**

Credit value: **15**

Aim

This unit reviews environmental issues such as conservation sites, recycling and land reclamation. Learners gain an understanding of the causes and effects of pollution, global environmental issues, renewable energy, and the work of environmental pressure groups.

Unit abstract

Learners will have the opportunity to explore environmental issues in their own community. To make the most of this, learners may visit Sites of Special Scientific Interest, recycling facilities, brownfield land that is being reused, and local industry. Learners will investigate the origins and effects of pollutants and study how pollution may be controlled.

Evidence for human impact on global climate change and international initiatives to combat the effects through carbon trading will be explored. The work of environmental pressure groups in bringing environmental issues into the public domain will be investigated.

Finally, learners will study legislation, particularly in relation to waste, in order to gain an understanding of the quality of the information that government provides to business. Case studies will be used to assess the effectiveness of environmental management systems.

Learning outcomes

On successful completion of this unit a learner will:

- 1 Understand the major strategies for conservation of resources
- 2 Understand the causes, effects and the control of pollution
- 3 Understand global environmental issues
- 4 Understand how environmental legislation may be put into practice.

Unit content

1 Understand the major strategies for conservation of resources

Statutory designations: designated areas eg Sites of Special Scientific Interest (SSSI) (biological and geological), Special Areas of Conservation (SAC), Ramsar sites, national and local nature reserves and Marine Protected areas; establishment of designated areas; design of designated areas; development of designated areas; management of designated areas

Processes: guidelines for selection eg geological conservation review, notification, consultation and confirmation with respect to Sites of Special Scientific Interest, identification of SACs in line with Habitats Directive, government approval of SACs, adoption of UK list of SACs by European Union, criteria in Ramsar convention

Resource recycling: recycling eg glass, aluminium, paper, wood, plastic; the strategies employed by local councils; packaging waste regulations eg Producer Responsibility Obligations (Packaging Waste) Regulations 2007; compliance schemes for relevant packaging waste regulations eg Valpak

Land resource management: relevant legislation eg Planning and Compulsory Purchase Act 2004; the role of the spatial planning system in conserving the natural environment and delivering high quality environmentally sustainable development; the technical and management issues in the remediation and use of brownfield land; local authority registers of contaminated land

2 Understand the causes, effects and the control of pollution

Pollutants: common air pollutants eg sulfur oxides (SO_x), nitrogen oxides (NO_x), low level ozone, benzene, 1,3 butadiene, lead, PM10; sources of the common air pollutants eg transport, energy use, manufacturing industry; List 1 aquatic pollutants from the Dangerous Substances Directive; sources of List 1 aquatic pollutants; agricultural aquatic pollutants eg silage run off, nitrates, phosphates, slurry, sheep dip

Effects on organisms within an ecosystem: eutrophication; increase in chemical oxygen demand; effects of sulfur dioxide on vegetation

Current relevant strategies: Environment Act 1995; National Air Quality Strategy; National Air Quality Standards and Objectives; National Atmospheric Emissions Inventory; European Pollutant Emission Register (EPER); Environmental quality standards; river ecosystem classifications bio-monitoring; indicator species; keystone species

Control methods: legislation eg Integrated Pollution Prevention Control (IPPC), The Water (Prevention of Pollution) (Code of Good Agricultural Practice) (England) Order 2009; identification of areas at risk eg Air Quality Management Areas (AQMA), Nitrate Vulnerable Zones; best available techniques; best available techniques reference documents; specific techniques eg flue gas desulfurisation

3 Understand global environmental issues

Climate change: greenhouse gases and their atmospheric effects; economic and social consequences of global warming; global initiatives eg the Kyoto Treaty, Copenhagen Climate Summit; ozone depletion and the Montreal protocol

Carbon trading: EU Emission Trading (ETS) Scheme; Clean Development Mechanism; carbon markets

Energy security: peak oil; biofuels; carbon capture and storage; clean coal; nuclear power, renewable energy sources; energy security; the UK Low Carbon Transition Plan

Pressure groups: national or international eg Friends of the Earth, World Wide Fund for Nature (WWF), Greenpeace

Global campaigns: campaign of topical interest eg carbon footprint, lifecycle analysis, food miles, sustainable transport, saving the rainforests, limiting ozone depletion (Montreal Protocol)

4 Understand how environmental legislation may be put into practice

Legislation: UK/EU eg the Environmental Protection Act 1990, Environmental Permitting Regulations 2007, Environmental Liability Directive, Waste Framework Directive, Batteries Directive

Operation of environmental permitting regulations: managing activities; suitable environmental management system; use of competent persons; accident management plan; permit conditions/rules; waste acceptance; point source emissions to air, water and land; fugitive emissions; odour; noise and vibration; monitoring; records; reporting/notification

Waste management: environmental permitting regime (England and Wales) eg pollution prevention and control, waste management licenses, waste carriers and broker registrations, water discharge consents, groundwater authorisations; waste management duty of care; Pollution Prevention Guidelines

Environmental management systems: structured and documented environmental management systems (EMS) to manage environmental performance and responsibilities; EMS certification, ISO 14001; the EU Eco-Management and Audit Scheme (EMAS); BS 8555 (a British Standard for Small and Medium Enterprises (SMEs))

Learning outcomes and assessment criteria

Learning outcomes On successful completion of this unit a learner will:	Assessment criteria for pass The learner can:
LO1 Understand the major strategies for conservation of resources	1.1 discuss current national and international statutory designations protecting the UK's natural environment 1.2 explain the processes involved in the establishment of a designated area for conservation 1.3 discuss how the UK reduces waste and promotes recycling 1.4 discuss issues involved in land resource management
LO2 Understand the causes, effects and the control of pollution	2.1 discuss pathways of named pollutants from source to receptor 2.2 assess the effects of a named pollutant on organisms within an ecosystem 2.3 discuss strategies used for monitoring pollutants in water and air emissions 2.4 assess methods for controlling pollution
LO3 Understand global environmental issues	3.1 evaluate evidence for the contribution of human activities to climate change 3.2 review international carbon trading 3.3 discuss environmental aspects of the UK's energy security policy 3.4 assess the role of an environmental pressure group in a global environmental campaign
LO4 Understand how environmental legislation may be put into practice	4.1 review current UK/EU/environmental protection legislation 4.2 explain operation of the Environmental Permitting Regulations 4.3 explain how businesses comply with their duty of care for waste management 4.4 assess, using case studies, the effectiveness of using an environmental management system.

Guidance

Links

This unit has particular links with the following units within this qualification:

- *Unit reference number F/601/0220: Analysis of Scientific Data and Information*
- *Unit reference number F/601/0301: Quality Assurance and Quality Control*
- *Unit reference number Y/601/0238: Environmental Monitoring and Analysis*
- *Unit reference number D/601/0239: Ecological Principles and their Application*
- *Unit reference number A/601/0295: Biodiversity, Conservation and Threats*

Essential requirements

Delivery

Current legislation and initiatives are mentioned in the unit content but these must be replaced by suitable alternatives if they become out of date. In all cases the latest legislation must be used. Where possible, learners should visit sites and organisations and the use of visiting speakers is strongly encouraged.

Learning outcome 1 covers Sites of Special Scientific Interest, recycling and waste minimisation and reclamation of brownfield land. Ideally, learners should visit a Site of Special Scientific Interest, a brownfield site that is being put to a new use and a council recycling facility. Input from experts at the site will deepen learner understanding. If this is not possible, learners must be encouraged to find out about relevant sites in their area.

Learning outcome 2 has a particularly wide scope, which has been limited to consideration of air and water (and not land). It could be delivered by introducing the general content and then focusing on issues of particular relevance to the centre's location. Centres in a predominantly rural area, for example, may wish to concentrate on aquatic agricultural pollution, such as nitrate pollution. Other centres in industrial areas may choose to consider the effects of sulfur dioxide in great detail.

For learning outcome 3, there is a great deal of information about global warming available. One strategy would be to select a number of documents from a variety of sources for learners to study. This would allow them to evaluate the information in the evidence, and also the quality of the evidence, and to decide whether they would need more/different evidence to be able to draw firm conclusions. Possible strategies for the UK's energy security policy must be discussed and the Government's preferred options identified. The environmental implications of alternative forms of energy must be explored. This could involve analysis of numerical data.

Learning outcome 4 gives learners the chance to explore the value of Netregs, the government website dealing with environmental legislation. This will support the first three assessment criteria.

Assessment

For learning outcome 1, learners may look at current national and international statutory designations protecting the UK's natural environment in general but go into more depth to address the unit content in relation to the processes involved in setting up one of these sites. Where possible, learners should visit a local site. Learners must address the unit content in outlining the reclamation of brownfield land, using a local case study where possible.

For learning outcome 2, the focus needs to be limited to allow learners to gain a depth of understanding. Particular pollutants need to be selected with reference to the pathways from source to receptor. Pollutants need to be chosen carefully in order to be relevant and to allow learners to select good quality information. In discussing strategies used for monitoring pollutants, emphasis must be on the overview of data taken by Government agencies and local authorities, rather than on specific analytical techniques. Methods of controlling one or more pollutants must be covered. This must involve specific pollution abatement techniques and also the supporting legislation. Once again, the focus could be different, for example industrial or agricultural.

For learning outcome 3, learners could source articles about global warming. They could assess the quality of the articles, the quality of the evidence and identify further desirable work in this area. Learners must review the nature and extent of international carbon trading. Government information on future energy supplies is available. The focus is not only on the nature of the energy security policy but the implications for the environment. Learners must identify a high profile global campaign, which a pressure group is/has been involved with and assess the role of the pressure group in that campaign.

Learning outcome 4 gives learners scope to present material on legislation that they have obtained from Netregs or other sources. Learners must assess the features of an environmental management system and how it operates. Additionally, case study information from industry is required about the effectiveness of using an environmental management system. ISO 14000 is the most common environmental management system. However, learners may write about the effectiveness of others if they have suitable industrial input.

Resources

Learners must have access to real case studies and/or real-life situations. Access to current legislation and initiatives is also essential.

Employer engagement and vocational contexts

Learners would benefit from visiting Sites of Special Scientific Interest, recycling facilities and reclaimed land. The causes, effects and control of pollution may be assessed in a local context. It is essential to have industrial input to assess the effectiveness of using an environmental standard. Guest speakers from industry and other groups would enhance delivery.